Designing with Nature, UP UR C 21 Basics

Condensed from the manuscripts in Genesis Nursery's
Informational CD, Designing with Nature, UP UR C 21

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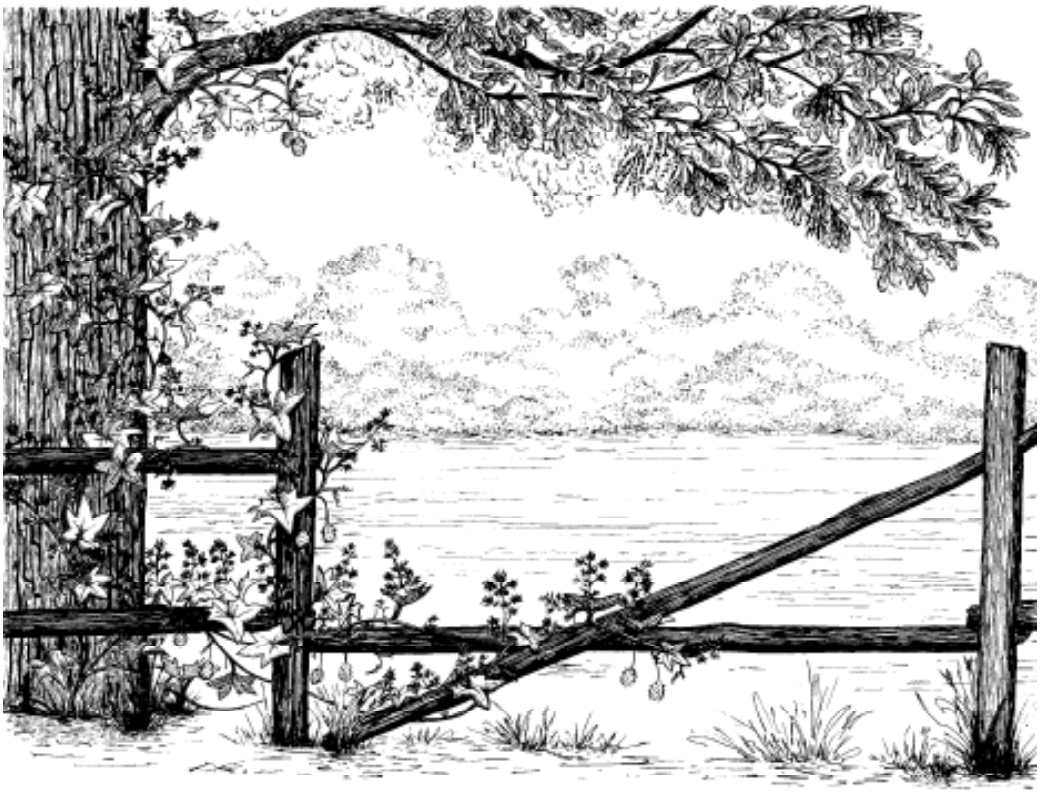


INTRODUCTION

The following information is a product of nursery operations and customer service at Genesis Nursery, Inc. It is privately produced and distributed. The plants are arranged alphabetically by family, and alphabetically by genus within the family, then by species alphabetically. The information is organized as follows:

FAMILY
GENUS origin of genus name, comments.
Botanical name authors name [forth-coming name changes] COMMON NAME aka more common names, origin or translation of the species name. Immediately after some species names there is an asterisk and a state abbreviation following the botanical name. This indicates the species is a listed species in that state (or noxious weed).
Habitat: Habitats and distribution.
Culture: Cultural suggestions and published and/or recommended seeding rates when known.
Description: Descriptions (including flower color, height, some species more descriptive than others).
Comments: Comments including status, flowering period, uses, multiple seed counts, and with a source when available, and erratta. Ripening times and harvest dates, seasonal commercial availability, storage characteristics, and shelf life are being added.
Associates: Associates lists interactions with other organisms.

Additional species information is available on the CD, Designing with Nature, UP UR C21.

Botanical nomenclature is somewhat after Swink and Wilhelm, 1994, with influence from Mohlenbrock and Gleason and Cronquist, the Flora of North America, and Weakley (2008). We use a taxonomy that accomodates our clients projects.

We do not include numerical coefficients in the species list. As Edward Abbey says, "anything reduced to numbers and algebra is not very interesting." (Down the River)

Some of them will saye, seeing that I graunte that I have gathered this booke of so many writers, that I offer unto you a heape of other mennis laboures, and nothing of mine own … To whom I answere that if the honye that the bees gather out of so many floure of herbes, shrubbes, and trees, that are growing in other mennes

meadowes, feldes, and closes may justelye be called the bee's honye … so maye I call that I have learned and gathered of so many good autores … my booke.

William Turner, 1551, Suggested by A. W. Anderson in *The Coming of the Flowers*, from Jones and Fuller, 1955.

The following information contains basic data relevant to establishing native plants in the landscape. Those writing native landscape and restoration projects have an obligation to write the most accurate, the most potentially successful specifications possible. This industry is now and has historically been based on dry stored seed installed without artificial moist stratification. The writers of projects must be familiar with the horticultural needs of the native species they are using in order to write effective, economical projects. Designers need to use materials that will flourish in the context of the project and the timing of the seeding. If the industry continues to ignore the basics, it will be doomed to still more mediocre or failed projects. Filling job specifications with fluent legalese does not make a successful planting, knowing the natives does.

Plants that are listed here are available in some form from a Midwest source. A responsible project designer will verify availability in any given year from multiple sources before using any species in a project.

Alphabetical List of Species

ACANTHACEAE Durende 1762 **Acanthus Family** From the type genus *Acantha Greek* ἀκανθα, spine, thorn, prickle.

JUSTICIA Linnaeus *Acanthaceae Justicia* New Latin, from James Justice, 1698-1763, Scottish horticulturist and botanist, and New Latin *–ia.* A genus of about 600 species of perennial herbs or tender evergreen shrubs growing in water or wet places and having entire leaves and small flowers in long-peduncled axillary spikes or heads. Tropical and warm temperate North America.

Justicia americana (Linnaeus) Vahl. *IA, MI WATER WILLOW, aka American Water Willow (*americanus -a -um* of the New World, American.)
Habitat: Submerged or exposed mudbars, the muddy shores of streams and on islands, and shallow water of lakes, ponds, or streams, often in running water. Often excluding other vegetation.
Culture: Division, single node stem cuttings in spring. Seed grown plants not available.
Description: general form perennial from rhizomes forming large colonies culms to 2.5', stout, with prominent white lines leaves opposite, elliptic to linear, to 6", distinctive white midvein entire length of the leaf flowers violet to white, 5-merous, fruit is a ½" capsule, seeds when present verrucose key features Linear leaves with a white midrib, prominent white lines along the stem, colonial habit along shorelines.
Comments: C3. Local observations suggest that this species is increasing because erosion from agricultural lands is increasing the mud load of our streams, thus creating more of the mudbar habitats (Swink & Wilhelm 1994). Plants rarely produce seed and it is not available. 1,200,000 seeds per pound. Very limited availability as plants.

RUELLIA Linnaeus **Wild Petunia** *Acanthaceae Ruellia* for the French herbalist, physician, and botanist, Jean *Ruel*, (*de la Ruelle*) Latinized *Ruellius*, 1474-1537 or 1539. About 150 species of the tropics and temperate North America.

Ruellia humilis Nuttall *MA, MI, NC, PA, WI HAIRY RUELLIA, aka Fringe-leaf Ruellia, Fringe-leaf Wild Petunia, Hairy Wild Petunia, Low Wild Petunia, Wild Petunia (*humilis -is -e* low growing, of low growth, dwarf, from Latin *humilis*, humble; submissive; on or near the ground, low, shallow.)
Habitat: Dry, hill, sand, and mesic prairies, limestone prairies, oak openings dry open ground, gravelly hill prairies, sandy cemeteries that are occasionally mowed, shady gravelly soil. Tolerant of coarse, medium, and fine textured soils. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 4.5-7.5 or 6-7.5.
Culture: Fall plant or cold moist stratify 70 days (Wade 1995). No seed treatment needed (Shirley 1994). GA3 works marvelously in greenhouse (gni) " Cold moist stratification or fall sow. May prefer slightly cooler soils. Light cover." (Dunham 1993) 70 days cold moist stratification (pm 09). Cold moist stratify (100 days). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate slow.
Description: general form Erect perennial culms 0.5-2.0', stems 4-angled, finely hairy leaves opposite, mostly stalkless, toothless, with long hairs flowers violet, blue or white, sometimes pinkish, 5-merous, 1 ¼ "-2 ¾ " long, funnel shape; solitary, stalkless, growing from the leaf axils; fruit is a smooth capsule.
Comments: Blooms 6-8. C3. 64,000 to 150,000 seeds per pound. "Common on dry prairies, gravel hills, roadsides. The white form is quite uncommon." (Fell 1955)

Associates: Attracts songbirds, game birds, small mammals, hummingbirds, butterflies, and hummingbird sphinx moths.

Ruellia strepens Linnaeus * MA, MI, PA, WI SMOOTH RUELLIA, aka Limestone Petunia, Limestone Wild Petunia, Rustling Wild Petunia (*strepens* rustling, making noise, from Latin *strepo, strepĕre* to make a noise)
Habitat: Low or rich woods, bases of bluffs in ravines and valleys. In the se USA, calcareous forests (Weakley 2008). Tolerant of medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance high. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 6.0-8.5.
Culture: 70 days cold moist stratification (pm 09). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate slow.
Description/comments: Flowers blue, white, or violet, 5-merous. Blooms 5-10. C3. 300,000 seeds per pound.

ACORACEAE Martinov 1820 **Calamus Family** Consists only of *Acorus*. Traditionally treated as part of the *Araceae***.**

ACORUS Linnaeus 1753 New Latin, from Latin, an aromatic plant (perhaps sweet flag), from Greek *akoros, akoron*, classical name for *Iris pseudoacorus*. A genus of rush like herbs 2-6 species widespread in the temperate northern Hemisphere, high elevations in tropical Asia, and sporadically introduced in South America, with the flowers in a close spadix, sometimes separated from the *Araceae.* The spathe in *Acorus* is not morphologically equivalent to the spathe in *Araceae*. Morphological, anatomical, embryological, and molecular studies support this separation (Weakley 2007, Thompson in FNA 2000). The seeds are embedded in mucilage. x = 12.

Acorus americanus (Rafinesque) Rafinesque *PA AMERICAN CALAMUS, aka Sweetflag, Flag Root, Wild Calamus
Habitat: Seasonally inundated areas, wet meadows, low, marshy muddy areas. Tolerates fresh or soft water and acid soils. Swamps, marshes, along streams, borders of quiet waters, ditches. 6-20" preferred water depth; tolerates seasonal inundations, but may be killed by flooding of 1' for prolonged periods. Use in lower shoreline zones;. No drought tolerance, low nutrient load tolerance, no or low salt tolerance, low siltation tolerance. Partial to full sun. pH 5.9-8.8 or 5.6-7.2 (ecs) distribution: Because of the confusing taxonomy, the distribution of this species is to be determined.

In NW Illinois, this is a plant that grows in 1-2" of water in seeps and prairie fens, not in deeper water.
Culture: Seed may have dormancy requirement, but some lots are non-dormant. "Good germination (90%) after 60-90 days cold moist stratification; Cold moist treatment, or fall sow. Very light cover" (Dunham 1993). Our experience has shown good greenhouse crops can be produced with no treatment or 30-60 days cold moist stratification. 60 days cold moist stratification (pm 09). Plant 0.006 - 0.25 pls lb / acre (USDA 1997) or realistically seed 0.031 to 0.063 pls lbs per acre.

Plugs, rhizomes (root cuttings) and seed commonly available. Rhizomes and transplants more successful than seeding. Rhizomes planted 2-5" deep with well-placed roots below shoot. Plant on 1-3' centers to allow room for rhizomes to spread. Newly planted rhizomes and plugs are not flood tolerant, drawdown must be maintained until planting is established (18" tall). Survival rates as high as 100% are known. (USDA 1997) Plant 1000 roots or plugs per acre (Anon). *Commercial rhizomes may be of the following species!*
Description: general form Erect perennial, emergent semi-aquatic, sweet smelling when crushed roots long, aromatic, reddish rhizomes culms to 6" tall leaves sweetly aromatic, crowded at the base, long, narrow, sword-like, midvein and 1-5 additional veins mostly equally raised flowers yellow to brown 6-merous, inflorescence a 2"-4" dense, thick, cylindrical spadix, protruding from the side of sympodial leaf, a spathe-like structure; fruit is a dry brown berry N 2n = 24 key features Midvein of the leaves not well developed, about as prominent as the lateral veins. Produces fertile seed.
Comments: Blooms 4-6, aggressive, rhizomatous. Aromatic, especially the rhizome. Rhizomes form mat in upper 4-8" soil. Minimum root depth 10". Seed has been successfully stored for 9 months to 2 years. 88,845 to 189,640 seeds per pound.

"More common on small streams in prairie areas than in river bottoms. Kent, Willow, and Coon Creeks." (Fell 1955)

Recent studies of morphology, essential oil chemistry, cytology, and isozymes show the existence of two species of *Acorus* in North America. The local, native, fertile element, a fertile diploid, has basal leaves with 2 to several veins, while the Old World, sterile element, a sterile triploid introduced from Europe, has basal leaves with a single strong vein. In what we have propagated from seed and bought in root cuttings at our nursery, we have noted two very distinct types over the years. As *A. calamus* is sterile, all viable *Acorus* seed and all seed-grown Sweetflag are *A. americanus*. As both *A. americanus* and *A. calamus* have been used to refer all North American Sweetflag as a single species, literature references to either name are confusing at best. Roots and crushed leaves are fragrant; some say the odor resembles tangerines. Root used as medicinal plant by Ojibwa, Menominee and Pottawatomie (Smith 1932, 1923, 1933). Used as a cold medicine by Ojibwa (Densmore 1928) also used for fevers and coughs. The

distribution of Native American tribes who have ethnobotanical uses for Sweetflag correspond to the range of the native species, all who lived near it used it.
Associates: Provides waterfowl habitat. Aquatic furbearers use the entire plant for food and cover. Muskrats eat rhizomes. Waterfowl eat the seeds and use the cover for nesting. Wood ducks eat seeds.

Acorus calamus Linnaeus SWEET FLAG, aka Calamus (from Dioscorides, Greek and Latin *calamus*, a reed, reed-like, for the foliage, from καλαμος, *kalamos,* reed, cane, or from *calamus* of the shops; alternately *calamo* may be from Greek mythological figure *Kalamos*, the son of *Maiandros* (*Meander*), god of the Meander River.)
Habitat: Similar to above. Shallow ponds and marshes, on water less than 20". Introduced into North America by early European settlers.
Culture: No seed = no seed culture. Plugs and rhizomes (root cuttings) commonly available. Rhizomes planted 2-5" deep with well-placed roots below shoot. Plant on 1-3' centers to allow room for rhizomes to spread. Newly planted rhizomes and plugs are not flood tolerant, drawdown must be maintained until planting is established. Survival rates as high as 100% are known (USDA 1997). Plant 1000 roots or plugs per acre (Anon).
Description: general form Erect perennial emergent semi-aquatic herb; sweetish smell when crushed roots long aromatic rhizomes culms 2-3 (6) ft. leaves sweetly aromatic, crowded at the base, long, narrow, sword-like, only midvein prominently raised, 1 wavy margin flowers yellow-green to green/brown, 6-merous; inflorescence 2"-4" dense thick, pointed spadix protruding from the side of leaf-like spathe, fruit dry brown berry, does not produce fertile seed in North America N 2n = 36 key features Only midvein prominently raised, pointed spadix protruding from the side of leaf-like spathe. *A. calamus* generally has longer and wider leaves and longer spadices than *A. americanus.*
Comments Introduced, naturalized. Flowers 4-6. Aggressive, rhizomatous. Aromatic, especially the rhizome. Midvein of the leaves well developed, more prominent than the lateral veins. The size range of the leaves and spadix does overlap, but *A. calamus* generally has longer and wider leaves and longer spadices. Rhizomes form mat in upper 4-8" soil. Minimum root depth 10".
Associates: Provides waterfowl habitat. Aquatic furbearers use the entire plant for food and cover. Muskrats eat rhizomes. Waterfowl use the cover for nesting. Diploid and tetraploid populations are known from Asia.

AGAVACEAE Endlicher 1841 **Agave** or **Century Plant** Family.

AGAVE *Agavaceae* from Greek *agaue*, noble, for the stature of many species. Agave was the daughter of *Cadmus*, the founder of Thebes who is credited with bringing the Phoenician alphabet to Greece. Many *Agave* live vegetatively for many years and die after flowering and maturing seeds, i.e. the century plant.

Agave virginica Linnaeus See *Manfreda virginica* (Linnaeus) Rose

MANFREDA Salisbury 1866 formerly *Agave* **Tuberose** *Agavaceae* New Latin, probably from the name *Manfred*. Perennial American herbs that are closely related to and often included among those of the genus *Agave* from which they are distinguished chiefly by the bulbous stem base and annually decaying leaves. About 26 species, primarily in the southwest United States, Mexico, and Central America.

Manfreda virginica (Linnaeus) Salisb. ex Rose * OH AMERICAN ALOE, aka False Aloe, American Agave, Virginia Agave, Rattlesnake Master
Habitat: Dry and sterile soil, sandstone outcrops, glades and dry woodlands southern 1/4 Illinois. In our nursery, it has survived a decade in silty sandy soil.
Culture: Cold moist stratify works fine, some plants flowers 3rd year in ground in sandy soils. Seeds exhibit physiological dormancy, with germination at 28º/18º C after cold stratification (Baskin & Baskin 2002)
Description: leaves spreading, semi-succulent flowers 3-merous, fragrant like Easter Lilies N 2n = 60.
Comments: Blooms 5-7. CAM CO2 fixation. This species is perennial, not monocarpic like *Agave.* Several plants set seed in 1997. Most are still flowering in 2009. The fact that this species is perennial may be why it is separated into a different genus. American Aloe has potential as a green roof species in northern Ilinois.
Associates: Pollination is primarily by Sphinx moths. Sap may cause dermatitis.

YUCCA Linnaeus 1753 **Adam's Needle, Beargrass, Yucca** *Agavaceae*

Seeds ripen late summer, but may persist into winter in the pods. Most pods contain seeds that have been eaten by yucca moth larvae, and should be discarded. Seeds require cold moist stratification or fall planting. The seed coat may be perched on the tip of the emerging cotyledon. Seedlings should be transplanted before the taproot becomes long. Code B. Seedlings are somewhat slow to mature. Root cuttings are possible but not recommended. Offsets may be produced by damaging main root with a knife. (Cullina 2000)

Seed germs 1-2 weeks, with dormant seed coming up 2nd and 3rd year. Seed can be long lived, JLH reports a 6-year-old lot giving 95% germination. Some species benefit from light scarification (JLH)

Yucca filamentosa Linnaeus ADAM'S NEEDLE, aka Bear's Thread, Curlyleaf Yucca, Spoonleaf Yucca (*filamentosus -a -um* thread-like, fibry, formed of filaments or fibers, with filaments or threads, filamentous.)
Culture: Cold treatment improves germination, but is not necessary.
Description: Waxy white 2" flowers in large panicles, followed by stalk of brown black seed capsules. 6-8' tall. rosette of evergreen 1-2" wide sword-like leaves to 2' long. Zone 4.

Yucca glauca SOAPWOOD YUCCA, aka Spanish Bayonet, Small Soapweed (*glaucus -a -um,* glaucous, a white powdery or waxy coating on a leaf or fruit giving a grey-green, dull green, or grayish blue appearance, as in grapes or cabbage, from Latin *glaucus -a -um*, bluish-grayish, bluish-green, sea-blue, from Greek *glaukos)*
Habitat: Dry plains and slopes.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09).
Description: Rosette of finer 0.5-1.0" stiff pointed, spike-like, blue green leaves, terminating in a sharp point. Greenish white flowers in large spike on tall solitary stalk from center of plant, followed by larger seed capsules. Zone 3. 28,800 seeds per pound.

ALISMATACEAE Ventenat 1799 **Water Plantain** or Arrowhead Family. Formerly *Alismaceae.* Annual or perennial shoreline and wetland herbs, 12 genera, about 80 species (4 genera and 34 species in northern North America) with long-petioled, occasionally floating leaves and white flowers, nearly worldwide, primarily tropical and subtropical. Fruits are achenes or follicles.

ALISMA Linnaeus 1753 *Alismataceae* (New Latin, from Latin, water plantain, from Greek name for a water plant from Dioscorides, *plantago-aquatica* literally water plantain, the common name) A genus of about 9 species of herbs, cosmopolitan, 5 species in northern North America. The fresh leaves and roots are toxic but the toxic principal is destroyed by heat or by drying. x = 7.

For plant production, sow fresh seed in a cold frame in a flat setting in another non-perforated flat half full of water. Divisions in spring or fall.

Some consider all our water plantain to be *A. plantago-aquatica* Linnaeus, with var. *americanum* Roemer & Schultes (LARGE FLOWERED WATER PLANTAIN) and var. *parviflorum* (Pursh) Torrey (COMMON WATER PLANTAIN). *A. plantago* Linnaeus is the Eurasian Water Plantain, which is introduced in Alaska and Washington (2n = 14). Illinois has *A. subcordatum* and *A. triviale,* with *A. gramineum* native immediately southwest, west, and north of Illinois.

Alisma subcordatum Rafinesque COMMON WATER PLANTAIN, aka *alisma subcorde*, American Water Plantain, Mud Plantain, Southern Water-plantain, Water-plantain (Latin *subcordatum*, somewhat heart-shaped, from *sub*, below, under, almost, approaching, in botany less so than a similar plant, and *cordatum,* heart-shaped, from *cord*, heart, soul, mind, and *–atus*, possessive of or likeness.)
Habitat: Seasonally inundated, common in agricultural wetlands and hydric soil seed banks; shallow marsh, 0-6" water depths, mudflats and shorelines that dry up at end of growing season. Marshes, quiet to slow moving streams, muddy shores. Organic or silty soils. Full sun. Tolerates periodic inundation for short periods; Upper and lower shoreline zones. Often present in many hydric soil seed banks. Nutrient load tolerance moderate. Siltation tolerance moderate. Tolerant of medium and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none to moderate. Fertility requirement medium. Salinity tolerance none or moderate. (<0.5 parts per thousand salt content USDA). Shade intolerant. pH 7-8.8, or 5.0-7.0 (ecs). distribution: In almost every Illinois county.
Culture: 30 days cold moist stratification (pm 09). Fall plant or cold moist stratify (30), saturated soils, alternating temperatures-light. Some say seeds require scarification with sandpaper. May require alternating temperatures in moist, saturated to almost subaqueous conditions. Good establishment strategy is broadcast fresh seed on wet mudflats or on shorelines in the fall to provide natural stratification. Water levels must recede in spring, exposing bare mudflats for germination. In mixes plant .06-0.5 lb pls per acre (USDA 1997). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate moderate.

Seed, plug and rootstocks available. Best established from potted materials. Plant rootstocks or plugs 2-5" deep, or at the same soil level they have been growing.
Description: general form Erect or floating-leaved perennial emergent aquatic herb culms 0.25-3.5' leaves basal rosette, parallel veins, ovate to elliptical, long-stalked, smooth and firm, aquatic or terrestrial flowers small, white, occasionally pink, 3-merous, 1/8" wide, petals only slightly longer than the sepals; inflorescence of 4 or more whorls of flowers per stalk, with stalk taller than the leaves, fruits are a dense ring of dry seeds, each seed with 1 groove on the back N 2n = 14 key features Flowers 1/8" wide, petals only slightly longer than the sepals, fruits with 1 groove on the back.
Comments: Blooms 7-9. Grows rapidly in early spring. Used for wetland restoration, stream bank stabilization, and vegetated swales. Abundant seed producers. 825,000 to 1,568,000 seeds per pound.

"If the size of the petals is taken as the criterion this species is the less common. The petals are triangular and are not more than 2 mm long. The two species grow together in a ditch in Kent Creek bottom on North Central ave. Rockford." (Fell 1955)
Associates: Waterfowl, songbirds, pheasants, and rodents eat achenes. Leaves sometimes eaten by rabbits and deer. Plants provide shade and cover for fish.

Alisma triviale Pursh *NJ, PA LARGE-FLOWERED WATER PLANTAIN, aka *alisma commun*, Broad-leaved Water Plantain, Northern Water Plantain
Habitat: In muddy soil or shallow water. distribution North 1/3 of Illinois, rare south.
Culture: 30 days cold moist stratification (pm 09).
Description: general form Erect or floating perennial emergent aquatic culms 4"-40" leaves basal rosette, parallel veins, linear to lance-like to widely elliptical or oval, long-stalked, smooth and firm, aquatic or terrestrial flowers white, 3-merous, 1/3" wide, petals half again as long as the sepals; inflorescence of 4 or more whorls of flowers per stalk, with stalk above the leaves dense ring of dry seeds, each seed with 1 groove on the back key features Similar to *Alisma subcordatum* whose flower is 1/8" wide, petals ½ again as long as the sepals, seed with one groove on the back.
Comments: Blooms 6-9. 974,249 seeds per pound. "Most of our plants are of this species having petals 3 mm or more long. The petals are rounded and the free border somewhat fluted, a very obvious feature in fresh plants." (Fell 1955)

ECHINODORUS L.C. Richard ex Engelmann in A. Gray 1848 **Burrhead, Mudbabies** *Alismataceae* *Echinodorus* from Greek *echius*, rough husk, and *doros*, leathern bottle, referring to the ovaries, which in some species are armed with persistent styles, forming prickly head of fruit. A genus of ca. 9 (26, 4 in northern North America) species of herbs, Western Hemisphere, sub-cosmopolitan. *Echinodorus berteroi* (Spreng.) Fassett has recently been found in a restored pothole wetland in Kane County and an artificial pond in Will County (unknown in ne Illinois before 1995). In northwest Illinois, it has been recorded from Bureau and Carroll counties and recently discovered in Henry and Rock Island counties. Apparently a hydric soil seedbank species, it appeared in an early successional community in hydric soils in drowned cropland near Rock River in 2008; the Kane county record is also from formerly drained agricultural land. Also, found in drainage ditches on Rt. 92, north of Hoopole. Individual colonies may be short lived. The achenes are eaten by many bird species.

SAGITTARIA Linnaeus 1753 **Arrowhead** *Alismataceae* New Latin, from Latin *sagitta* arrow, and New Latin – *aria*, for the arrowhead leaves. About 25 (30, 25 northern North America) species of perennial, rarely annual, aquatic herbs of temperate and tropical regions, primarily of the Americas, Europe and Asia, having basal often sagittate or hastate leaves and scapose flowers with 3 sepals and 3 deciduous white petals. *Lophotocarpus* T. Durand is often included in this genus. Marsh birds and shorebirds eat seeds. Waterfowl eat seeds, tubers, and plants. Aquatic furbearers eat tubers and plants. x = 11.

Sagittaria latifolia Willd. ARROWHEAD, aka Broadleaf Arrowhead, Common Arrowhead, Common Arrowleaf, Duck Potato, Duck Root, *Wapato, Wapatoo* (Chinook jargon *wapatoo*, from Cree *wapatowa* white mushroom) (*latifolius -a -um* flat-, wide-, or broad-leaved, from Latin *latus*, broad, wide, *-i-*, and *folius*, leaf.)
Habitat: Seasonally inundated areas, ponds and streams, farmed wetlands, water or wet places. Swamps, ponds, streams. Almost any inland water, *except with strong lime, alkali, or salts*. Rich soils of damp lowlands, mudflats, and water up to 1.5' deep. Prefers water depth of 6-20", or moist mudflats to 26" below NWL. A member of long-lived hydric soil seedbanks. Tolerant of some inundation for brief periods. Nutrient load tolerance moderate. Siltation tolerance low. Anaerobic tolerance high. CaCO3 tolerance high. Drought tolerance none. Fertility requirement low. Salinity tolerance none. Shade intolerant, partial to full sun. pH 4.7-8.6 (usda) or pH 5.9-8.8.
Culture: 60 days cold moist stratification (pm 09). Fall plant for natural stratification. Broadcast seed and cover w/ thin layer of soil. Germination may extend into 2nd year, bottom heat, and saturated soils. Both seed and tubers must be planted in moist to saturated soils. In mixes plant 0.12 - 0.19 lb pls per acre (USDA 1997).

Clean, dry seed should be stored at 5º C for 8 weeks to allow after-ripening. Dry refrigerated seeds remain viable for three years (McIninch & Garbisch 2003). Seed can be soaked under refrigeration for 4 weeks for more consistent germination, or dry seed can be directly sown. Germination and growth are best in spring when days are warm and nights are cool. Seeds require light to germinate. Subirrigation works well; young plants require coolwater. (Hunter-Cario 2007)

Seeds, tubers, bareroot and potted plants are available commercially, but demand often exceeds the supply of tubers and potted plants. Tubers are commonly used, but fresh, delivered bare root material works well. Courier shipped materials in summer are not advised. The current demand for tubers exceeds the supply. Tubers require 6-8 week cold period to break dormancy. Plant tubers 2-3", deep in spring. Plant bare root plants and tubers on 2-6' centers (USDA 1997). Plant tubers on 1' intervals (Anon, 1981). They must be protected from predators. Spreads rapidly by rhizomes. Insitu tubers will survive freezing and oxygen depletion. Growth rate moderate. Seedling vigor typically does not apply.

Description: Perennial emergent or aquatic herb, 2.0-4.0', leaves 1-3', produces large white tubers. Inflorescence up to 30", spikes of white flowers.
Comments: Duck Potato is considered invasive in some part of the country. Blooms 7-9. Wetland restoration, used in lower shoreline zones. 907,200 to 1,669,118 seeds per pound. Many colonies of this plant do not appear every year, and populations vary widely from year to year. Perannates as tubers. "The common arrowhead. Bracts are ovate." (Fell 1955)
Associates: Attracts waterfowl. Provides waterfowl and wildlife food. Small tubers and seeds eaten by rails, ducks, and swans esp. canvasback ducks, gadwall ducks, trumpeter swans, whistling swans. May serve as nesting material for black terns. Muskrats, porcupines, and beaver eat tubers and plants. Provides habitat for macro-invertebrates and game fish, esp. channel catfish, white bass, shiners, and shad. Provides habitat for frogs, snakes and turtles. Canada geese may devour newly planted rootstock. Sap may cause dermatitis in some individuals.

Sagittaria rigida Pursh. DEEP WATER DUCK POTATO (*rigidus -a -um* rigid, stiff, inflexible. Latin *rigidus,* stiff, from the stiff leaves.)
Habitat: Almost any kind of bottom. Prefers slow moving water in slow moving streams, sloughs, large ponds, and lakes.
Culture: Plant tubers on 1-foot intervals (Anon 1981).
Description: Perennial aquatic.

AMARANTHACEAE A. L. de Jussieu 1789 **Amaranth Family**

FROELICHIA Moench 1794 **Cottonweed, Snake-cotton** *Amaranthaceae Froelichia* for Joseph Aloys von *Froelich*, 1766-1841, German physician and botanist who published on *Sonchus, Hieracium*, and *Gentian*.

Froelichia floridana (Nuttall) Moquin-Tandon var. **campestre** (Small) Fernald LARGE COTTONWEED, aka Common Cottonweed, Florida Cottonseed (*floridanus -a -um* of or from Florida, USA; *campestris –is -e* Latin of the fields, flat lands, or plains, growing in fields.)
Habitat: Disturbed sand prairies.
Culture: Cold moist stratify or fall plant. 60 days cold moist stratification (pm 09).
Description: Erect annual, 1.0-2.5', white flowers. Blooms 7-9. 368,000 seeds per pound.

APOCYNACEAE A. L. de Jussieu 1789 **Dogbane Family**

AMSONIA Walter ☠ **Bluestars** *Apocynaceae* Commemorating Charles *Amson,* fl 1760, 18th century Virginia physician. Hardy perennial herbs having a milky juice, alternate entire leaves, and showy, starry bluish flowers in terminal cymes. Easy in most soils, sun or part shade. Germinates in 30 days. Native to east USA and eastern Asia, about 20 species, 17 species in North America, 1 in Japan. Foliage has a very nice yellow or orange fall color. Nectar source for Mourning Cloak butterflies. Bluestars contain a poisonous latex sap, which may cause a mild skin irritation.
Germination code B (Cullina 2000). Older crowns are not easy to divide, but they may be separated in fall as the leaves yellow.

Amsonia tabernaemontani Walt. *KY, TN (in part) BLUE STARS, aka Common Bluestar, Eastern Bluestar (*tabernaemontani* after Jakob Theodore Mueller von Bergzabern of Heidelberg (1520-1590) [self-Latinized as *Tabernaemontanus*] 16th century physician and herbalist, born in Bergzabern, Rhineland-Palatinate, Germany. Also as listed as *tabernaemontanus* from Mount *Zabern*, Alsace (*Alsatia*) France. *Zabern* is also known as *Saverne* in French or *Zawere* in Alsatian, at one time was known as *Tres Tabernae Cesaris*, Caesar's three taverns, where oxen were changed before ascending the *Col de Saverne* (Pass of Saverne) a natural pass in the north of the Vosges mountains, hence the name tavern mountain.)
Habitat: Rocky woods, thickets, moist or wet woods.
Culture: Cold moist stratify, cut tip off one end of seed before sowing. Self-sown plants near the mother plant can be transplanted in spring. Three-inch stem cuttings taken during flowering root but may not form crown buds.
Description: Round clusters of starry light blue flowers in late spring early summer, willow-like leaves.
Comments: Blooms spring. Seeds mature early fall. Established plants are largely carefree and shade tolerant. 30,769 seeds per pound.

APOCYNUM Linnaeus **Dogbane, Indian-hemp** *Apocynaceae Apocynum* New Latin, from Latin, dogbane, Greek *apokynon*, *apo*, far and *kyon* a dog, related to Latin *canis*. A genus of about 12 species of perennial herbs, of eastern and central Asia and North America, chiefly American, with opposite leaves and small white or pink flowers in corymbose cymes. Dogbanes are an important nectar source for many butterfly species. Flowers provide nectar for Coral Hairstreak, *Satyrium titus,* and Edward's Hairstreak, *Satyrium edwardsii.*

Apocynum androsaemifolium Linnaeus SPREADING DOGBANE, aka Dogbane (*androsaemifolius -a -um Androsaemum* leaved, leaves like *Androsaemum* (now *Hypericum*) from *androsaemon*, from ανδροσαιμον, *H. perforatum*, from *aner*, man, *aima,* blood, referring to the blood red sap (or berry juice), *-i-*, and *folius,* leaf.)
Habitat: Mesic savanna, dry thickets and borders of woods; usually in open oak woods.
Culture: Seeds need no treatment, division.
Description: 1.0-2.0'. Pink flowers. 400,000 seeds per pound.
Comments: Blooms 6-8. Ethnobotanical uses, landscaping, aggressively rhizomatous, fragrant . "Common, usually in dry places as the edge of woods, thickets, and railroads." (Fell 1955) A hybrid complex with either or both *A. cannabinum* or *A. sibiricum* is known as *A. X medium,* with its attendant varieties. C3.

Apocynum cannabinum Linnaeus HEMP DOGBANE, aka Common Dogbane, Dogbane, Indian Hemp (*cannabinus -a -um* like cannabis or hemp, from Greek κανναβις αγρια, a name used by Dioscorides for the leaves of hemp-agrimony, wild hemp, meaning resembling hemp, from the Greek κανναβις, *kannabis,* for hemp, and *–inus*, belonging to or resembling.)
Habitat: Open woods, thickets, and borders of woods, disturbed areas. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 4.5-7.0.
Culture: Seed is non dormant. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description: Erect perennial to 3.3-4.0', greenish white flowers, somewhat rhizomatous, 12" minimum root depth.
Comments: This species is considered invasive in part of its range. Blooms 5-8. Fibers used for thread and cordage by Native Americans. Fibers used by orioles and other songbirds for nest materials. 500,000 to 589,993 seeds per pound.
"Common on railroads, roads, the edge of woods, often forming large patches in damp or dry places. Much like the two following species (*A. pubescens* and *A. sibiricum*)." (Fell 1955) "*A. pubescens* R. Br. Much the least common of the three. Harrison avenue road near the gas terminal. (Var. *pubescens* (Mitchell) A. DC.) (Fell 1955)

ARACEAE A. L. de Jussieu 1789 **Arum Family** A family of about 100-110 genera and about 4000 species of herbs and reduced aquatic herbs, cosmopolitan, mostly tropical and subtropical.

ARISAEMA *Araceae Arisaema* from Greek *aris*, a plant name used by Pliny for a kind of arum and *haima*, blood for the spotted leaves of some species; or Greek *aron*, arum and *haema*, blood, meaning related to *Arum*. Perennial herbs.
The red pulp contains germination inhibitors and painful calcium oxalate crystals. Wash pulp from seed while wearing latex or rubber gloves. Sow outdoors in fall or store dried seed in the refrigerator and sow in spring. Single leaf only first year. Code A or Code B, Code G. Division of corms and the small offsets while dormant in fall. Each fall the corm sheds its outer skin and roots; mature corms may be up to 12" deep. The smaller offsets should be planted at 6". Native *Arisaema* species may get a rust disease, Asian species are more vulnerable. Symptoms include cupped, miss-happened leaves with rusty brown spores. Remove and destroy infected plants. (Cullina 2000).
The plants cannot self-fertilize. On young or weakened plants, only the male flowers are fertile. On vigorous or older plants, only the female flowers are fertile.
Arisaema has contractile roots that pull the developing corm deeper into the ground every year until it reaches stable soil temperatures. Many plants concentrate food reserves in bulbs, corms, tubers or rhizomes that in mature plants may be 6-12 inches in the soil. They generally occur at a depth that discourages many foraging animals. However, as seedlings of these species germinate, these storage organs are formed at less than 1" depth. These plants have contractile roots that pull the plant deeper into the soil a little each year. Contractile roots are generally broad, fleshy, vertical, tapering, wrinkled-looking, and distinct from fine absorbent roots. Contractile roots dig deep into the soil each spring, and when firmly attached, they contract, pulling the plant downward. When a region of stable soil temperatures is reached, contractile roots are no longer formed. Dig up a dandelion or chickory, and observe that the leaves appear to come from underground, but contractile roots are actually pulling the plant into the ground. Other examples of plants with contractile roots include *Allionia nyctaginea, Allium sativum, Aquilegia canadensis, Botrychium, Crocus, Gentiana andrewsii, Hemerocallis, Hypoxis, Iris, Liatris, Narcissus, Nothoscordum, Oxalis incarnata, Plantago major, Scilla sibiricum, Symplocarpus foetidus, Taenidia, Veratrum,* and *Zygadenus.*
Species with contractile roots do not do worth a rat's hairy hind end in the overly compacted "firm" seedbeds of urban built-up soils.

Arisaema triphyllum (Linnaeus) Schott., or *A. triphyllum* (Linnaeus) Torr.?) JACK IN THE PULPIT, aka Jack In The Woods, Indian Turnip, Memory Root (*triphyllus -a -um* with three leaves, or leaflets.)
Habitat: Mesic savanna, mesic woodland, rich low woods, chiefly near streams.
Culture: This species seed is recalcitrant. Macerate and fall plant or cold moist stratify (60), light-shallow cover, successional restoration. Some ecotypes may not germinate until 2nd year. "Upon ripening in the fall, squeeze seeds out sowing immediately for germination the following spring. Light cover. Good to fair germination." (Dunham 1993). Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow

outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09) Sow seed in shade. Will come up second spring. Forms only bulb first season. Complete germination including leaf growth can be triggered the first year [using gibberellin] (JLH).

The seed is hydrophilic. Seed testing indicates viability of cleaned seed declines quickly in storage, should probably sow fresh seed. Some seed lots may be of very low viability. Nursery sources that properly store this and other hydrophilic seeds are available on request.

In restoration work, this species should be specified as dormant seedings only, new crop seed, well planned and implemented, on sites with an existing overstory.

Description: Erect perennial 1.0-1.5', green flowers, showy red berries.

Comments: Blooms 4-7. Seeds mature early fall. Ethnobotanical uses, landscaping. The fresh root is poisonous, but edible after cooking. Plant changes from sterile to male and then to female as it matures. 6,800 to 9,945 seeds per pound. "Common in damp woods. The purple-brown streaked spathes are the more common." (Fell 1955)

CALLA Linnaeus 1753 *Araceae Calla* From a name used by Pliny, Greek καλλος, *kallos*, beauty, beautiful. Alternately New Latin, modification of Greek *kallaia* rooster's wattles, perhaps from *kallos* beauty. Herbaceous perennial, monospecific genus, circumboreal.

Calla palustris Linnaeus *IL WILD CALLA, Water Arum, Bog Arum (*paluster -tris -tre* marsh-living, marsh-loving, of swamps, swamp loving, of marshes, or growing in bogs, bog-loving, from Latin *paluster -tris -tre* marshy, boggy, of swampy ground, from *palus*, *paludis*; *palustris* is often used as a masculine ending in plant names.)

Habitat: Bogs and pond margins. Circumpolar.

Culture: Seeds are hydrophilic. Remove brown seeds from pulp and plant immediately in standard mix. Trays must remain evenly moist. Easy by spring or summer rhizome cuttings with pots kept in shallow water. Code B* (Cullina 2000) 60 days cold moist stratification. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09) Stem cuttings root well in early spring.

Comments: White flowers. Blooms 4-8. Seeds mature late summer. Long creeping rhizomes.

PELTANDRA Rafinesque 1819 **Arrow Arum** *Araceae Peltandra* New Latin, from Latin *pelta*, and New Latin -*andra*; or from Greek *pelte*, small shield, and *andros*, male, referring to the shield-shaped tops of the staminate flowers.

Peltandra virginica (Linnaeus) Schott. *IA ARROW ARUM, aka Duck Corn, Green Arrow Arum, Tuckahoe, *Wampee* (*virginicus -a -um* of or from Virginia.)

Habitat: Wooded swamps, bogs shallow water, tolerates acidic waters, occurs in acid swamps, shallow fresh water, slightly brackish water, wet ditches, along streams. Swamps, stream and lake edges, tidal marshes (ecs). Requires wet, lime-free, humus-rich soil by the side of water or in shallow, still or slowly flowing, water in a sunny position. (Huxley 1992) Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance none.

Culture: Fresh seed, or seed stored in cold water. *Do not dry,* seeds are hydrophilic or recalcitrant. They must be stored in water. Seeds may be stored in a refrigerator, but they will rot. No additional treatment necessary. Like tribbles, the seeds are "born pregnant", often sprouting in cold storage. Anon 1981 says plant spring or fall, but fall seeding is duck feed. Recommended seeding rate 10 lbs per acre in up to 1' of water. Ernst recommends 1 lb per 1000 square feet. Growth rate slow. Seedling vigor medium. Some individuals may wish to wear rubber gloves when handling the seed or plants, due to the presence of calcium oxalate.

Division and stem cuttings are possible, but seed is much easier.

Description: 16" minimum root depth. "Species is spathe tubular at both ends, opening at the middle; flowers covering all or most of the spadix." (ilpin)

Comments: Blooms May to June. C3. Seed heads are spathes containing several large seeds. The plant is rich in calcium oxalate, which is toxic. When consumed, it makes the mouth and digestive tract feel as though hundreds of tiny needles are being stuck into it. The calcium oxalate is easily destroyed by thoroughly cooking or drying the plant. 378 to 881 seeds per pound.

The seed is berry-like with the consistency of an over-ripe bing cherry surrounding a cooked garbanzo bean. During cold storage, the soft outer portion may rot away, leaving the often-sprouting seed.

Associates: Provides food and cover for wildlife. Waterfowl (esp. wood ducks), marsh birds, and shorebirds eat seeds.

The seeds, berries, spadix, and roots are described as edible when properly cooked to eliminate the acrimonious principle.

SYMPLOCARPUS R. A. Salisbury ex Nuttall 1818 **Skunk Cabbage** *Araceae* Greek *symploke*, a connection, and *carpos*, fruit. The ovaries grow together to make a single fruit. A genus of 3 species of north temperate eastern North America and northeast Asia.

Symplocarpus foetidus (Linnaeus) Salisbury ex W. P. C. Barton SKUNK CABBAGE, aka Bearroot, Tickleweed (*foetidus* foetid, fetid, bad smelling, stinking, evil-smelling)
Habitat: Wet meadows, swampy woods, and thickets, swamps and other low areas. In se USA, seepage fed bogs and non alluvial swamps (Weakley 2007). Occasional in n. 3/4 of Illinois
Culture: The marble-sized, hydrophilic seeds ripen in late summer. The ripening spongy spadix changes from pleasant smelling to putrid as the seeds mature. Remove the seeds from the fruit and soak for a week, the sow immediately outdoors. Germination is hypogeal, with roots and a bud the first year, and 1-3 small leaves the 2nd year. Code C*, G. (Cullina 2000)
Comments: Blooms 2-3. Skunk Cabbage is known to maintain a temperature of 71.6° F (22° C) within the spathe as long as the air temperature is above freezing (Caduto 1985).

"Known in only a few places in the county. Spring Creek near Rock River; south "ledges" of Kinnikinnick Creek; Kent Creek in Page Forest and the slough west of Yale bridge. It is also found in Stephenson, Boone, Ogle, and DeKalb counties." (Fell 1955)

ARALIACEAE A. L. de Jussieu 1789 **Ginseng Family** A family of about 47 genera and 1325 species of trees, shrubs, vines, and rarely herbs, mainly of the tropics. Small flowers with 5 petals and 5 stamens in close-set clusters alternate to petals. Flowers in racemous umbels.

ARALIA Linnaeus **Aralia, Hercules-club, Sarsaparilla, Spikenard** *Araliaceae* (*Aralia* from French-Canadian name *aralie*, probably originating from Iroquoian.) A large genus 30-70 species of widely distributed often-aromatic trees, shrubs, vines, and trees with compound leaves and umbellate flowers, mainly in eastern North America, eastern Asia and southeastern Asia.

Aralia racemosa Linnaeus SPIKENARD, aka American Spikenard, Hungry-root, Life-of-man (*racemosus -a -um* in racemes, for the elongated inflorescence. New Latin from *racemus*, the stalk or a cluster of a bunch of grapes, and –*osus,* plenitude or notable development, with a raceme, a cluster of flowers each on their own stalk and arranged along a single central stem)
Habitat: Mesic woodland, rich woods and thickets, dense shade, north facing slopes, calcareous rocky ravines, and calcareous swamps. "Uncommon in moist woods and more frequent in ravines; Kishwaukee River ravines, the "dells" of Hall Creek, Ashley Forest preserve." (Fell 1955)
Culture: Cold moist stratify 60 days. Best planted outdoors in the fall. (pm 09). Seeds should be refrigerated at 33-38º until pretreated or planted. Macerate, fall plant immediately or moist cold stratify**.**
Description: Form: Erect, perennial, 3'-7' (10) tall forb; stems leafy, not bristly leaves widely-spreading, sharply and often doubly toothed, the 3 main divisions pinnately-divided flowers white, 5-merous, inflorescence of many, rounded umbels in a spreading, branched cluster (compound panicle) up to 12" long Fruits dark purple, berry-like key features 3'-7', stem leafy, not bristly; flowers many in a spreading branched cluster; fruit dark purple, berry-like.
Comments: Blooms July - August. One of the largest herbaceous plants in our flora. Ethnobotanical uses, landscaping. 216,000 to 528,000 (pm2002) seeds per pound

PANAX Linnaeus **Ginseng** *Araliacea Panax* is a reference to a plant in the *Aralia* family, usually the genus *Panax*, which includes the Ginseng plant; *panax* comes from two Greek words, which mean heal all afflictions, or cure all, and for Karl Linnaeus, it was considered a panacea. *Panax* is derived from classical Latin *panacēa*, any of various plants reputed to have universal healing powers; a concept also personified as the daughter of Aesculapius from Hellenistic Greek πανάκεια, a plant reputed to have universal healing powers, universal remedy, from Hellenistic Greek πανακής, all-healing. Also Greek, all-remedy, *panak-, panax*, from *panakeia*, from *panakēs* all-healing, panacea (from *pan-* and *-akēs* - from *akeisthai* to heal) and *-ia* -y; akin to Greek *akos* remedy.

Eleven (14) species of perennial herbs of the cooler climates of eastern North America (2 species ?) and eastern Asia (9-12 species ?) with aromatic, fleshy, tuberous roots, compound verticillate leaves, and a solitary umbel of flowers.

Seeds are hydrophilic and mature late summer. One to two seeds per red berry. Remove from pulp and sow immediately or store moist. If using purchased seed, be sure it has been properly stored and soak 20 minutes in 10% bleach solution to kill fungus. Germination is hypogeal, transplant three seedlings into deep containers. Transplant to garden in fall. Code B*, G. (Cullina 2000)

Panax quinquefolium Linnaeus AMERICAN GINSENG, aka Ginseng, Sang, Five Fingers, Tartar Root American Indian *Garantoquen,* manlike, similar to Chinese *jen-shen* or *rénshēn* also meaning manlike, in reference to the branched root. The English pronunciation is based on a Japanese reading of the Chinese characters. Scientific name literally means cure-all five-leaved. (*quinquefolius -a -um* with 5 leaves, or leaflets)
Habitat: Shaded woods, in rich soil. "Uncommon in mesophytic woods; Spring Creek woods, Mulford woods, Camp Hillcrest and the maple woods on Newburg road." (Fell 1955)

Description: Form: Erect, perennial, 8"-24" tall forb; stems solitary, roots long, branching like a human torso leaves single whorl of 3, palmately-divided into usually 5 stalked, toothed leaflet turning yellow in the fall flowers white to green, 5-merous; inflorescence a solitary, round umbel from the leaf axils fruits red, berry-like. key features 8-24" tall; roots long, branching; flower solitary umbel; leaves in a single whorl of 3, usually 5 stalked, toothed leaflets.
Comments: Special Concern in Wisconsin. Blooms July.

ARISTOLOCHIACEAE A. L. de Jussieu 1789 **Birthwort family** A family of about 6-12 genera and 600 species of vines, shrubs, and herbs of tropical, subtropical and warm temperate regions.

ASARUM Linnaeus ☠ **Wild Ginger, *asaret, gingembre sauvage*** *Aristolochiaceae Asarum* From New Latin, from Latin, hazelwort, from Greek ασαρον, *asaron*, a name used by Dioscorides, for *asarabacca*, a kind of nard. The flowers of *Asarum* are occasionally visited by mycotrophic flies (K. L. Lu 1982). 10 species of evergreen and deciduous herbs in North America and Eurasia. X = 13. Seeds have a fleshy appendage. All parts of the plant contain volatile oils that have the odor of culinary ginger, *Zingiber officinale*. *Asarum* contains several poisonous compounds, and may cause dermatitis in sensitive people.

Asarum canadense Linnaeus WILD GINGER, aka *saret du canada, gingembre sauvage* (*canadensis -is -e* of or from Canada or the north-east USA, of Canadian origin.)
Habitat: Rich woods and shaded calcareous ledges, floodplain woods and upland mesic woods. Optimum pH 5.5-6.5. Consistently moist but well-drained, organic soils.
Description: Polymorphic species, typical variety has spreading calyx lobes mostly 1-2 cm long with attenuate tips up to 1.5 mm long. 2n = 26.
Culture: Seeds are hydrophilic. Harvest fruit before fully ripe. Fresh, washed and cleaned seed should be sown immediately outside. Moderately difficult from seed. Easy by division in late spring or early fall. The plants are strongly determinate and put out one set of leaves. Best divided early. Code D*, G. (Cullina 2000) In order to germinate, seeds need a warm, moist period followed by a cold, moist period. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)
Comments: Blooms 4-5. Seeds mature early summer. Ants harvest the seeds. This genus is said to be subject to walnut wilt, caused by juglone, so do not plant within 60 feet of a walnut, butternut, or hickory tree. Tolerates moderate drought.
Associates: The flowers have evolved to attract small flies, but Wild Ginger is now largely self-pollinating. It is possible the flies are extinct, or they have not migrated north with the plants after the Wisconsinan glaciation. Wild Ginger is an alternate larval food source for the Pipevine Swallowtail butterfly (*Battus philenor*) and may be extending the butterfly's range north of *Aristolochia*, Dutchman's Pipevine. (Cullina 2000)

"*A. acuminatum* (Ashe) Bickn. WILD GINGER This replaces the next to some extent in this latitude but it is probably the less common. It is likely to be found in deep ravines, on densely wooded slopes, and on shaded limestone outcrops. The "dells of Hall Creek, Page Forest on Kent Creek and the "north" and "south ledges" of Kinnikinnick Creek." (Fell 1955)

"*A. reflexum* Bickn. More generally distributed than the preceding not being uncommon in mesophytic woods." (Fell 1955)

ASCLEPIADACEAE Some authors cite overwhelming evidence placing *Asclepiadaceae* as a tribe in *Apocynaceae.*

ASCLEPIAS Linnaeus **Milkweed, Silkweed** *Asclepiadaceae Asclepias* New Latin, from Latin name for swallowwort (*Cynanchum vincetoxicum*), from Greek *asklepias*, from the name for *Aesculapius, Asklepios*, mythic physician-hero, sometimes worshiped as a god of medicine, as a reference to the plant's medicinal properties. *Aesculapius* was the student of Chiron the Centaur and perfected the knowledge of medicinal plants. "*Aesculapius* was so good at healing the sick that it was even believed he could give life to the dead. This rumor worried Hades (the ruler of the dead) and he complained to Zeus. Zeus feared that all men might become immortal and killed *Aesculapius* with a lightning bolt."

A genus of about 100 species of perennial herbs, climbers, and tender shrubs found in tropical and temperate North and Central America with flowers having a corona of five concave hoods each of which bears a slender horn. Important larval food for butterflies. All are excellent nectar plants. The flowers, shoots, and pods were eaten. A very popular tropical silkweed currently in the trade is actually a tropical agricultural weed. Fruits are follicles with hairy seeds. Attracts butterflies and songbirds. Flowers provide nectar for Acadian Hairstreak, *Satyrium acadica,* Edward's Hairstreak, *Satyrium edwardsii.*

Monarch butterflies (*Danaus plexippus*) are specific to milkweeds, the only plants upon which eggs are laid. Eggs are laid on the underside of young leaves and larvae absorb the cardiac glucosides in the milkweeds as they eat which becomes a chemical defense. Monarch, Queen (*D. gilippus*), and Viceroy butterflies are Müllerian mimics. All are toxic and have co-evolved similar warning patterns to avoid predation. The cardiac glucosides are dangerous to humans and livestock.

Most species germinate from seed dry stored and surface sown, but germination is quicker and more uniform if seed is cold moist stratified. Code (A), B, H (Cullina 2000). Many species totally resent life in a pot. Best grown as bare root material, or sown in permanent locations, or potted material lined out first year, and not carried over. Milkweeds have thick, tuberous roots that may become infected if damaged. It is best to not transplant or try to divide them. Upland species will develop crown rot if kept too moist too long. Some species do not care for mulch.

Asclepias amplexicaulis J.E. Smith *NH, VT CLASPING MILKWEED, aka Blunt-leaved Milkweed, Curly Milkweed, Sand Milkweed (*amplexicaulis-is -e* clasping the stem, or stems clasped, from Latin *amplexus*, from *amplector*, to wind around, surround, *-i-*, and Greek καυλος, *kaulos,* stem of a plant.) (Published by Sir James Edward Smith (1759-1828), a British botanist and a founder of Linnaean Society.)
Habitat: Sand prairies, sandy, sunny oak barrens, and sand savannas.
Culture: 30 days cold moist stratification (pm 09).
Description: general form solitary terminal umbel of greenish-purple flowers roots from a stout caudex culms 1-3 feet leaves 2-5 pair of cordate-clasping tomentulose leaves, with wavy margins, leaves greenish or purplish key features Erect glabrous stem, sessile, clasping leaves, and pinkish-green flowers.
Comments: Blooms 6-7. "Rather common in the sand areas, the sandy prairies about Camp Grant and to a less extent on high prairies." (Fell 1955)

Asclepias curassavica Linnaeus SUNSET FLOWER (*currassavicus -a -um* of or from Curaçao, in the West Indies in the Caribbean.) This introduced species of orange flowered milkweed, a tropical perennial, annual in our area, came into the market several years ago. Some marketed its seed as *A. tuberosa* to restorationists and growers, creating a horrible mess. It is still marketed as an ornamental, perhaps as "Annual Butterflyweed". It may overwinter in the southeastern USA.

Asclepias exaltata Linnaeus POKE MILKWEED, aka Tall Milkweed (*exaltatus -a -um* exalted, raised high, very tall, erect, lofty, commanding.) The common name is for the plant's resemblance to *Phytolacca americana.*
Habitat: Mesic savanna, rich woodlands to moist deciduous forest. Tolerates open bright shade. Average to rich soils. Neutral to slightly acidic soils.
Culture: 30 days cold moist stratification (pm 09). Fall plant, light.
Description: White flowers with a lavender or green tint, 1.0-1.5', to 3-5' in some parts of its range.
Comments: Blooms 6-8. Seldom abundant. Some woodland colonies will not manifest themselves every year (Swink & Wilhelm 1994). Hardy to Zone 5, maybe 4. 48,000 to 75,600 seeds per pound.
"*A. phytolaccoides* Pursh. Poke Milkweed. Not uncommon in woods usually in damp places. Woods east of Roscoe and woods in Rock Cut." (Fell 1955 as *A. phytolaccoides*)
Associates: Attracts Silver-spotted Skippers, Pearl Crescents, Cloudywings, Great Spangled Fritillaries and Tiger Swallowtails. Deerproof?

Asclepias hirtella (Pennell) Woodson TALL GREEN MILKWEED, aka Barrens Milkweed, Green Milkweed (*hirtellus -a -um* somewhat or rather hairy, covered with short stiff hairs, minutely hairy, pubescent.)
Habitat: Flat sandy prairies, dry prairies.
Culture: Cold moist stratify, easy from dry stratified seed. Cold moist stratify 60 days (Wade). 30 days cold moist stratification (pm 09).
Comments: Blooms 6-8. 68,800 to 88,889 seeds per pound. "In Sugar River sand area it is locally frequent being usually near the edge of boggy places; it is also very uncommonly found on low prairies. Also known in Ogle County." (Fell 1955 as *Acerates hirtella* Pennell)
Associates: Pollinated by Diptera, bees.

Asclepias incarnata Linnaeus SWAMP MILKWEED, aka Pink Milkweed, Rose Milkweed (*incarnatus -a -um* flesh-colored, flesh-pink, from Middle English *incarnat*, from Late Latin *incarnatus*, past participle of *incarnare,* to make flesh, make fleshy, incarnate, from Latin *in-* in- and *carn-, caro* flesh, akin to Greek *keirein* to cut. Contrary to some sources, it does not mean blood-red.)
Habitat: Wet meadows, seasonally inundated areas, swamps, wet thickets and ditches, and shores, marshes, acidic bogs to moist calcareous habitats. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 5.0-8.0 (usda), or pH 5.0-7.0.
Culture: "Cold moist treatment or fall sow. Light cover. Good germination" (Dunham 1993). 30 days cold moist stratification (pm 09). Light / GA3-cold moist stratify (10) / fall plant-saturated soils, easy from dry stratified seed. "10 days moist stratification improves germination, but not necessary for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Needs stratification for 30 days ???? (Shirley 1994). Growth rate moderate. Seedling vigor low. Vegetative spread rate slow. Seeded alone plant 25 lbs per acre or 10 oz per 1000. (Shirley 1994) (Listing a seeding rate does not mean we endorse that rate!)

Description: Pink flowers, 2.0-6.0'. North of northern Illinois, this species does have a more red flower than our ecotype. If you planting contains deep dark pink to reddish plants, it is not local ecotype.
Comments: This plant is considered invasive in some parts of its range. Blooms 6-8. Ethnobotanical uses. landscaping, wetland restoration 63,148 to 137,326 seeds per pound. "Common in such wet places as ditches, sloughs, and streambanks. A very pale form is uncommon." (Fell 1955)
Associates: Attracts Monarch butterflies, larval host. Pollinated by Diptera and bees.

Asclepias purpurascens Linnaeus *CT, MA, MI?, RI, TN, WI PURPLE MILKWEED (*purpurascens*, becoming purple, purplish)
Habitat: Mesic savanna, open oak woodlands, wet mesic prairies. Favors mesic prairies, open woodland edges. Many populations occur on calcium-rich soils. In the se USA, it grows mostly on soils over mafic rocks (Weakley 2008) "Not common. Edge of dry woods, roads, roads, and railroads." (Fell 1955)
Culture: Cold moist stratify (20-30 days) or fall plant outdoors, light (Code C Ken Schaal). 30 days cold moist stratification (pm 09). Growth rate medium. Plants resent root disturbance and are best planted in permanent location while small (Rice 1988). Careful division in spring (?).
Description: general form Terminal umbel of purple flowers, occasionally one or two axillary umbels. 1.5-2.5' culms stout, puberulent leaves opposite, decussate, short petiolate key features Similar to *A. syriaca* but *A. purpurascens* has terminal umbel, glabrous corolla lobes, and pinnate-veined leaves with pointed tips, and smooth, downy follicle on a deflexed pedicel, while the former has umbels in three or more (2-6) leaf axils, hairy corolla lobes, net-veined leaves, and a downy follicle with numerous wart-like conical projections. (*A. syriaca forma inermis lacks warts on its follicle.*) Similar to *A. sullivantii* but the leaves have evident petioles and are wedge shaped at the base.
Comments: Blooms 6-8. Landscaping. Plants are self-fertile. Once common in New England, now rare due to habitat destruction. 72,000 to 82,256 seeds per pound.
Associates: Watch for slug damage. Pollinated by bees and Lepidoptera. A favorite nectar plant of Great Spangled Fritillary. Deer resistant.

Asclepias speciosa Torrey SHOWY MILKWEED (*speciosus -a -um* beautiful, showy, spectacular, splendid, good-looking. From Latin *speciosus*, beautiful, handsome, good-looking) Western United States.
Culture: Fall plant or cold moist stratify 1-2 months and spring plant (pots 2000) Cold moist stratify 60 days or direct sow in fall when soil temperature is below 54 degrees (after Wade). 30 days cold moist stratification (pm 09).
Description: 57,344 to 72,000 seeds per pound.

Asclepias sullivantii Engelm. ex Gray *MI, MN, WI SULLIVANT'S MILKWEED, aka Prairie Milkweed, Smooth Milkweed (for it's discoverer William Starling *Sullivant*, 1803-1873)
Habitat: Wet meadows, mesic prairie. "Common, being about as frequent as *A. syriaca*." (Fell 1955) Ah! those were the days.
Culture: "Cold moist treatment or fall sow. Light cover. Good germination" (Dunham 1993). 30 days cold moist stratification (pm 09). Cold moist stratify, easy from dry stratified seed (latter bad data source?)
Description: Pinkish-green flowers, 2.0-3.0'; cordate based leaves with short red petioles and smooth margins.
Comments: Blooms 6-8. Rhizomatous, will spread underground in favorable habitats several years after planting. 72,000 to 129,511 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, and Coleoptera.

Asclepias syriaca Linnaeus COMMON MILKWEED, SILKWEED (*syriacus -a -um* Syrian, of or from Syria, from Latin *syriacus* Syrian, from Greek *syriakos*, from Syria, Common milkweed was early introduced into Europe from east USA and thought by Linnaeus to come from Syria.)
Habitat: Ubiquitous, thickets, roadsides, and dry fields, dry to mesic prairies. "Roads, railroads, waste places, etc." (Fell 1955)
Culture: 30 days cold moist stratification (pm 09). "10 days moist stratification improves germination, but not necessary for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Fall plant or cold moist stratify (90); light or GA3.
Description: Perennial herb, 3.0-5.0', spreads by deep rhizomes. Pink to pale-purple flowers in upper leaf axils, 20-130 flowers per inflorescence. Large opposite, ovate to elliptical leaves.
Comments: Several authorities consider this plant invasive, even though the destruction of its habitat is influencing Monarch migration patterns (USDA). Blooms 6-8. Often weedy, thrives along roadsides. 64,000 to 144,287 seeds per pound.
Associates: Pollinated by long-tongued bees, other Hymenoptera, Diptera, and Lepidoptera. Attracts large milkweed bug, common milkweed bug, red milkweed beetle, and blue milkweed beetle. Ethnobotanical uses but potentially toxic.

Asclepias tuberosa Linnaeus *ME, NH, NY, SD, VT, QUE #NOX HI BUTTERFLY WEED, aka Chigger-Flower, Orange Milkweed, Pleurisy-Root (*tuberosus -a -um* tuberous, from the Latin *tuberosus*, for the tuberous, or thickened root, related to the root words of *Typha*, Latin *tumere* to swell.)
Habitat: Dry open soil, sand, dry, and mesic prairies, sand savanna, dry prairies, canyons, or woods. Widely distributed. Moderate water requirement. Will grow on coarse soils, but better on moderately coarse to moderately fine soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement low. Salinity tolerance none. Shade tolerant intolerant. pH 4.8-6.8 (usda) or pH 4.5-6.5.
Culture: Horticultural requirements of this species vary widely due to the dominance of precultivars in the trade. Dormancy and disease resistance has been bread out of some strains. "Cold moist treatment or fall sow. Light cover. Watch over watering plants. Good germination " (Dunham 1993). 30 days cold moist stratification (pm 09). Fall plant or cold moist stratify 30-60 days (pots 2000). "10 days moist stratification improves germination, but not necessary for good greenhouse crop." (pn nd) Germinates with no treatment, but improves with 60 days cold moist stratification. (Shirley 1994) No treatment works for many seed lots. Bottom heat / fall plant or cold moist stratify, cuttings, temperature sensitive, easy from dry stratified seed and root cuttings. Growth rate slow. Seedling vigor low. Vegetative spread rate none. Slightly self sows. Pure stand plant 4 lb per acre (Granite), or 25 lb per acre 10 oz per 1000. (Shirley 1994) Field sow fall, spring, early summer (pn nd). Bare root material is difficult to transplant. Containerized material easily winterkills.
Description: Native, very showy, perennial, 1-2', 1.5-3.0', multiple stems, with beautiful red-orange to yellow flat-topped cluster of flowers. Minimum root depth 16".
Comments: Blooms 6-9. Cut flowers, dried seed pods. Landscaping, rock gardens. Can be short lived, with individual plants appearing sporadically (Bob Horlock personal communication). Best in sharply drained soils. 68,800 to 130,760 seeds per pound. Said to thrive along roadsides but not in Earl Butz country. Also said by some to have weedy tendencies. Haa!

"More frequent in the sand areas than elsewhere but also found on dry prairies. It is in demand as a garden plant but is very difficult to transplant. We have the usual color variations." (Fell 1955)

Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, Hemiptera. Attracts hummingbirds and butterflies, bees, milkweed tiger moths, monarchs, and orange sulphur butterflies. Flowers provide nectar for Acadian Hairstreak, *Satyrium acadica,* Coral Hairstreak, *Satyrium titus*. Ethnobotanical uses.

The industry was compromised several years ago by the sale the seed of an orange-flowered, annual tropical milkweed as *Asclepias tuberosa*.

Asclepias verticillata Linnaeus WHORLED MILKWEED, aka Horsetail Milkweed (*verticillatus -a -um* verticillate, whorled, from Latin *verticillus*, the whirl of a spindle, and *–atus*, possessive or likeness.)
Habitat: Hill prairies, sand, dry, and mesic prairies, roadsides, open soils. "Very common weed on prairies that have been grazed." (Fell 1955)
Culture: No treatment, easy by seedling transplant. 30 days cold moist stratification (pm 09).
Description: White flowers, 1.0 - 1.5'.
Comments: Blooms 6-9. Attractive dried seed heads, landscaping, aggressive. 176,000 to 235,294 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera. Poisonous to livestock, attracts butterflies and song birds.

Asclepias viridiflora Rafinesque SHORT GREEN MILKWEED, aka Green Milkweed (*viridiflorus -a -um* green flowered, with green flowers)
Habitat: Sand and dry prairies.
Culture: Fall plant or cold moist stratify. 30 days cold moist stratification (pm 09).
Description: Green flowers, 1.5-2.0'.
Comments: Blooms 6-8. 56,704 to 57,600 seeds per pound. "Not uncommon in Sugar River sand area and occasional on dry prairies particularly the sandy ones about Camp Grant." (Fell 1955)

Asclepias viridis (*viridis -is -e* Latin a general green, fresh green, fresh, young, youthful, vigorous, from *viridis*.)
Culture: Cold moist stratify. 30 days cold moist stratification (pm 09).
Description/comments: 68,800 seeds per pound. Our plants required 3-4 years to bloom.

BALSAMINACEAE A. Richard 1822 **Touch-me-not Family**

IMPATIENS Linnaeus **Impatiens, Jewelweed, Touch-me-not, Snapweed, Balsam** *Balsaminaceae Impatiens* Latin for impatient, for the explosive release of seed when a ripe seed capsule is touched. A genus of 850-1000 species of hardy and tender, annual and perennial herbs and subshrubs.

The seeds are said require 140 days winter stratification (Eastman & Hansen 1995). Fall plant outdoors, germination will occur the second spring (pm 07).

Impatiens capensis SPOTTED TOUCH-ME-NOT, aka Orange Jewelweed (*capensis -is -e* of or referring to the Cape of Good Hope region (Table Mountain), in southern Africa, often meaning South Africa in general, or another cape region, the reference is unclear)
Habitat: Fens, alluvial, mesic woodlands, and upland swamps.
Culture: Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. Best planted outdoors in the fall. Further germination pretreatments not sure? (pm 09) Fall plant, alternating temperatures, light.
Description: Annual, 3.0-5.0', orange flowers.
Comments: Blooms 7-9. 64,000 to 69,013 seeds per pound. "Our common jewelweed." (Fell 1955)

Impatiens pallida Nutt. PALE TOUCH-ME-NOT, aka Yellow Jewelweed, Pale Jewelweed (*pallidus -a –um* pale, pallid, somewhat pallid or pale, from Latin *pallidus*, from *pallere* to be pale, from Greek *polios* gray.)
Habitat: Fens, alluvial, and mesic woodlands.
Culture: Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. Best planted outdoors in the fall. Further germination pretreatments not sure? (pm 09) Fall plant, alternating temperatures, light.
Description: Annual, yellow flowers, 3.0-5.0'. Blooms 7,8,9. Ethnobotanical uses, wetland restoration. 25,600 to 27,664 seeds per pound. "Definitely less common the above and found in the same damp usually shady places." (Fell 1955)

BERBERIDACEAE A. L. de Jussieu 1789 **Barberry Barberry family** In the broad sense, a family of about 15 genera and 650 species of herbs and shrubs, of the temperate Northern hemisphere and Andean South America. Several genera have north temperate relictual distributions, with species in eastern North America and species in eastern Asia, including *Caulophyllum, Diphylleia, Jeffersonia,* and *Podophyllum*. (Weakley 2008)

CAULOPHYLLUM Michaux 1803 **Blue Cohosh** *Berberidaceae Caulophyllum* stem-leaf, καυλος-φυλλον, Greek καυλος, *kaulos*, stem, and φυλλον, *phyllon*, leaf. A genus of three species of herbs with a relictual north temperate distribution, eastern North America (2) and eastern Asia (1).

Caulophyllum thalictroides (Linnaeus) Michaux BLUE COHOSH, aka Common Blue Cohosh, Green Vivian, Papoose Root (*thalictroides Thalictrum*-like, resembling *Thalictrum,* from *Thalictrum* and *oides.*)
Habitat: Mesic savanna. "Common in woods." (Fell 1955)
Culture: Seeds are hydrophilic. Fresh seed harvested before turning blue. Remove blue "flesh" by fermenting or using a blender, wash and sow immediately. Seed coat is very hard, scarification may help (via the blender). Sowing in permanent location may be best, as germination occurs in 2-3 years. Code C*, G (I?). (Cullina 2000) Best planted outdoors in the fall (pm 09). See Swink & Wilhelm (1994) for a discussion of the seed development.
Description: Yellow flowers followed by blue balls.
Comments: Blooms 4-5. Seed matures late summer to early fall. Ethnobotanical uses. 1,920 seeds per pound.

JEFFERSONIA W. Bartn **Jeffersonia Twinleaf** *Berberidaceae Jeffersonia* New Latin, from Thomas *Jefferson*, 1743-1826, third president of the United States and New Latin *-ia***.** A genus of 2 species, American and east Asian (eastern Russia, Korea, Manchuria) herbs with basal palmately lobed leaves, solitary white flowers, and capsular fruit.

Jeffersonia diphylla (Linnaeus) Pers. *GA, IA, NJ, NY TWINLEAF, aka Jeffersonia, Ground Squirrel Pea, Helmet pod, Rheumatism Root (*diphyllus -a -um* Greek for two-leaved, with two leaves.)
Habitat: Rich moist woods, partial to full shade. pH 6.1-7.8. In the se USA, *Jeffersonia* grows in moist and extremely nutrient-rich forests, generally in soils over calcareous or mafic rocks, or very rich alluvium (Weakley 2008).
Culture: Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm 09).
Description: 8 white petals and 4 sepals. "It is somewhat suggestive of *Sanguinaria* in flower and foliage."
Comments: "The wooded bank of Kishwaukee River at Camp Hillcrest, above New Milford. Also known on Walnut Creek in Ogle County." (Fell 1955)

PODOPHYLLUM Linnaeus 1753 **May-apple** *Berberidaceae* Barberry family *podophyllus -a -um* with stalked leaves, from *anapodophyllum,* Greek *anas* a duck *podos* a foot and *phyllon* a leaf for the leaves of *P. peltatum.* Narrowly defined a genus of 2 species of perennial herbs, one in eastern North America, one in eastern Asia.

Podophyllum peltatum Linnaeus MAY APPLE, aka American Mandrake, Mandrake (*peltatus -a -um* stalked from the face, not the edge, peltate, shield-shaped, like a *pelta*, a small half-moon-shaped shield, from πελτη.)
Habitat: Mesic and dry savannas, rich low woods and thickets.
Culture: Seeds are hydrophilic and ripen early fall. Harvest when the fruits turn yellow. Squeeze seeds from pulp, (macerate) and ferment to remove the rest of the pulp. Plant fresh seed outdoors for germination next spring. Late summer division, using all of the rhizome beyond the current leaf as one division. (Cullina) Division (pm 09).
Description: White flowers 1.0-2.0' Blooms 4-6. Landscaping. Will form large circular clones. Old colonies may persist after all trees have been removed. "Common in woods and frequently persisting in the open for many years after all the trees are removed." (Fell 1955)

BORAGINACEAE A. L. de Jussieu 1789 **Borage Family**

MERTENSIA Roth **Bluebell, Cowslip** *Boraginaceae* after Franz Karl Mertens 1764-1831, German botanist. A genus of about 45 species of perennial herbs of north temperate regions.

Seeds ripen late spring to summer and are moderately hydrophilic. Ripe seeds are quickly shed. Seeds should immediately be planted or stored in moist vermiculite @ 40ºF. Seedlings should be transplanted at the cotyledon stage. Transplanting later during warm weather may trigger early dormancy. Code D*. Roots can be broken apart during summer dormancy and replanted. (Cullina 2000)

Mertensia virginica (Linnaeus) Persoon ex Link VIRGINIA BLUEBELLS, aka Virginia Cowslip (of Virginia.)
Habitat: Wooded floodplains, mesic woods, Sugar Maple woods, may naturalize from wildflower plantings.
Culture: 60 days cold moist stratification (pm 09).
Description: Blooms 4-5. 155,200 to 156,150 seeds per pound.
"Much less common here than it is 100 miles south. Mulford woods near the Forest Preserve, Page Forest on Kent Creek, the "dells" of Hall Creek, etc. Found in only one place in Sugar River sand area, north of Shirland, and there apparently planted." (Fell 1955)

ONOSMODIUM Linnaeus **Marbleseed, False Gromwell** *Boraginaceae Onosmodium* having the smell of an ass, or a smell donkeys find appealing, New Latin, irregular from Greek *onosma*, a boraginaceous plant, from *onos* ass and -*osma*, from *osmē* odor; from a resemblance to *Onosma*.

Onosmodium hispidissimum Mackenzie.*IN [new nomenclature *Onosmodium bejariense* A. DC. var. *hispidissimum* (Mack.) B.L. Turner] MARBLE SEED, aka Eastern Prairie Marbleseed, False Gromwell, Shaggy Marbleseed
Habitat: Sand prairies, limestone or gravel prairies, dry savannas.
Culture: Hot water treatment (pm 09). Fall plant, double dormant, germination may extend over many years. Successional restoration works also. Sow in a galvanized metal tray and keep in an unheated cold frame, removing seedlings as they appear over the years.
Description: Erect perennial, 2.0-4.0', white flowers. Blooms 5-7. Landscaping. Will self sow, but probably self-allelopathic. In seed, it looks like a giant, steroidal puccoon. Calcareous soils. 272,000 seeds per pound. I accidentally swiped an old large plant in our yard with Roundup and killed it before it flowered that particular year. The next year, there were about a dozen little plants under the dead mother that were not there the year before.
"Occasional over the county usually in old pastures or on roads. Infrequently, as in Kishwaukee River Bottom at Perryville road, it is an abundant weed." (Fell 1955)

BRASSICACEAE Burnett 1835 or *Cruciferae* A. L. de Jussieu 1789. A family of about 340 genera and 3400 species, annuals, perennials, shrubs, rarely trees and vines, with the greatest diversity in the temperate Northern Hemisphere; cosmopolitan.

ARABIS Linnaeus 1753 **Rockcress** *Brassicaceae.* Derivation obscure, possibly from Greek name for *arabis*, a brassicaceous plant, probably from the Greek *Arab-, Araps,* Arab, Arabia; from its ability to grow in rocky or sandy soil. Large genus of herbs with white or purple flowers and flat siliques with nerved valves. Annuals, biennials, perennials.

Arabis glabra (Linnaeus) Bernh. TOWER MUSTARD
Habitat: Moist prairies, mesic prairies limestone woods, ledges and cliffs. "Common in waste places. (*Turritis glabra* Linnaeus)" (Fell 1955)

Culture: Cold moist stratify. Seeds germinate after a period of cold, moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Other germination pretreatments not sure? (Prairie Moon)
Comments: Pollinated by long-tongued bees, short tongued bees, other Hymenoptera, Diptera, blooms 5,6 biennial (or winter biennial, Ken Schaal recommends fall planting). 5,520,000 to 8,000,000 seeds per pound. Slender siliques, can be weedy.

Arabis hirsuta HAIRY ROCK CRESS
Culture: Cold moist stratify 60 days. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09).
Comments: 4,160,000 to 5,568,000 seeds per pound.

DENTARIA *Brassicaceae. Cardamine* is sometimes lumped into this genus, as this is sometimes lumped into *Cardamine*.

Seeds are hydrophilic and mature early summer. It is the opinion of Cullina (2000), that many colonies are reproductively isolated, self-sterile clones that set little seed. Best divided in late summer-early fall.

Dentaria laciniata Muhl TOOTHWORT, aka Crowfoot, Pepperroot (including *D. maxima* Nutt.) (*Laciniata* deeply cut leaves)
Habitat: Rich woods, wooded bottoms, and calcareous rocky banks, preferring moist soil and deep leaf mold, frequently occurring in large colonies. "Common in large or small patches in woods." (Fell 1955)

ERYSIMUM Linnaeus 1753 **Wall Flower, Treacle Mustard** *Brassicaeae Erysimum* From the Greek name *erysimon*, a kind of mustard, from *erysthai* to defend, protect, save; from its use as a medicinal herb. A small genus of Old World annual, biennial, and perennial herbs including several weeds and having alternate leaves, small yellow flowers, and slender terete pods (or 180 species of the Northern Hemisphere!)

Erysimum capitatum (Douglas ex Hooker) E.L. Greene WESTERN WALL FLOWER (in a dense head, for the flowers.)
Habitat: Cold moist stratify? Biennial. 1,312,000 seeds per pound.
Culture: 1,312,000 seeds per pound. (Code J Ken Schaal)

HESPERIS Linnaeus 1753 **Dame's Rocket**, **Rocket, Sweet Rocket, Dame's Violet** *Brassicaeae* New Latin, from Latin, dame's violet, from Greek, from feminine of *hesperios* of the evening, from *hesperos, hespera* evening. Biennial or perennial Eurasian herbs having large purple or white racemose flowers.

Hesperis matronalis Linnaeus DAME'S ROCKET, aka Dames Violet, Rocket (of matrons; of March 1st, from Latin *matronali,* adjective, of a matron; Matronalia was a festival for Mars celebrated by matrons on March 1st where gifts were given to matrons and brides.) The literal meaning of the scientific name is matron of the evening. Did Linnaeus have a sense of humor? Yes, Linnaeus is said to have named a useless weed "*Siegesbeckia*" after Johann Siegesbeck, one of his critics.
Habitat: Roadsides and old home sites, moderate to high moisture requirement, full sun to partial shade. Moderately coarse to moderately fine soils. Neutral soils, some acid tolerance. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.0-7.0.
Culture: This plant should not be cultivated. Seeded alone plant 3.2 per 1,000 sq. ft. (Stock). Blooms second year. Reseeds. Pure stand plant 8 lb per acre (Granite). Growth rate rapid. Seedling vigor medium. Vegetative spread rate none.
Description: Introduced biennial or short-lived perennial, 12-48", with deep lavender, white, to pink flowers. 12"minimum root depth.
Comments: B list noxious weed in Colorado. Invasive and banned in Connecticut. Prohibited in Massachusetts. This plant is considered invasive in many parts of the country. Blooms 5-6. Resembles, and often mistaken for phlox. Fragrant in the evenings. 171,914 to 296,000 seeds per pound.

"A garden escape that is found frequently on roadsides." (Fell 1955)

This species seems to be rapidly on the increase in our area, with more and larger colonies every year. It will be a colorful alternative to Garlic Mustard. This species is still on the books in a seed mix by the Illinois State Toll Highway Authority.

CACTACEAE A. L. Jussieu 1754 **Prickly-pear Cactus**

OPUNTIA P. Miller 1754 **Prickly pear** *Cactaceae* from the Greek name of a plant that grew near Opus (*Opuntis*) in ancient Greece. The edible prickly pears sold in the supermarket are *Opuntia ficus-indica.*

Harvest the fruits when they turn red, being cautious of the small, insidious spines. Clean the large seeds from the gelatinous fruit and ferment. Scarify and fall plant in a sturdy flat. Germination may occur over several years. Transplant when the 1st pad has expanded. Code B or C, G, I. Easy from pads. Allow pads to callous for a week and bury half way in a sandy or cactus soil mix. May also plant in permanent location. (Cullina 2000) The fruits are eaten by small mammals (and upland birds?). Small mammals probably spread the seed through scat. Acid scarification may help. Some species may be locally aggressive from seed, dominating sand prairies and sandy roadsides.

Opuntia fragilis is one of the most cold hardy cacti, growing at 56º-north latitude.
No pre-treatment necessary other than cold, dry stratification (pm 09). Clone, birds or small mammals steal newly planted pads. Use hardware cloth fencing until pads are firmly rooted.

Opuntia humifusa [*O. compressa*] (low growing.)
Habitat: Sand and sandstone prairies
No pre-treatment necessary other than cold, dry stratification (pm 09). Clone. Aggressive in sand, seeds spread by small mammals. 21,504 to 28,800 seeds per pound.

CAMPANULACEAE A. L. de Jussieu 1789 **Bellflower Family** A family of about 82 genera and 2000 species, mostly herbs, worldwide. Sometimes the *Lobelioideae,* the Lobelia subfamily, is recognized at the family level.

CAMPANULA Linnaeus **Bellflower** *Campanulaceae Campanula* from the diminutive of Late Latin *campana*, bell, for the bell shaped corolla. Herbaceous biennials and perennials.

Seeds ripen sequentially, with ripe and green seeds at the same time. Many seeds germinate with no treatment, and may bloom first year. Code A or B, H. 4-6 node cuttings before buds are formed may root slowly. (Cullina 2000)

Campanula americana Linnaeus TALL BELLFLOWER, aka American Bellflower, Elephant Flower (*americanus -a -um* of the New World, American.)
Habitat: Mesic and dry savannas.
Culture: Seed tests indicate this species may have little to no dormant seed, and is capable of germination soon after harvesting. Fall planting may slightly improve germination (single digits %). Light. 30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) 30 days moist stratification required for good greenhouse crop. Field sow fall. (Prairie Nursery nd).
Description/comments: Blue flowers, blooms 7-10. Seed matures midsummer - fall, 4 weeks after bloom. Landscaping, biennial, self sows. 1,134,000 to 2,720,000 seeds per pound. Listed as an annual by Fernald, but a biennial or winter annual in our estimation. "Common in damp places especially in woods and thickets." (Fell 1955)

Campanula rotundifolia Linnaeus HAREBELL, aka Bluebell, Bluebell Bellflower, Scotch Blue Bell, Bluebells Of Scotland (round-leaved, for the basal foliage)
Habitat: Sandy Black Oak savannas, hill prairies, and rock cliffs. Full to partial sun, dry to moderate moisture, woods, meadows, cliffs and beaches, in sandy or gravelly soil.
Culture: 30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify or no treatment, light. Sow in fall or stratify 30-60 days and spring plant, light cover, division.
Description: native erect perennial culms 6-18", mostly hairless, thin stems leaves stalked; the lower broadly oval, toothed, falling off as the plant matures, the upper leaves more linear flowers blue, 5-merous, bell-shaped, flaring lobes much shorter than the tube; inflorescence a branched, drooping cluster of usually many, nodding flowers; fruit is a nodding capsule opening at the base key features bell-shaped flowers, lower leaves oval and falling off as the plant matures.
Comments: Blooms 6-8. Seed matures midsummer to fall (4 weeks after bloom). Rock gardens and perennial borders, 4,500,000 to 14,400,000 seeds per pound. This is certainly not a plant for *de novo* restoration of mesic prairies in Chicago, as can be seen in some catalogs; rock gardens perhaps.

"*C. intercedens* Witasek. Harebell. It is not uncommon on dry gravel hills and prairies west of Rockton, south of Roscoe, and north of loves Park and on the moist outcrops on Hall Creek and Kishwaukee River. Markedly variable. A pretty plant but it lived only a few years in our garden. (*C. rotundifolia* L.)" (Fell 1955)

LOBELIA Linnaeus *Campanulaceae Lobelia* New Latin, from Matthias de *Lobel* (or de l'Obel, or von Lobel), 1538-1616, Flemish botanist and New Latin *–ia*. A large genus of annual and perennial herbaceous plants of wide distribution that have the corolla tube split.

Seeds mature early fall, about 3-4 weeks after flowering. Most species need no treatment. (Cullina 2000 Code A, H.) Cold moist stratify or fall plant may help with more uniform or quicker germination. Bottom heat is useful. Needs light to germinate. One- to two-node stem cuttings, early enough to encourage rosette formation or division of basal rosettes. Fruits are capsules with small brown seeds.

"Cold moist treatment, or fall sow. Very light to no cover. Tiny seeds. Excellent germination. (Dunham 1993). Easy from transplants or moist stratified seed.

Lobelia cardinalis Linnaeus *FL, NY CARDINAL FLOWER (*cardinalis* red, cardinal red, deep scarlet, *cardinalis* became associated with an ecclesiastical meaning, for the color of the raiment of a Catholic cardinal, now referring to the scarlet red color.)
Habitat: Seasonally inundated areas, wet meadows, wet savannas, swamps, and wet ditches. Needs rich, constantly moist soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 5.8-7.8.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring." (pn nd) Sow seed in fall or stratify 30 days and sow in spring (pots 2000). Growth rate moderate. Seedling vigor high. Vegetative spread rate none.
Description: Perennial, 2.0-4.0', with long terminal racemes of red tubular flowers, occasionally pink or white (more so in cultivation than the wild). 12' minimum root depth.
Comments: Blooms 7-9. Pollinated by hummingbirds, long-tongued bees, Lepidoptera. Often browsed by deer. Cut flowers, landscaping, wetland restoration. Can be short-lived, perennates by offsets. Numerous ethnobotanical uses. 6,400,000 to 11,292,758 seeds per pound. "Frequent on the banks of streams, in sloughs, and other wet places. We have not seen the white form. Planted in our garden in a rather dry prairie situation it showed a decided tendency to spread and persisted for several years." (Fell 1955)

Lobelia inflata INDIAN TOBACCO
Habitat: Alluvial, wet and mesic savannas. Occasionally volunteers from agricultural wetland seed banks. "Common in dry woods and clearings." (Fell 1955)
60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09).
Description: Blue flowers, 0.5-2.0' Blooms 6-9. Annual. 8,000,000 seeds per pound.

Lobelia siphilitica Linnaeus * ME, MA, NY GREAT BLUE LOBELIA, aka Giant Blue Lobelia (a reference to the plants supposed medicinal properties)
Habitat: Wet meadows, low woods, mesic savannas, swamps, fens, and upland swamps.
Culture: 60 days cold moist stratification. -Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring." (pn nd) (Code C, D Ken Schaal) Many greenhouse grown plants will bloom from seed the first year.
Description: Blue flowers, occasionally white (again, much more so in cultivation.) 1.0-4.0'.
Comments: Blooms 7-9. Cut flowers, landscaping, wetland restoration. Pollinated by long-tongued bees, short-tongued bees, Lepidoptera. Hummingbirds are attracted to the nectar. 8,000,000 to 17,600,000 seeds per pound.
"Common along ditches, sloughs, and other very wet places. We have seen plants with rose colored flowers but not white ones." (Fell 1955)

Lobelia spicata Lam. PALE SPIKED LOBELIA, aka Spiked Lobelia
Habitat: Dry prairies, hill prairies, mesic old fields, and disturbed prairies.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09).
Description/comments: Pale blue flowers, 1.0-1.5'. Blooms 6-9. 14,400,000 to 18,530,612 seeds per pound.
"It is without appendaged calyx and is more common than *L. leptostachya* and grows in dry places much as *L. inflata* does." (Fell 1955)
"*Lobelia leptostachya* A. DC. Uncommon in a low prairie situation in the Searle tract. Calyx lobes with definite appendages. (*L. spicata* var. *leptostachya* (A. DC.) Mack. & Bush)" (Fell 1955)

TRIODANIS Raf. ex Greene **Venus' looking-glass** *Campanulaceae Triodanis* three teeth, in reference to the seeds. Gledhill notes etymology unclear.

Triodanis perfoliata (L.) Nieuwl. VENUS LOOKING-GLASS, aka Clasping Venus' Looking-glass, Clasping Bellwort, Common Venus' Looking-glass, Roundleaved Triodanis. (*perfoliatus -a -um* perfoliate, with the leaves

joined around stem, as though the stem were growing through the leaves, or with a leaf-like appendage through which the stalk passes, from Latin *per-*, a prefix, through, extra, very, and *foliatus*, adjective, provided with or having leaves.) Annual in open sterile, sandy prairies with little competition. Common. 60 days cold moist stratification (pm 09).

CANNABINACEAE

CANNABIS Linnaeus 1753 **Hemp, Marijuana** *Cannabinaceae*

Cannabis sativa Linnaeus HEMP, aka Marijuana *sativus* Latin cultivated, sown, planted; that which is sown or planted for crops. "Locally abundant in town and country and increasing though it is classed as a pernicious weed that should be destroyed." (Fell 1955) Not a restoration plant but often sold.

HUMULUS Linnaeus 1753 **Hops** *Cannabinaceae* or *Moraceae* From the Old German name *humela*. A genus of two species of herbaceous perennial climbers, of the temperate regions of the Northern Hemisphere.

Humulus lupulus Linnaeus COMMON HOP (*lupulus,* a small wolf, from plants' old name willow-wolf, from its habit of climbing over willows)
Habitat: Wet savannas, thickets in thickets in alluvium. North temperate regions.
Culture: Moist cold stratify or fall plant; stem cuttings. Once established, self sows.
Description: Green flowers followed by attractive, aromatic seed heads, great for hopheads. Blooms 8,9. Ethnobotanical uses, landscaping. Herbaceous vine. 90,720 seeds per pound. "Since the hop vine is not cultivated in the county we have only the one species which is found infrequently in fence rows, thickets, and the edge of woods." (Fell 1955 as *H. americanus* Nutt.)

CAPPARACEAE **Caper family** formerly *Capparidaceae*

CLEOME *Capparaceae* derivation uncertain, possibly from Greek *kleos*, glory or from the ancient name of some mustard-like plant. Tender, annual herb.

Cleome serrulata ROCKY MOUNTAIN BEE PLANT, aka Stinking Clover, Toothed Spider-flower
Habitat: Dry railroad prairies and house yard seed banks. Native to the western foothills and plains. Disturbed areas. Low to medium water requirement, full sun. Moderately coarse to fine soils. Neutral soils, base tolerant. An occasional seed bank species.
Culture: 30 days cold moist stratification. Further germination pretreatments not sure? (pm 09) Sow in fall, or soak seed 6-8 hrs in hot water and sow in spring. Needs light to germinate, Very light cover to no cover. Pure stand plant 9 lb per acre (Granite).
Description: Western native annual, 1-4' (5), with white to pink to rose to purple fragrant flowers, with long protruding stamens, giving spidery appearance. Blooms 5,6,7,8,9. Annual, attracts bees and butterflies. Useful for short-term color, bedding plant, and soil stabilization. Good flower in masses, meadows and the back of borders. A sacred plant of the Hopi. 65,900 to 112,000 seeds per pound.

CAPRIFOLIACEAE A. L. de Jussieu 1789 **Honeysuckle Family** see the woodies on CD.

CARYOPHYLLACEAE A. L. de Jussieu 1789 Pink Family 86 genera and 2200-2300 species of herbs, shrubs, and trees, nearly worldwide, but mostly Northern Hemisphere.

ARENARIA Linnaeus 1753 **Sandwort** *Caryophyllaceae* New Latin, from Late Latin *(h)arenaria*, feminine of *(h)arenarius* of sand. Widely distributed chiefly low-tufted herbs with sessile leaves. *Arenaria serpyllifolia*, Eurasian annual sprawling weed with opposite entire leaves and paniculate small white flowers, is naturalized throughout North America.

Arenaria stricta Michaux STIFF SANDWORT, aka Rock Sandwort
"Locally common in its preferred habitats which are common in this county; gravel hills and stream banks, dry prairie hill-tops, limestone prairies and limestone outcrops." (Fell 1955)
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) 3,840,000 seeds per pound.

SILENE Linnaeus 1753 **Catchfly, Cats Fly, Campion, Fire-pink, Wild Pink** *Caryophyllaceae* A genus of ca. 700 species of Eurasia and North America.

Seeds ripen in early to late summer, 3-4 weeks after flowering. The mature, brown capsules open and allow the seeds to scatter. Harvest when capsules are yellow. Cold moist stratify seed. Transplant seedlings when one inch across. Code B. Many species produce short stolons after flowering, which can be used as cuttings or allowed to self-root and used as divisions. (Cullina 2000)

Silene regia Sims *GA, IL, IN ROYAL CATCHFLY
Habitat: Mesic to dry prairies and savannas, rare prairie, mesic to dry mesic railroad prairie. In the se USA, prairies and calcareous woodlands and forests (Weakley 2007).
Culture: Cold moist stratification. (Wade 1995) "Cold moist treatment has been successful. Light cover. Very good germination. Watch over watering." (Dunham 1993) 60 days cold moist stratification (pm 09). Cold moist stratify division. No pretreatment considered necessary.
Description/comments: Red flowers, blooms 7-8. 368,000 to 448,000 seeds per pound.

Silene stellata (Linnaeus) W. T. Aiton *MI, WI STARRY CAMPION, aka Widow's-frill
Habitat: Dry and sand prairies, mesic and dry savannas, woods, and dry, rather open woodlands. In se USA prairies and calcareous woodlands and forests; rare (Weakley 2007).
Culture: Cold moist stratification. (Wade 1995) 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant, cuttings, division.
Description/comments: White flowers, 2.0-4.0', blooms 7-9, landscaping. 480,000 to 1,008,000 seeds per pound. "Common in woods and thickets. It is very showy, having numerous flowers, and it grows in large patches. Our most common native catchfly. We have seen none that were not pubescent." (Fell 1955)

CERATOPHYLLACEAE S. F. Gray 1821 **Hornwort family** A family of a single genus with about 6 species of aquatic herbs, cosmopolitan. "A peculiar and apparently very primitive family…the *Ceratophyllaceae* "may have actually arisen from early angiosperms that existed prior to the fundamental divergence of monocots and dicots (Les 1988c, Less in Kubitzki, Rowher, & Bittrich 1993)" (from Weakley 2007). Fossils are known from the Lower Cretaceous, indicating this family is one of the oldest living angiosperm lineages.

CERATOPYHLLUM Linnaeus 1753 **Hornwort, *cornifle*** *Ceratophyllaceae* A genus of six species of cosmopolitan aquatic herbs. From Greek *keras*, a horn, and φυλλον, *phyllon*, a leaf, for the resemblance of the leaves to antlers. Aquatic herbs. x = 12, 19, 20.

Ceratopyhllum demersum Linnaeus COONTAIL, aka Coon's-tail, *cornifle nageante,* Hornwort (growing under water, submerged)
Habitat: Submerged or floating in muck bottomed sloughs, ponds, lakes, or slow streams. This is the most common species in the New World, and the least likely to be found with fruit. "Rather common in quiet water in all the northern counties." (Fell 1955)
Culture: Plant at 6 bushels per acre (Anon. 1981)
Description/comments: Aquatic herb, 2n = 24, 38, 40, 48. Waterfowl eat plants and seeds. Marsh birds and shorebirds eat seeds. Fish eat the plants. Provides cover for predator and prey fish.

COMMELINACEAE R. Brown 1810 **Spiderwort Family** After the two Dutch botanists Johan (1629-1692) and his nephew Caspar (1667-1731), Commelin, known to Linnaeus and Charles Plumier, a French Franciscan monk, botanist and traveler who apparently named this flower. Legend has it there was a third, not so famous Commelin, hence the withered 3rd petal; some say there were three brothers, but only two were productive and published. About 40 (41) genera and 630 (650) species of herbs, pantropical and nearly pantemperate, primarily tropical.

The flowers lack nectar and are ephemeral, lasting only a few hours, longer on cloudy days. Flowers are seldom preserved in herbarium specimens.

Commelina Linnaeus 1753 Dayflower *Commelinaceae* ≈170 species of herbs, cosmopolitan. x = 11-15.

Commelina erecta L. var. **deamiana** Fernald *IA, MI, NJ, PA, WI ERECT DAYFLOWER, aka Narrow-Leaved Dayflower, Sand Dayflower, White-Mouth Dayflower, Widow's tears
Habitat: Dry sandy soil of dunes and streambanks.
Culture: USDA does not cite seed treatments, but notes ca. 87% greenhouse germination. 1-3 node cuttings are successful.
Description: general form Erect but becoming decumbent perennial roots fibrous roots culms to 40", branching leaves with white-haired sheaths, closed towards the base surrounding the stem flowers blue 3-merous, ephemeral N 2n = 60.
Comments: Blooms July to September. Indeterminate growth form results in low seed yields. This species can be

considered a weed in rice fields.
Associates: A preferred food of white-tailed deer. Plants are grazed by cattle. Seeds are eaten by quail and mourning doves.

TRADESCANTIA Linnaeus 1753 **Spiderwort, Wandering-Jew, Spider-Lily, *Éphémères*** *Commelinaceae* Named for John *Tradescant*, the elder, ? –1637 (or 1638) (or 1608-1662), a traveler and gardener to Charles I of England. An American genus of about 70 species of herbs having mostly narrow elongated leaves and large white, pink, or violet ephemeral bracteate flowers, 30 species in northern North America. x = 6-8, probably others. *Tradescantia* hybridize when grown in proximity (E. Anderson and R. E. Woodson Jr. 1935).

Tradescantia may have mature seeds, green seeds, and flowers at one time. The seed clusters should be picked towards the end of the flowering season. Ripe seed pods quickly shatter. Dried seed has moderate success. The seeds may be moderately hydrophilic and should be sown immediately or stored in ziplocks under refrigeration. Code B*. Plants are easily divided in spring before flowering stems appear. Single node stem cuttings are reliable. (Cullina 2000)

Tradescantia bracteata Small *IL, MI BRACTED or PRAIRIE SPIDERWORT, aka Long-Bracted Spiderwort, Widow's Tears (bracted)
Habitat: Dry prairies and gravelly railroad banks. Junk yards and dumps in Illinois.
Culture: Seeds germinate most successfully in cool soil. Best planted outdoors in the fall. (pm 09) Fall plant or cold stratify (120) days cold moist stratification. Division of mature plants any time with care.
Description: Purple-roseate flowers, 0.5-1.5'.
Comments: Blooms May - July. Aggressive in rich soils, rhizomatous. "Probably not native in the northern tier of counties. We have found it in Kishwaukee River Forest Preserve in a place where planting seems probable." (Fell 1955)

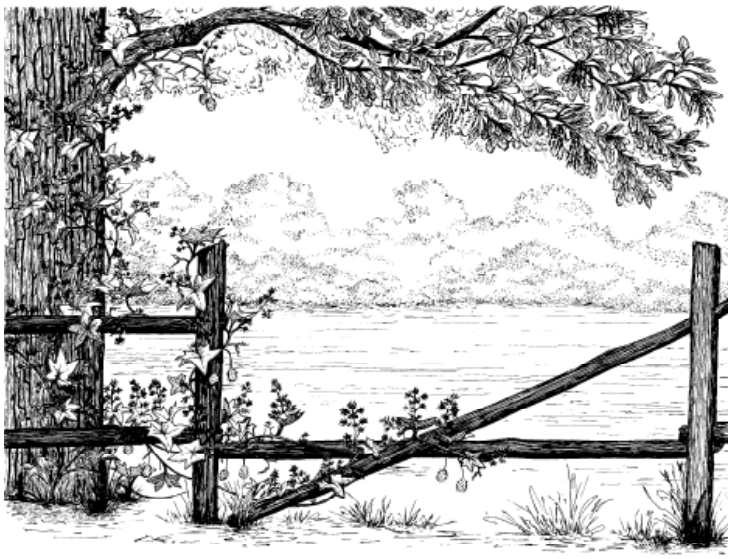
Tradescantia ohiensis Rafinesque *PA OHIO SPIDERWORT, aka Blue Jacket, Common Spiderwort, Smooth Snot-weed, Spiderwort, Widow's Tears (*ohiensis* of Ohio)
Habitat: In most native systems, limited only by saturated soils and excessive shade. Wet, mesic, dry, sand, gravel, and hill prairies. Dry to mesic species. Moist fields, open ground. More tolerant of drought than flooding. Has some tolerance for early spring flooding for brief periods. Nutrient load tolerance moderate, salt tolerance not available. Siltation tolerance moderate. distribution The most common and widespread *Tradescantia.* Its range is expanding due to cultivation.
Culture: "Fall sow, If you cannot, cold moist treatment for 120 days and sow early spring. Light cover. good germination." (Dunham 1993). 120 days cold moist stratification. Seeds germinate most successfully in cool soil. Best planted outdoors in the fall. (pm 09) GA3 in greenhouse gives good results. (gni). Fall plant cold moist stratify (120) , cool soils. Easy from fresh or moist stratified seed. Self sows abundantly in dry gardens and in sand. Seed and plants readily available. Easy by division in spring-cuttings. In mixes, plant 0.031 to 0.062 pls lbs per acre (usda 1997).
Description: culms 1-4' flowers blue, purple, or rose, occasionally white N 2n = 12, 24
Comments: Blooms mid-May to the heat of late June. Landscaping, drought resistant. Fruits are capsules that release seeds when ripe. Useful in slope stabilization. Relatively common on roadsides. Spiderwort's early seasonal growth has helped it escape damage from recreational mowers. As a monocot, it is not damaged by the broad leaf herbicides☠ used on most roadsides. This species responded to Sonic Bloom (a kelp based fertilizer) presoak winter 1996-7, and Giberillic acid (GA3) in 2001. 128,000 to 169,656 seeds per pound.

Each flower lasts only a few hours, opening in the morning, and 'melting' in the hot noonday sun, lasting longer on cool, cloudy days. In wet years and in shade, this species may bloom until October. Vivipary is not uncommon. Some Genesis Nursery employees have lovingly referred to this plant as Snotweed.

"Common in sandy places, on railroads and on roadsides. Occasionally there are pure white forms." (Fell 1955)
Associates: Pollinated by long-tongued bees, especially Bumblebees. Also Halictine bees. Syrphid flies feed on stray pollen and are not pollinators. Few insect pests, though *Lema collaris* (Leaf Beetle sp.) is reported to feed on the foliage. White-tailed Deer, Cottontail rabbits, Box turtles and livestock eat the foliage. Attracts songbirds. The leaves and stems are said to be edible cooked or fresh*, but contact dermatitis is also known*. Stick with the Iceberg lettuce.

Tradescantia virginiana Linnaeus VIRGINIA SPIDERWORT, aka *Éphémère de Virginie* (of Virginia)
Habitat: Sand prairies, savannas, and woodlands. Moist woods and meadows. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 4.0-8.0.
Culture: Easy from fresh seed immediately planted or moist stratified seed. Growth rate rapid. Seedling vigor high. Vegetative spread rate none. Limited commercial availability.
Description: general form Herbs, erect or ascending, rarely rooting at the nodes roots fleshy and fibrous, 4" minimum root depth culms to 2' tall leaves stout leaves w/o a bluish tint flowers blue, purple, roseate, or white N 2n = 12, 24

key features compared to *T. ohioensis*, it has hairy slender pedicles, larger bracts subtending the flowers, shorter plant with stouter leaves that do no have a blue tint.
Comments: Blooms 4-5. Drought resistant. 352,000 seeds per pound.
"Commonly attributed to this and other northern tier counties but we have not found in this county a blue *Tradescantia* with pubescent calyx and pedicle." (Fell 1955)
Associates: Primary pollinators are bumblebees. Also pollinated by long-tongued bees, short-tongued bees, honeybees, Little Carpenter bees, Halictine bees, and Coleoptera. Syrphid flies feed on stray pollen and are not pollinators. Few insect pests, though *Lema collaris* (Leaf Beetle sp.) is reported to feed on the foliage. White-tailed Deer, Cottontail rabbits, wood tortoise and livestock eat the foliage. Attracts songbirds.



COMPOSITAE Adanson *Asteraceae* Martinov
Compositae Giseke 1792 or *Asteraceae* Dumortier 1822
Historically the fruits have been called achenes (*akenes in some older works*). Achenes are hard dry, single-seeded fruits that develop from unicarpellate, superior ovaries. Technically, they are *cypselae*, achenes developed from an inferior bicarpellary ovary fused with the calyx tube. *Cypsela* New Latin, from Greek *kypselē* hollow vessel, chest, box; akin to Greek *kyphos* bent, crooked.
Many composites are self-sterile. Softwood cuttings of many species root fairly well but may not overwinter well. (Cullina 2000)

ACTINOMERIS *Compositae* (*actis,* a ray and *meris*, a part, for the irregular rays). This genus is often included in *Verbesina* Linnaeus.

Actinomeris alternifolia (Linnaeus) DC *NY WINGSTEM, aka Yellow Ironweed (*alternifolius* with leaves alternating on opposite sides, alternating leaves, *alternus*, by turns, alternate, *-i-*, and *folius*, leaf.)
Habitat: Wet savanna, mesic woodlands; shaded floodplains, moist wooded slopes.
Culture: Cold moist stratify or fall plant. 30 days cold moist stratification (pm 09). Genesis seed tests indicate most lots benefit substantially from cold moist stratification or fall planting.
Description: Yellow flowers; 3-6' tall or more; leaves are alternate with decurrent bases. Distinguishing characteristics are the tall growth habit, alternately arranged lanceolate leaves, yellow flowers, and distinctive 'wings' that run the length of the stems.
Comments: Blooms 8-10. Landscaping. 135,766 to 181,491 seeds per pound.
Associates: Dick Young says "this durable standby is part of the relict pantry that keeps Juncos and finches happy when snow blankets our countryside." His book on Kane county plants is refreshing compared to a most floras. This species has low food value for deer.

AGERATINA Spach 1847 **Milk-poison, White Snakeroot** *Compositae* synonym with part of *Eupatorium.*
Ageratina like a small *Ageratum*, from the generic name *Ageratum* and Latin *-ina*, diminutive. A large genus of about 250 species of North America, Mexico, Central America, and Andean South America. x = 17.

Ageratina altissima (L.) King & H.E. Robins. var. **altissima** see *Eupatorium rugosum,* Milk-poison, aka White Snakeroot.

AGOSERIS *Compositae* Western North America and South America.

Agoseris cuspidata (alternately placed in *Micoseris* or *Nothocalais*) PRAIRIE DANDELION
Habitat: Dry hill prairies.
Culture: "Cold moist treatment 30 days. Likes cooler soils: sow early spring or late fall. Light cover. Fair germination. (Dunham 1993) 128,000 seeds per pound.

AMBROSIA Linnaeus 1753 **Ragweed** *Compositae Ambrosia* (food of the gods, with the fragrance of ambrosia, Latin, from Greek, literally, immortality, from *ambrotos* immortal, from *a-*, and Greek *mbrotos* mortal, whence Greek *brotos, mortos,* mortal, and *-ia*, the food of the Greek and Roman gods, or the ointment or perfume of the gods. How ragweed relates to the food of the gods is unclear.) A genus of about 43 species of herbs, cosmopolitan. Wind pollinated, pollen allergenic. *Ambrosia trifida* and *A. artemisiifolia* are C3 plants (ilpin)

Ambrosia psilostachya A.P. de Candolle WESTERN RAGWEED, aka Perennial Ragweed. *psilostachya* from Greek *psilos,* stripped of hair, smooth, and *stachys*, a spike, or Greek *psiloo*, strip bare, become bare.
"Similar in appearance to *Ambrosia artemisiifolia*, but with a creeping rhizome, and thicker, short-petrolate (sic) to such sessile leaves." (ilpin) C4 plant (Risser et al., 1981, page 158). Western ragweed may have beneficial allelopathic influence on some native prairie species.
"A perennial that is much less common than *A. elatior*. It is found on some of the dunes in Sugar River sand area, on the prairies west of Rockton and on the sandy prairies about Camp Grant. (A. *psilostachya* DC. var. *coronopifolia* (T. & G.) Farw.)" (Fell 1955 as *A. coronopifolia* T. & G.)

ANAPHALIS Augustine de Candolle **Pearly-everlasting** *Compositae Anaphalis* from Greek name for a similar plant. Herbs of north temperate regions having canescent foliage and small discoid heads of dioecious flower. Woolly perennials used for attractive dried seed heads. In past used medicinally, reported anti-aphrodisiac properties. Give full sun and good drainage. Can be divided in spring.

Anaphalis margaritacea (Linnaeus) Benth & Hook. f. PEARLY EVERLASTING (*margaritaceus -a -um* pearly, pearl-like, the flower heads, from *Margarita,* a pearl.)
Culture: Germination pretreatments not sure? (Prairie Moon)?
Description: Hardy perennial to 3', an everlasting having floccose-woolly herbage and small corymbose heads with pearly white scarious involucres. White woolly, excellent everlasting, often died colors. Very similar to *Gnaphalium obtusifolium*, which smells strongly like maple syrup. *A. margaritacea* has no odor to speak of. Blooms 7. 1,120,000 seeds per pound.

ANTENNARIA Gaertner **Pussy-Toes, Everlasting, Ladies Tobacco** *Compositae Antennaria* New Latin from Medieval Latin *antenna* and New Latin *-aria*, connection to or possession of, for the resemblance of the clavate pappus hairs of the staminate plants to insect antennae. The common name is from the resemblance of the inflorescence to the paws of a cat. About 70 species of woolly or hoary herbs forming semi-evergreen mats that are natives mostly of temperate regions and have small whitish discoid flower heads and a pappus formed of club-shaped bristles. Dioecious, some members of the genus parthenogenetic or apogamous. Apomixis has lead to the formation of many races and subspecies. *Antennaria* is a larval food of the American Lady butterfly (*Vanessa virginiensis). A. parviflora*, direct sow in spring (pots 2000).
Dry seed should be placed in a ziplock and refrigerated until sown. Code A or Code B. Easy by division, in spring or summer after new rosettes have begun rooting. (Cullina 2000)

Antennaria neglecta Greene CAT'S FOOT, aka Field Pusseytoes, Prairie Pusseytoes (*neglectus -a -um* Latin neglected, disregard, overlooked, unobserved, insignificant.)
Culture: Cold moist stratify or fall plant, division with care anytime.
Comments Blooms 4. Seeds mature late spring. Ground cover, stoloniferous. 3,360,000 (pm) seeds per pound; 12,800,000 (Shirley) seeds per pound.

Antennaria plantaginifolia (Linnaeus) Richardson PUSSY TOES, aka Plantain Pussytoes. (*plantaginifolia* plantain-leafed**)**
Habitat: In most prairies and open woods
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Division of mature plants anytime with care.

Description: White flowers, 4.0-8.0 inches.
Comments: Blooms 4,5,6. Seeds mature late spring, early summer. Ground cover 4,440,000 to 4,536,000 seeds per pound.

ARTEMISIA Linnaeus 1753 **Wormwood, Mugwort, Sage** *Compositae* New Latin *Artemisia*, from Latin *artemisia* mugwort, from Greek, probably irregular from *Artemid-, Artemis* and *-ia* after the Greek Moon goddess Artemis, often portrayed as a virgin huntress. Alternately, commemorating *Artemisia*, wife of Mausolus. Shrubs and herbs widely distributed in temperate and cool regions and having strongly scented foliage and small rayless flower heads.

Artemisia caudata BEACH or TALL WORMWOOD (*caudatus -a -um* caudate, tailed, with a tail, from the long tipped panicle, from *cauda (coda, codae*) f., the tail of an animal.)
Habitat: Open sandy prairies.
Culture: No treatment. Germination pretreatments not sure? (Prairie Moon)?
Comments: Sometimes host of *Orobranche fasciculata*. In our area, *Orobranche* host is *Chrysopsis*. Biennial, rarely perennial. Pioneering species, abundantly self sows on open sand to the point of being aggressive. 4,000,000 seeds per pound.

Artemisia ludoviciana Nuttall PRAIRIE SAGE, aka White Sage (of Louisiana, or St. Louis, the western USA at that time; referring to one of the King Louis XIV (named by La Salle) (Ludvig is a Germanic version of Louis), and by extension, to the Louisiana Territory (or Louisiana Purchase) or a reference to the State of Louisiana, which was named after King Louis)
Habitat: In northwest Illinois, white sage grows in sand and dry prairies, primarily near major rivers, presumably where it was introduced by Native Americans. Even many of the roadsides and railroad prairies where this grows are near Rock River and potentially near Native American habitation sites. We have noted several locations along the Rock River, such as Green Rock, Joslin, Nelson, and Spring Hill, or on high dunes with scenic overviews of the Winnebago (Hochunk) Swamp at Normandy, on the bluff of Franklin Creek at Nachusa Grasslands, and on prairie bluffs of the Illinois River near Ottawa. We have not seen it in other settings. Adapted to a variety of soils. Not native but introduced prehistorically.
Culture: Seed needs no treatment, light. 30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Behaves as a pioneer, establishing easily, even on harsh sites.
Description: Herbaceous, rhizomatous, half-shrub. 2.0-3.5'. Blooms 7,8,9. Attractive woolly-white foliage. Aromatic, may be aggressively rhizomatous or may grow as an interstitial plant. Fair forage for livestock and wildlife. 4,000,000 to 4,390,400 seeds per pound. We have a form that is 6-10 inches tall.

This is certainly not a plant for de novo restoration of mesic prairies in Chicago, as can be seen in some catalogs. This is not a prairie plant in northern Illinois. Now (in 2009), Illinois Pheasants Forever is putting this in mixes. Blatant ignorance of biogeography.

ASTER Linnaeus **Starwort, Wild Aster, Michaelmas Daisy, Frost-Flower** New Latin, from Latin, *aster*, from Greek *aster-, astron,* star, aster, for the flower heads resembling little stars. Chiefly fall-blooming leafy-stemmed herbaceous plants native to temperate regions and having discoid and usually daisy like radiate heads, a multiseriate involucre, and a pappus of a single series of capillary bristles. Most members of the genus attract butterflies, game birds, and songbirds. The disc flowers of many species are yellow when first opened and turn red when they have been pollinated. Fruits are achenes with tufts of hair, properly called cypselae. Known to chemically inhibit sugar maple, red pine, tulip poplar, and black cherry. (Chick and Kielbaso, 1998)

Traditionally Aster has been a genus of about 250 species of Eurasia and North America. Some terrible subgeneric names are waiting in the wings. With hope, they won't make it into Illinois usage for a while. The new genera will include*: Doellingeria* Nees**,** *Eurybia* (Cass.) S.F. Gray; and *Symphyotrichum* Nees. North American 'asters' are now divided into 13 (15) genera. Many of these names are not new, but were in use in the 1800's and early 1900's, and will include *Ampelaster*, *Doellingeria, Eurybia, Ionactis, Oclemena, Seriocarpus*, and *Symphyotrichum*.

"The treatment of asters in Semple et al. (1996) was an attempt at an acknowledged compromise between the old and new classifications and as such is inconsistent with the most recent data. Most significant is that the molecular evidence strongly shows that there are **no true asters in North America** (members of the genus *Aster*) with one exception the arctic-alpine *Aster culminis* and that the majority of species placed in the genus by North American botanists belong in *Eurybia* Nees and *Symphyotrichum* Nees." (http://www.jcsemple.uwaterloo.ca/asters.htm, accessed February 2007)

Several species appear to be self-incompatible, including *Aster concolor, A. oblongifolius, A. ericoides*, and *A. vimineus*. Most asters will germinate with no treatment, outdoor seeding works well also. Code A or B. Seeds mature late summer to late fall. Asters are easy to transplant in spring or fall. In the garden, most benefit from division every four years. Subject to leaf spots, rusts, and mildews. (Cullina 2000).

Many asters are hosts for butterfly larvae, especially crescents and checkerspots.

"Aster L. Besides our 27 species there are a few more that are usually considered to be varieties. All are perennial and have a long flowering, closing the summer season and extending through the fall. We have seen *Aster cordifolius* in bloom on June 24th, but the first to flower regularly is the flat-topped marsh aster (*A. umbellatus)* which begins in late July. *Aster pilosus* has the longest blooming time, starting the middle of August and continuing through much of November. Asters grow in a variety of situations. Most of them are abundant, a few rare. A number of the showy asters are cultivated but asters do not often make good border material because of a tendency to run wild. This tendency to spread in disturbed soil is so marked in *A. pilosus* that nearly pure stands are common in fallow fields. Our garden was originally a Rock River bluff prairie which was invaded by oaks and later by a mixture of boxelder, elm, hackberry, ash, mulberry, locust, grape vines, and Virginia creeper. A few years of gardening with much clearing and planting of perennials and native plants was followed by a period of neglect after three years of which we found the following 7 asters growing spontaneously; *cordifolius, azureus, lateriflorus, ontarionis, oblongifolius, exiguus*, and *pilosus*.

There is such a variation of characters in some of the groups as to cause marked difficulties in identification of species. Crossing is the cause of some of this but this hybridization in asters is seldom as apparent as in such genera as verbena, violet, and willow. It seems that merging of species results in mingling of characters which is the more important factor in causing confusion." (Fell 1955)

Aster azureus Lindley SKY-BLUE ASTER, aka Azure Aster, Prairie Heart-leaved Aster (*azureus -a -um* azure, true blue, the color of deep blue, deep sky blue, from *azure*, which is derived from Old French *lazaward*, *lapis lazuli* with initial 'l' dropped as if it were French: adapted from Arabic (*al-*) *lazaward* from Persian *ljward, lzhward,* lapis lazuli, blue color, and *-eus,* made from, color, -like.)
Habitat: Hill prairies, sand prairies, moist to dry prairies, dry savanna, dry open woods.
Culture: Most crop years benefit from cold moist stratification. "No pretreatment needed. My experience suggests cold moist may be counter indicated. Ok to cold dry store. May fall sow. Light cover. Good germination. (Dunham 1993)". No pre-treatment necessary other than cold, dry stratification. Seeds germinate most successfully in cool soil. (pm 09) 30 days moist stratification improves germination, but not necessary for good greenhouse crop. Field sow fall, early spring. (pn nd)
Description/comments: Blue flowers pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera. 1.5-3.0'. Lower leaves typically heart-shaped. Blooms 7-11. Cut flowers, landscaping. 1,277,075 to 1,790,927 seeds per pound. Now called *Aster oolentangiensis* Riddell or *Symphyotrichum oolentangiense* (Riddell) G.L. Nesom.

"A common woodland aster. It has thick rough leaves, deep blue flowers and the branches of the inflorescence are stiff. It is also found on prairies, roadsides, and railroads." (Fell 1955)

Aster brachyactis RAYLESS ASTER (short-rayed, the sometimes used genus name)
Habitat: Saline roadsides. No treatment. Formerly listed in saline roadside mixes but no longer in the trade.
Description: White flowers 0.5-1.5'. Blooms 8-10. Aggressive, annual, non-native adventive our area. 4,536,000 seeds per pound

Aster cordifolius Linnaeus [new nomenclature *Symphyotrichum cordifolium* (Linnaeus) Nesom] BLUE WOOD ASTER, aka Blue Heart-leaved Aster, Common Blue Wood Aster, Heart-Leaved Aster
Habitat: Woodland clearings, rocky woods, meadows, shaded roadsides. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 5.7-7.5.
Culture: Some seed lots may benefit from cold moist stratification. 60 days cold moist stratification (pm 09). Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate.
Description: minimum root depth 10". Leaves grey-green
Comments: Blooms 8-9. 2,100,000 to 2,240,000 seeds per pound.

"This woodland aster is common. It has serrate leaves which are thin; the inflorescence is widely spreading and it blooms profusely. On dry gravel prairie hills it is common in a depauperate form." (Fell 1955)

Aster drummondii
Culture: Cold moist stratify. No pre-treatment necessary other than cold, dry stratification (pm 09).

Aster dumosus Linnaeus *IA LONG-STALKED ASTER, aka Rice Button Aster, Bushy Aster (*dumosus* bushy, of shrubby aspect, full of thorn bushes.)
Habitat: Moist or dry, usually sandy soils, moist sandy soil.
30 days cold moist stratification (pm 09).
Description/comments: Blooms 8-9. This species is becoming hard to find as seed or plants.

Aster ericoides Linnaeus *TN [new nomenclature *Symphyotrichum ericoides* (Linnaeus) Nesom] HEATH ASTER, Many Flowered Aster, White Heath Aster (*ericoides* Erica-like, heath-like, with slender branches and bracteal leaves resembling *Erica*, heath or heather.)

Habitat: Wet meadows, sand, dry and mesic prairies, degraded prairies, dry roadsides, a colonizing species
Culture: The percent dormancy varies from year to year, with some lots primarily non-dormant, with other years primarily dormant; for best results cold moist stratify. "No pretreatment needed. My experience suggests cold moist may be counter indicated. Ok to cold dry store. May fall sow. Light cover. Germination fair." (Dunham 1993) No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) USDA recommends storing dry seed at 1-2ºC for 2.5-4 months, but this is not necessary with Illinois seeds. Division of older plants also works.
Description: White flowers, occasionally pale pink, approx. 0.5" across. Pollinated by beetles. 1.0-3.0'
A key feature for this species is the bracts beneath the flower heads. They have fairly blunt points that spread out from the base. Other similar species have bracts that are either sharply pointed, or pressed against the inflorescence, or both.
Comments: Blooms 8,9,10. Cut flowers, landscaping. Attracts butterflies, songbirds and small mammals. Livestock does not eat this aster. Aggressive, pioneer species. Contrary to plants.usda.gov, the seeds are not ripe in September. Heath aster flowers very late, one of the last flowers of the year, sometimes producing little seed due to a killing freeze before seed maturity. 3,200,000 to 5,101,124 seeds per pound.

Aster furcatus Burgess [new nomenclature *Eurybia furcata*] FORKED ASTER, aka Midwestern White Heart-Leaved Aster, Starwort, Frostflower (*furcatus* furcate, forked, cleft, with two long lobes, with prong-like terminal lobes.)
60 days cold moist stratification (pm 09). "A very unusual aster found in the "dells" of Hall Creek and in Kishwaukee River gorge. The large heads and the petioled, cordate, coarsely serrate leaves are characteristic. We collected roseate flowers in the "dells" and a few years later all the flowers in the same patch were white." (Fell 1955)

Aster laevis Linnaeus [new nomenclature *Symphyotrichum laeve* (Linnaeus) A. & D. Löve] SMOOTH BLUE ASTER, aka Smooth Aster (*laevis* smooth (as in not being rough), or beardless and delicate, soft.)
Habitat: Mesic to dry prairies, and woods. Can tolerate wet mesic conditions or short durations of seasonal inundation. Prefers mesic to dry upland areas. Nutrient load tolerance low. Siltation tolerance low to moderate. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance low or none. Shade intolerant, partial to full sun. pH 5.8-7.8 (usda) or 5.0-6.5.
Culture: Easy from seed, our test results indicate cold moist stratification is usually necessary. "No pretreatment needed. May cold moist treat or fall sow. May fall sow. Light cover. Excellent germination." (Dunham 1993) No pre-treatment necessary other than cold, dry stratification (pm 09). 30 days moist stratification improves germination, but not necessary for good greenhouse crop. Field sow fall, early spring. (pn nd) Seed can be dry stored. In mixes, sow 0.02-0.125 pls lb per acre (USDA 1997). Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate. Self sows very strongly in open areas that are burned and mowed. Root cuttings.
Description: Perennial herb, 2.0-4.0', 3-5' branched stems. Lavender, violet, or blue flowers. Clasping, waxy, blue-green leaves. Minimum root depth 10".
Comments: Blooms 8-10. Cut flowers, landscaping. Used to slow storm water runoff and provide upland buffer stabilization, aggressive, self-sows. 579,451 to 1,624,329 seeds per pound. Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, Hemiptera. Attracts songbirds and small mammals. Attracts orange sulfur butterflies.

Aster lanceolatus Willdenow *NY [new nomenclature *Symphyotrichum lanceolatum* (Willdenow) Nesom] PANICLED ASTER, Eastern Lined Aster, Smooth Aster, White Panicle Aster (*lanceolatus* lanceolate, spear-shaped, lancelet-like in form, New Latin from *lancea,* lance or spear, *-ola-, -olus-,* diminutive, and *-atus*, possessive of or likeness of, for the lanceolate leaves.)
Habitat: Moist fields, roadsides, floodplains. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 6.0-8.2.
Culture: Growth rate slow. Seedling vigor low. Vegetative spread rate moderate.
Description/comments: Rhizomatous. 8" minimum root depth. 2'-5 or 6'. Blooms 8-10. Can be weedy in plantings. 700,000 seeds per pound.

Aster lateriflorus (Linnaeus) Britton SIDE-FLOWERING ASTER, aka Calico Aster, Goblet Aster (*lateriflorus* with flowers on the side, with flowers at the side, lateral-flowered)
Habitat: Wet, mesic and dry savanna; common in woods, floodplain woods, calcareous fens.
Culture: Germination is enhanced by cold moist stratification. No pre-treatment necessary other than cold, dry stratification (pm 09).
Description: White flowers, 2.0-3.0', blooms 7-10. 3,478,927 to 4,000,000 seeds per pound.

Aster linariifolius Linnaeus*IA [new nomenclature *Ionactis linariifolius* (L.) Greene The specific epithet may also be feminine.] FLAX-LEAVED ASTER, aka Stiff Aster (*linariifolius* with leaves of *Linaria*, Toad-flax)

Habitat: Sand and sandstone prairies.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). "30 days moist stratification required for greenhouse crop. Field sow fall." (pn nd)
Description/comments: Lavender flowers, 0.5-1.0'. Blooms 8-10. Cut flowers, landscaping, rock gardens, non-competitive. 1,134,000 seeds per pound.

Aster macrophyllus Linnaeus *IA [new nomenclature *Eurybia macrophylla* (Linnaeus) Cass.] BIG-LEAVED ASTER, aka *Aster à grandes feuilles*, Frostflower, Large-Leaved Aster, Lumberjack Toilet Paper, Starwort (*macrophyllus -a -um* with large leaves, having elongated leaves or leaflets, from Greek μακρος, *macros*, long; tall, high, deep, far, *-o-*, and φυλλον, *phyllon*, leaf, foliage, and *–us*, Latinizing suffix.)
Habitat: Mesic to dry savannas, dry to moist, open woods, thickets, and clearings, rich sandy woods, white oak woods. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium, best in rich soils. Salinity tolerance none. Shade tolerant. pH 4.9-6.9.
Culture: Cold moist treatment, or fall sow. Light cover. Excellent germination. (Dunham 1993) 60 days cold moist stratification (pm 09). No treatment is necessary (van der Grinten 2001). Our test data indicates cold moist stratification is required. Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.
Description: Rhizomatous, 12" in our area, but in other parts of its range to 4'. Lavender to violet flowers. Large, heart-shaped fuzzy foliage.
Comments: Blooms 7-9. 432,000 to 854,991 seeds per pound. A good woodland ground cover. A colonial aster that may slowly form large patches, with only a few of the plants in each patch flowering every year. Some clones may not flower every year. "Found in Boone County in a woods on Rt. No. 173 east of Argyle near our line but we have not seen it in Winnebago County." (Fell 1955)

Aster novae-angliae Linnaeus [new nomenclature *Symphyotrichum novae-angliae* (Linnaeus) Nesom] NEW ENGLAND ASTER, aka Aster, First Flower, Starwort (*novae-angliae* of or from New England, the northeastern U.S.A.)
Habitat: Wet meadows, wet to mesic prairies, degraded prairies, mesic and dry savannas. Moderate to high water requirement, full sun to partial shade. Wet thickets, alluvial woods, streams, meadows, and swamps. Moist sites with full sun to partial shade. Medium to high moisture requirements. Moderately coarse to fine soils. Moist soil to wet-mesic conditions. Limited inundation tolerance. Mature plants tolerate short periods of shallow flooding in natural areas, but not in constructed wetlands. Nutrient load tolerance moderate. Salt tolerance low. Siltation tolerance moderate. Partial to full sun. Neutral to acidic soils, pH 5.5-7.0. distribution Native to much of central and eastern USA.
Culture: No treatment (usually), easy from seed. Many crop years show zero dormancy, but there are occasional lots with an absolute requirement for cold moist stratification. Cold moist stratification at 34-40ºF for 30-40 days gives optimum germination (usda). "No pretreatment needed, or fall sow. Experience suggests cold moist treatment may benefit germination. Excellent germination. Light cover. Self sows abundantly in most sites." (Dunham 1993). 60 days cold moist stratification (pm 09). "Fresh seed or dry stored seed can give very high germination rates in 3-8 days. Moist stratification improves germination. Fall plant with light cover outdoors or in cold frame works well" (USDA, 1997). 30 days moist stratification improves germination, but is usually but not always necessary for good greenhouse crop. Field sow fall, early spring. (pn nd) Seeds need light, plant 1/8" deep, temperature sensitive*. Germinating seedlings killed by 2 days of inundation. Reseeds itself in open ground. Plant 0.8 oz per 1,000 ft. sq. (Stocks). Pure stand plant 2 lb per acre (granite). In mixes plant 0.03(.04)-0.2 pls lb per acre (USDA 1997). Seeds, plugs, and bare-root plants readily available commercially. Greenhouse plants or production plots may be subject to various forms of stem-rot.

Mature plants can be divided in late fall or early spring, or in the spring every three years (Heuser, 1997) Stem cuttings in spring and early summer can be rooted in sand, gel mix, or rockwool. Specimen plants can be pinched back before July to encourage branching and a more compact plant.

Aster novae-angliae should not be burned after it has broken winter dormancy.
Description: One of the larger and showiest wildflowers. Native perennial herb, 2.0-5.0' with lavender to purple-blue flowers with yellow centers. Some nursery strains exhibit high incidence of light blue, pink and even white individuals. White individuals may be short-lived. The flower stalks and bracts at the base of each flower head are covered with glandular-tipped hairs.
Comments: Blooms 7-10, until frost. Excellent cut flowers in fall. Ethnobotanical uses. Useful in landscaping, roadside seedings, prairie and wetland seedings on moderate side slopes, used in upper shoreline zones and for upper slope stabilization. Pioneer species, can be aggressive, sometimes forming monocultures. 1,056,000 to 2,058,956 seeds per pound.

"A very common and showy aster that is found mostly in prairie situations. Occasionally the flowers are rose colored. Its marked tendency to spread lessens its value as a garden plant." (Fell 1955)

Associates: Pollinated by bees, butterflies, flies, beetles, and moths. The larval host of the Pearl Crescent, *Phycoides tharos.* Attracts butterflies, bees, honeybees, songbirds and small mammals, provides food and cover for waterfowl and gamebirds. Appears to be somewhat rabbit-resistant.

Aster novi-belgii Linnaeus [new nomenclature *Symphyotrichum novi-belgii* (Linnaeus) Nesom] MICHAELMAS DAISY, aka New York Aster (*novi-belgii* of or from New York, at one time called New Belgium.)
Habitat: Swamps and moist meadows. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade intolerant. pH 5.5-7.0.
Culture: 60 days cold moist stratification (pm 09). Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate.
Comments: Blooms 700,000 to 856,000 seeds per pound.

Aster oblongifolius Nuttall *IN, OH [new nomenclature *Symphyotrichum oblongifolium* (Nuttall) Nesom] AROMATIC ASTER, aka Shale Barren Aster (*oblongifolius* with oblong leaves, from Latin *oblongus, oblong*, longer than wide, oblong, *-i-,* and *folium*, leaf.)
Habitat: Sand and dolomitic limestone prairies. Dry open savannas. Calcareous hillsides and cliffs.
Culture: "No pretreatment needed, or fall sow. May be cold moist stratified. Light cover. Good germination" (Dunham 1993). No pre-treatment necessary other than cold, dry stratification (pm 09).
Description: Rich purple to violet flowers. 1.0-2.0', slightly branched stems.
Comments: Blooms 8-10. Cut flowers, landscaping. Can be aggressively rhizomatous in good soil, but slow to spread in sterile, sandy soils. Calcareous. This species does well in older, stable, dry, sandy road cuts in Bureau and Whiteside cos. 816,000 to 2,268,000 seeds per pound.

"A high prairie plant that is found most often in such situations on roads and railroads. Not very common. Also found in Boone and DeKalb counties." (Fell 1955)

Aster ontarionis Weigand OH* ONTARIO ASTER, aka Bottomland Aster, *Aster du Lac Ontario*. (*ontarionis -is -e* of Ontario, Canada.)
Habitat: Moist meadows, marshes, shores. "Often shaded, usually moist, alluvial soils, alluvial stream or lake shores, floodplain deciduous forests or thickets, bogs, marshes, edges of fields, roadsides" (fna). Open woodlands, woodland openings, woodland borders, partially shaded cliffs, along woodland paths, powerline easements in wooded areas, savannas, moist meadows, and abandoned fields (Hilty). 'Typically found on moist calcareous soils" (Eckel 1996). At Genesis, it grows naturally in a mesic Osage Orange hedgerow (a county record).
Culture: 2009 crop year seed is non-dormant, no treatment needed.
Description: Form Erect perennial, 1-4' tall, stems evenly covered with fine curly hairs, mostly towards the top, leaves lower surface evenly hairy, lance-like, basal leaves stalked, upper leaves mostly stalkless. Capitulescence inflorescence of many heads along spreading branches Flowering heads head white, 1/3"-1/2" wide, 9-14 rays N 2n = 32 key features Similar to *A. lateriflorus,* but with long, creeping rhizomes, shorter disc corolla lobes, and hairy lower leaf surfaces evenly hairy.
Comments: Blooms August to October. A colonial aster. 4,495,049 (gni2009) seeds per pound.

Aster oolentangiensis Riddell (*oolentangiensis* of or growing near the Oolentangy River in Ohio.) See *Aster azureus.*

Aster pilosus Willdenow *NY (in part) [new nomenclature *Symphyotrichum pilosum* (Willdenow) Nesom] FROST ASTER, aka Awl Aster, Hairy Aster, Hairy White Oldfield Aster, White Heath Aster (*pilosus*, *pilosa* shaggy, soft hairy, with soft hairs, with long soft hairs, from Latin *pilosus, pilos*, hairy, shaggy, pilose.)
Habitat: Degraded hill and sand prairies, dry to mesic prairies. A weedy member of native communities, degraded prairies and disturbed areas. Invasive and persistent. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 5.4-7.0.
Culture: As a weed in restorations, why propagate this? Cold dry storage may be ok, as some lots have zero dormancy. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). "30 days stratification required for green house crop. Field sow fall." (pn nd) Growth rate moderate. Seedling vigor low. Vegetative spread rate rapid.
Description: WEED! White ray flowers, with yellow disk flowers aging to red. 1.5-3.0' 10" minimum root depth.
Comments: WEED! Considered invasive in parts of its range. Blooms 8-11. Cut flowers, aggressively self sows. Attracts songbirds and small mammals. Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera. Anyone with more then a few brain cells to rub together and an ecologic conscious does not use this except in bio-remediation or the most severe reclamation sites. 2,240,000 to 3,040,000 seeds per pound.

Aster praealtus Poir**.** WILLOW ASTER, aka Veiny Lined Aster, Willow-leaved Aster (*praealtus* very tall or very deep.)

Habitat: Mesic prairie, moist ground, common.
Culture: Cold moist stratification benefits most lots. 30 days cold moist stratification (pm 09).
Description: 4.0-6.0'.
Comments: Special concern in Michigan. Attracts songbirds and mammals. Does not play well with other plants. *Aggressively rhizomatous to the point of being undesirable, plant only in the back forty.* Plantings quickly fill in and produce few flowers. 1,664,000 to 3,109,589 seeds per pound.

Aster prenanthoides Muhlenberg ex Willdenow *CT, MA [new nomenclature *Symphyotrichum prenanthoides* **(**Muhlenberg ex Willdenow) Neesom] CROOKED-STEMMED ASTER, Crooked Aster, Zigzag Aster (*prenanthoides* New Latin, from Greek *prenes* drooping, face downward, prone (akin to *pro* before, forward) and New Latin -*anthes, -anthos*, flower, for the drooping flower heads, and -*odes*, resembling, like, of the nature of.)
Habitat: Damp thickets, rich woods, shores and bottoms. North-facing slopes in rich woods. Moist to moderate moisture, meadows, woods, stream banks (Freckmann). Moist or swampy ground, woods, thickets, meadows, seeps, stream banks, roadsides. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade intolerant. pH 5.5-7.2.
Culture: Cold moist stratify 60 days (Wade). Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). Cold moist stratification benefits many lots. Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate.
Description: Rhizomatous. 2-3 or 4'. Blue –violet flowers, rarely white in *forma milwaukeensis*. Resembles some forms of *A. laevis*. 10" minimum root depth. 2n = 32.
Comments: Blooms 8-10. 1,920,000 to 2,203,883 seeds per pound.

Aster ptarmicoides (Nees) Torrey & Gray *CT, IN, MA, NH, NC, OH, TN [*Solidago ptarmicoides* (Nees) Bolvin] PRAIRIE GOLDENROD, aka Snowy Aster, Stiff Aster, Upland White Aster, White Upland Goldenrod (*ptarmicoides* ptarmica-like, for resemblance to *Achillea Ptarmica,* sneezewort, from a Greek name for a plant which caused sneezing, and was used for snuff, the sniffed, not smokeless tobacco kind.)
Habitat: Sandstone, sand and limestone prairies. Dry calcareous hill prairies, calcareous sand flats close to Lake Michigan.
Culture: "No pretreatment needed. My experience suggests cold moist treatment may be counter indicated. May fall sow. Light cover. Good germination." (Dunham 1993) No pre-treatment necessary other than cold, dry stratification (pm 09). Fall plant or 30 days moist stratification required for greenhouse crop. Field sow in fall. (pn nd) Division of mature clumps.
Description: White flowers, 0.7-2.0'.
Comments: Blooms 6-10. Cut flowers, landscaping, rock gardens, non-competitive. 1,024,000 to 1,120,000 seeds per pound. It is politically incorrect to not place this in *Solidago*. *Oligoneuron* doesn't seem to be catching on much. This plant has been placed in six genera; *Aster*, *Doellingeria*, *Inula*, *Oligoneuron*, *Solidago,* and *Unamia*. Known to hybridize with many *Solidago* species in the section *Oligoneuron*.

Aster puniceus Linnaeus var. **puniceus** [new nomenclature *Symphyotrichum puniceum* (Linnaeus) A. & D. Löve var. *puniceum*] SWAMP ASTER, aka Purplestem Aster, Red-Stemmed Aster (*puniceus* reddish purple, purplish crimson, scarlet, carmine, from Latin *puniceus* reddish, purple, for the stem, classical Latin *pūniceus* bright red, scarlet, crimson, from *Pūnicus* Punic, Carthaginian)
Habitat: Calcareous fens, wet meadows, riverbanks. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none Shade intolerant. pH 4.5-7.5.
Culture: Cold moist stratify or fall plant will slightly to greatly improve germination of most lots. Rarely lots have low or zero dormancy. "Cold moist treatment, or fall sow. Light cover. Very good to excellent germination." (Dunham 1993) 60 days cold moist stratification (pm 09). Growth rate slow. Seedling vigor medium. Vegetative spread rate slow.
Description: Purple flowers, 3.0-5.0' 10" minimum root depth.
Comments: Blooms 8-10. Ethnobotanical uses, wetland restoration. Provides nectar for butterflies and browse for deer. 931,282 to 2,414,894 seeds per pound.

"A rather tall late flowering aster that is frequently found in wet places. Typically it is a robust plant with a pubescent stem, auricled, serrate, lanceolate leaves and large pale flowers. It is subject to great variation particularly when growing in dense clumps or in tall grasses or sedges. Kent Creek bottom near Winnebago, the Searle tract, North Springfield avenue road at Porter road, and in boggy places in Coon Creek bottom. Also in Boone, Ogle, De Kalb and Stephenson counties." (Fell 1955)

Aster puniceus Linnaeus var**. firmus** (Nees) Torrey & Gray *NJ, NY, PA SHINING ASTER, aka Cornel-Leaved Aster, Shiny-leaved Aster (*firmus* Latin firm, hard, strong, stout; lasting, valid; morally strong.)
Habitat: Found in habitats similar to those of *A. puniceus,* though more frequent and more likely to grow in wet prairies (Swink & Wilhelm 1994)

Culture: 60 days cold moist stratification (pm 09).
Comments: This variety is scarcely distinct from the typical variety, according to Shinners (1941b). He states: "It is not always very easy to distinguish the two. Characteristics of the internodes, leaves, pubescence, panicles, heads, and style branches are sufficiently inconsistent to make it possible to rely upon any of them." 1,760,000 seeds per pound.

Aster sagittifolius Willdenow (or Wedemeyer ex. Willdenow) [new nomenclature *Symphyotrichum urophyllum* (Lindl.) Nesom] ARROW-LEAFED ASTER, aka Sagittate Aster, White Wood Aster (arrow-leafed, from Latin *sagitta,* an arrow, *-i-,* and *folium,* leaf.)
Habitat: Mesic and dry savanna, woodlands, prairies, and oak openings.
Culture: Cold moist stratify/fall plant is required for a good greenhouse crop. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description/comments: Blue flowers 4.0-6.0'. Blooms 8-11. Cut flowers, landscaping, aggressive. 1,174,644 to 1,609,929 seeds per pound. "A tall erect woodland aster which has a compact inflorescence with an abundance of small, blue, pink, or white flowers. The petioles of the arrow shaped leaves are, for the most part, winged." (Fell 1955)

Aster sagittifolius Wedemeyer ex. Willdenow var. **drummondii** (Lindl.) Shinners *OH DRUMMOND'S ASTER (*drummondii* named for the Scottish plant-collecting brothers James Drummond, 1786-1863, and Thomas Drummond, 1793 (1790)-1835, Thomas like his countryman David Douglas made an ill-fated collecting trip to North America.)
Habitat: Mesic savannas, dry open woods, open disturbed woodland, abandoned fields, and pastures.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment. Self sows in full sun, average soils, somewhat mobile.
Description: Blue flowers. 1.5-3.0' Stems evenly and densely pubescent.
Comments: Blooms 8-10. Cut flowers, landscaping. Early successional, stands may be short-lived. 1,280,000 to 2,144,208 seeds per pound.

"*A. drummondii* Lindl. Not uncommon. Usually in woods as Memorial Forest Preserve and Kishwaukee River bank on River road south of Cherry Valley. (*A. sagittifolius* var. *drummondii* (Lindl.) Shinners)." (Fell 1955)

Very tempting to call this *A. drummondii* Lindl. just to reduce paperwork.

Aster sericeus Vent. *IN, MI SILKY ASTER, aka Western Silver Aster, Western Silvery Aster (*sericeus -a -um* silky, bearing silk, covered with silky pubescens.)
Habitat: Sand and limestone prairies, dry hill prairies, sand barrens.
Culture: Cold moist stratify or fall plant improves germination. "Cold moist treat, or fall sow. Germination best on cool soils; sow early spring or late fall. Light cover. Good to fair germination." (Dunham 1993) 60 days cold moist stratification (pm 09). Cool soils.
Description/comments: Purple flowers. 1.0-2.0'. Blooms 8-10. Cut flowers, landscaping. 563,275 to 912,000 seeds per pound.

Aster shortii Lindley in Hooker SHORT'S ASTER, aka Aster, Midwestern Blue Heart-leaved Aster, Starwort, Frostflower (*shortii* for Charles Wilkins *Short*, 1794-1863, physician and botanist.)
Habitat: Calcareous woodlands, sloping rocky woodlands, mesic savanna, open woods, thickets, rocky slopes, mesic woods, and limestone bluffs.
Culture: "Cold moist treatment, or fall sow. Light cover. Good germination, but not reliable." (Dunham 1993) 30 days cold moist stratification (pm 09). Our test results indicate cold moist stratification is required.
Description/comments: Blue flowers. 1.0-2.0'. Blooms 8-10. Ethnobotanical uses, attracts butterflies. 960,000 to 1,401,235 seeds per pound.

"Not uncommon in woods in Shirland Township, the "dells" of Hall Creek, and the woods west of Ingersol park in West Rockford." (Fell 1955)

Aster simplex Willdenow [new nomenclature *Aster lanceolatus* Willd.] MARSH ASTER, aka Panicled Aster (*simplex* unbranched, simple.)
Habitat: Wet meadows, mesic prairies; prefers moist to saturated soils. Mature plants tolerate short periods of shallow flooding. More flood tolerant than *Aster novae-angliae.* Nutrient load tolerance moderate. Salt tolerance moderate. Siltation tolerance high. Partial to full sun. pH tolerance not available.
Culture: Cold moist stratifying may benefit some seed lots, but good crops are possible with out stratification. Non-dormant lots are known. Fall sow light cover works. No pre-treatment necessary other than cold, dry stratification (pm 09). Germinating seedlings are killed by 2 days of inundation. Mature plants can be divided in late fall or early spring. Seeds, bare root, and plugs readily available commercially. USDA (1997) recommends 0.06 pls lb per acre seeding rate.
Description: Perennial herb, 2.0-4.0', white flowers. Blooms August to September. Provides waterfowl cover. Wetland restoration, useful in upper slope stabilization and in vegetated swales; can be very weedy and aggressive. 3,120,275 to 4,053,571 seeds per pound.

Aster tanacetifolius PRAIRIE ASTER
Habitat: Drought tolerant, full sun to partial shade. Native to dry, rocky hillsides and open sandy areas, from the Southwest to the Prairies. Elevations 5000-8000'. Sandy or lighter soils in full sun. Coarse to moderately fine soils. Neutral to basic soils.
Culture: Sow in spring or fall in sandy soil Plant 2 oz. per 1,000 ft. sq. (Stocks) Pure stand plant 6 lb per acre (granite).
Description: Western USA native annual, 1.5-2', with, bright violet, purple, to lavender daisy like flowers with yellow centers June to October, summer. Occasionally specified in Illinois mixes, due to confusion of common name, compare with *A. turbinellus*. 496,000 seeds per pound.

Aster turbinellus Lindley in Hooker *IA [new nomenclature *Symphyotrichum turbinellum* (Lindl.) Nesom] PRAIRIE ASTER, aka Aster, Smooth Violet Prairie Aster (somewhat top-shaped, from Latin *turbinatus*, cone-shaped (like a tornado or spinning top), and *–ellus,* diminutive.)
Habitat: Dry prairies, dry savanna, prairies, dry open woods, southern 3/5 of Illinois.
Culture: 30 days cold moist stratification (pm 09). Cold moist stratify or fall plant, division.
Description: Blue flowers, 1.5-3.0'. Blooms 9,10. Landscaping. Native south of our area. 348,912 to 560,000 seeds per pound. Often misused in Illinois as an "annual" species because of the common name confusion, compare *A. tanacetifolius*.

Aster umbellatus Miller [new nomenclature *Doellingeria umbellata* (P. Mill.) Nees] FLAT-TOP ASTER. aka Parasol Aster (*umbellatus -a -um*, in umbells, umbrella-like flower heads, from Latin *umbella, umbell*, umbrella, "a little shadow", and *-atus*, possessive of or likeness, for the flowers appearing to be in umbels.)
Habitat: Wet meadows, mesic savanna, boggy or peaty low areas, and calcareous fens. Swamps, low woods, terrace woodlands. Moderate shade tolerance.
Culture: Cold moist stratify/fall plant is required for a good crop. "Cold moist treatment or fall sow. Light cover. Very good germination." (Dunham 1993) 60 days cold moist stratification (pm 09). Without stratification, germination was only 15% (van der Grinten 2001).
Description: Cream flowers in corymbiform heads. 1.0-5.0' said to reach 8' in parts of its range. Rhizomatous, forms small colonies. Although this species has a four-parted pappus, it is in the section *Triplopappus.*
"The x=9 genus *Doellingeria* includes only three species all native to eastern North America. The genus is distinguished by its fruit pappi, phyllaries, inflorescence shape and the brachidodromous leaf venation. Cypselae (achenes) have a quadruple pappus consisting of: 1) short bristly scales (secondary outer series), 2) mid length bristles with attenuate tips (secondary inner series), 3) longer bristles with attenuate tips (primary outer series), and 4) the longest innermost bristles with strongly clavate (flattened and widened) tips." (Semple & Hood in press, from http://www.jcsemple.uwaterloo.ca/Doellingeria.html).
Comments: Blooms 7-10. Cut flowers, ethnobotanical uses, landscaping. 800,000 to 1,072,000 seeds per pound.
Associates: The larval host of Harris' Checkerspot, *Chlosyne harrisii*. This butterfly and its host have the same range.

BIDENS Linnaeus 1753 **Beggars-tick, Bur-marigold** *Bidens* From New Latin, from Latin, *bis, bi-* bi-, two and *dent-, dens* tooth, having two teeth, for the two pronged pappi of the original species. There is some question of the gender of the name *Bidens*. A genus of about 240 species of herbs native to the warmer and temperate parts of both hemispheres that have divided or compound leaves and yellow flowers, usually flattened achenes that are typically armed with barbed awns. Closely related to *Coreopsis*. Reseeding annuals in disturbed wetlands, early successional, can be persistent on disturbed wetlands. Seeds require light, those buried too deeply do not germinate. Fruit is an achene usually with prongs. *Bidens* provide food and cover for wildlife and waterfowl.
In some parts of the United States, several species are considered invasive.

Bidens aristosa (Michaux) Britton SWAMP MARIGOLD, aka Bearded Beggarticks, Long-Bracted Beggars-Tick, Midwestern Tickseeded Sunflower (*aristosus* bearded, with bearded awns like the ear of Barley, furnished with awns, bristly, from Latin *aristosus*, with many beards, similar to those on the seed heads of some grasses, or New Latin, irregular from Latin *arista* beard of grain.)
Habitat: Low ground. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.0-7.0.
Culture: Requires stratification and should be planted August to October for germination the following spring. 60 days cold moist stratification (pm 09). Growth rate rapid. Seedling vigor high. Vegetative spread rate none.
Description: Annual, 1-5' with a taproot. Bright yellow 1-2" flower heads. 8" minimum root depth.
Comments: This plant is considered invasive in some areas. Blooms August to September. 81,165 to 228,571 seeds per pound.

Bidens cernua Linnaeus BUR MARIGOLD, Nodding Beggarsticks, Nodding Bur Marigold, Sticktight (*cernuus -a -um* drooping, nodding, down turned, like the flowers of *Narcissus*, from Latin, *cernuum*, nodding, from *cernuus, cernu-*, inclining the head, stooping.) Also seen as *B. cernuus*.
Habitat: Seasonally inundated areas, wet meadows, upland swamps, wet shores, and drainage ditches. Saturated soils, tolerates seasonally flooded conditions for short durations. Nutrient load tolerance moderate. Siltation tolerance moderate to high. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none or low to moderate. Shade tolerant intermediate, partial to full sun. pH 5.1-7.0.
Culture: Said to require cold moist stratification @ 34-36°F for several months for optimum germination. 60 days cold moist stratification (pm 09). Seeds require light. Someone recommended that seeds are to be broadcast on wet mudflats or shorelines and raked into soil. That consultant is an idiot and has never raked a wet mudflat. Better to fall plant after draw down to allow natural stratification during winter. Drawdown the following summer produces good response. Once populations are established, early summer shallow flooding followed by drawdown gives best seed production. In mixes seed up to 0.5 pls lb per acre (USDA 1997), but that is considered too expensive. Seeds are available commercially, as are plants. As this is an annual, plants are not cost effective! Growth rate rapid. Seedling vigor high. Vegetative spread rate none.
Description: Annual emergent herb, 0.25-3.3'. Nodding yellow flowers followed by three-pronged sticktights. 8" minimum root depth. 2n = 24, 48.
Comments: In some parts of the United States, this plant is considered invasive. Blooms 8-10. Wetland restoration, good pioneering species in upper shoreline zones and vegetated swales. Provides wildlife cover. Waterfowl, shorebirds, songbirds, and small mammals eat seeds. Annual, sticktights. 328,000 to 477,141 seeds per pound.

Bidens connata Muhl. ex Willd. PURPLE-STEMMED TICKSEED, aka *Bident conné*, Purple-stemmed Tickseed. (*connatus -a -um* connate, twin, united, congenitally or subsequently, united in pairs at the base.)
Culture: Cold moist stratify 60 days or direct sow in fall when soil temperature is below 54 degrees (Wade)
2n = 48. 160,000 seeds per pound.

Bidens coronata (L.) Britton (or Britton ex Sherff) TICK-SEED SUNFLOWER, aka Northern Tickseed-sunflower, Tall Swamp Marigold.
Cold moist stratify 60 days or direct sow in fall when soil temperature is below 54 degrees (Wade)
Description/comments: Annual (or biennial). 2n = 24. 142,800 to 240,000 seeds per pound.

Bidens frondosa Linnaeus COMMON or DEVIL'S BEGGARS TICK, aka Bur Marigold, Devils Bootjack, Pitchfork Weed, Sticktights, Tickseed Sunflower (*frondosus -a -um* leafy, leaf-like, leaf-bearing, covered with foliage, for the outer involucre.)
Habitat: Seasonally inundated areas, wet meadows. Prefers moist soil, 75-90% moisture content, but it is weedy enough to occur in drier areas. Nutrient load tolerance moderate. Siltation tolerance high. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance variously none (plants.nrcs.usda.gov) or moderate to high. Shade tolerance intermediate. partial to full sun. Wide pH range, 5.2-7.2.
Culture: Said to germinate better after several months cold moist stratification @ 32-34° and spring planted. 60 days cold moist stratification (pm 09). Fresh or dry stored seed may be late fall or early winter planted (dormant seeded) and lightly raked into the soil for germination the following spring. Light. Young plants have little tolerance for flooding and are killed by inundation of 1-2" for 2-3 days. Mature plants are more tolerant of some flooding. Seeds are somewhat commercially available, not widely so. Mid to late season (May to July) drawdown in constructed wetlands mimics natural water level fluctuations and stimulates seed production. In mixes sow up to 0.125 pls lb per acre (USDA 1997).
Description: Annual. Yellow flowers followed by two-pronged sticktights. 2.0-3.0(4)'. Minimum root depth 8". 2n = 24, 48, 72.
Comments: In some parts of the United States this plant is considered invasive. Blooms 6-10. Wetland restoration, used in upper shoreline zones, upland slope buffer, and vegetated swales; Provides food and cover for wildlife. Seeds are eaten by mallard ducks and ruffed grouse. Plants eaten by muskrats, upland gamebirds and songbirds. Seeds are stick tights. 80,000 to 129,714 seeds per pound.

Bidens polylepis S.F. Blake BUR MARIGOLD, aka Ozark Tickseed-sunflower (*polylepis* with many scales.)
Habitat: Seasonally inundated areas.
Culture: Cold moist stratify or fall plant
Description: Annual/biennial. Yellow flowers 3.0-4.0'. 2n = 24.

Comments: Blooms 9,10. Wetland restoration. This species is considered a variety [*B. aristosa retrorsa*] or synonymous with *Bidens aristosa*. Compared to other *Bidens*, this species is user friendly. 228,571 (gni) seeds per pound.

BOLTONIA L'Héritier 1789 **Doll's Daisy, False Aster** In honor of James Bolton, *fl.* 1750s to 1799, English botanist and artist. Seeds are small achenes with small tufts of hair. Five (6-7) species in eastern and central North America. x = 9.

Largely self-incompatible. Cold moist stratify. Code B. (Cullina 2000)

Boltonia decurrens (Torr. & Gray) Wood *US, IL, MO DECURRENT FALSE ASTER, aka Clasping-leaf Doll's Daisy (decurrent, with leaves extending down the stem as wings)
Habitat: Disturbed alluvial habitats, open soil in wet prairies and wet savannas, disturbed wet lakeshores. distribution Illinois, Iowa, and Missouri. Not mapped from Iowa by fna.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify, light, division.
Description: 3.0-6.0', White daisies. Base of cauline leaves decurrent; rhizomes and stolons absent. 2n = 18.
Comments: Blooms 7-9. Seeds mature fall. Landscaping. Attracts butterflies. Produces offsets. An Illinois endemic?, native to the Illinois River floodplain and Mississippi River floodplain in Missouri, although Dobbs collected it in Henry County, Illinois. 2,400,000 to 4,536,000 seeds per pound.

Boltonia latisquama A. Gray **recognita** Fernald & Griscom *MI FALSE ASTER, False Starwort, White Doll's-daisy, Asterlike Boltonia (*latisquamus -a -um*, with broad scales, *recognita*, restudied, reconsidered)
Habitat: Seasonally inundated areas, upland swamps, mesic prairies, gravelly shores, streams, agricultural wetlands, roadside ditches.
Culture: Cold moist stratify, seeds need light. "Cold moist treatment, or fall sow. Light cover. Good germinator." (Dunham 1993) 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Division of mature clumps.
Description: 3.0-5.0'. White daisy flowers. 2n = 36.
Comments: Blooms 8-10. Seeds mature fall. Landscaping, wetland restoration. Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera. Attracts butterflies, gamebirds, songbirds, and small mammals. 1,600,000 to 5,072,626 seeds per pound.

"*Boltonia asteroides* (L.) L'Her. This grows sparingly on a slough bank west of Shirland. We have found it in no other place in the county but it is not uncommon in Pecatonica River bottom north of Riddott in Stephenson County." (Fell 1955)

Boltonia asteroides (Linnaeus) L'Héritier var. *recognita* (Fernald & Griscom) Cronquist

BRICKELLIA Elliott 1823 See *Kuhnia* **False Boneset** New Latin, from John Brickell *fl*1730 Irish-American physician and naturalist, and New Latin suffix *–ia*. Herbs of the warmer regions of America having greenish or yellowish white flowers with a pappus of slender bristles.

CACALIA Linnaeus New Latin, from Latin, a very old plant name, used by Dioscorides, κακο-λιαν, *kako-lian,* very-hurtful; or from Greek *kakalia, kakkalia*. Tall smooth herbs with alternate, often-petioled leaves and large heads in flat corymbs. This genus is more attractive in bud than in bloom. Sometimes New World species have been placed in the genera *Arnoglossum, Hasteola,* or *Mesadinia. Arnoglossum,* from Greek for *arnos*, a lamb, and *glossum, glôsso,* tongue. *Hasteola,* spear-shaped, from Latin *hasta*, (*asta*), a spear, lance, pike, javelin.

Cacalia atriplicifolia L. PALE INDIAN PLANTAIN (*atriplicifolius -a -um* with leaves of *Atriplex,* orache)
Habitat: Wet prairie, wet and mesic savannas.
Culture: 60 days cold moist stratification (pm 09). 30 days moist stratification improves greenhouse germination, but not necessary. Field sow fall, early spring. (pn nd)
Description: 3.0-6.0'. White buds and flowers. 2n = 50, 52, 56.
Comments: Blooms 7- 10. Landscaping aggressive, self sows. 96,000 to 104,000 seeds per pound.

Cacalia muhlenbergii (Sch. Bip.) Fernald GREAT INDIAN-PLANTAIN, aka Muehlenberg's Cacalia
Culture: Cold moist stratify for 60 days (Wade).
Description: 64,000 seeds per pound.

Cacalia plantaginae (Raf.) Shinners *MI,WI PRAIRIE INDIAN PLANTAIN
Habitat: Hill prairies and wet meadows.

Culture: Cold moist stratify or fall plant, thrives with division.* "Sow in flats in fall and over winter, or fall sow. Cold moist treatment is recommended but in my experience, fall sowing is better. Light cover. Unreliable and low germination." (Dunham 1993). 60 days cold moist stratification (pm 09).
Description: 3.0-4.0'. White buds and flowers.
Comments: Blooms 6-8. Landscaping, short lived without division. Some one or something must have eaten these tubers, keeping them in a "semi-cultivated" state. Don't laugh, bears do this with tuberous species out west. Produces numerous offsets. It may be finicky about pollinators. It sets abundant seed on one farm, but little in another farm. 75,200 to 111,262 seeds per pound**.** Our original plants were salvaged by NRCS District Conservationist Don Presztch (a plant materials specialist) from a south facing hill prairie/oak woodland on the moraine in Greenville Township, Bureau County. Side Oats Grama was growing with the plantain.

Cacalia suaveolens Linnaeus * IA, WI SWEET INDIAN PLANTAIN, aka Hastate Indian-Plantain (*suaveolens* sweet smelling, fragrant, from Latin *suavis* pleasant, sweet.)
Habitat: Wet meadows, rich or low woods, base of rich slopes or bluffs, calcareous fens. Neutral to calcareous soils.
Culture: "Cold moist treatment, or fall sow. Light cover." (Dunham 1993) 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant, division in spring.
Description: White (ochroleucous) flowers, rarely pinkish. 4.0-5.0'. 2n = 40.
Comments: Blooms 8-9. Wetland restoration, mildly aggressive. 224,000 to 571,788 seeds per pound.
"*Hasteola suaveolens* is now less common or absent in the northeastern part of its historic range" (fna). Weakley (2008) notes this species has not been seen in North Carolina in recent years.

CENTAUREA Linnaeus 1753 **Star-thistle, Knapweed, Cornflower, *Centaurée*** *Centaurea* New Latin, genus name, *Centaurea* from Medieval Latin, from Greek, *kentaurieon, kentaur*, a centaur, half-man, half-horse, an ancient plant name associated with Chiron (*Kheiron*), a centaur famous for his knowledge of medicinal plants. Chiron is said to have discovered the medicinal uses of plants, and was the tutor of Achilles (*Akhilleus*), Asclepiaus, Hercules, Dionysus, and others. Where native, some *Centaurea* species have a long history of medicinal use. A large genus (500 species, 20 in North America) of composite herbs native to Eurasia and North Africa, including several cultivated for their showy heads of tubular florets. Several aggressive weedy species. x = 8,9,10,11,12,13,15.

Centaurea biebersteinii DC. #NOX SPOTTED KNAPWEED, aka Bachelor's Button, Blue Bottle, Born Flower, *centaurée maculée ou tachetée, gefleckte Flockenblume,* Hard Head, Star Thistle. (*biebersteinii* for Baron Friedrich August Marschall von *Bieberstein*, 19th century German explorer in southern Russia.)
Habitat: Disturbed sites, dry prairies, calcareous soils. distribution Native to southeastern Europe.
Description: Form erect biennial or perennial, 1-4' leaves pinnately-divided into narrow lobes capitulescence inflorescence a solitary head at the ends of the many branches flowering heads 1" wide with pink to purple disk flowers, starry, loosely thistle-like phyllaries fringed with black N 2n = 36 (polycarpic, perennial tetraploid) key features bracts or phyllaries fringed with dark brown or black 'eyelashes', leaves pinnate with narrow lobes.
Comments: Status Introduced, naturalized, invasive. A listed species in 16 states. Blooms June to October. C3. Spotted Knapweed was introduced to both coasts in alfalfa seed in the late 1800's. Plants produce a chemical killing nearby plants. To eradicate, wear gloves to pull or dig to protect from skin irritation; hot burns; herbicide specific to broadleaf or composite weeds.
Not only is this an aggressive, invasive species in natural areas, pastures, and roadsides, Spotted Knapweed has been shown to reduce DNA of soil fungus by 80%. The restoration of contaminated areas may need to include mycorrhizal remediation.

CHRYSANTHEMUM Linnaeus 1753 **Chrysanthemum** Latin, from Greek *chrysanthemon*, from *chryso, chrysos*-, gold, and *anthemon* flower, akin to Greek *anthos* flower. Date: 1548. Genus including weeds, ornamentals grown for their brightly colored often double flower heads, and others important as sources of medicinals and insecticides. Often split into *Chrysanthemum, Glebionis, Leucanthemum*, and *Tanacetum*.

Chrysanthemum leucanthemum Linnaeus NOX OXEYE DAISY, Common Daisy, Field Daisy, Marguerite, Poorland Flower, White Daisy, Whiteweed. (New Latin *leucanthemum*, white flowered, from *leucos*, bright, brilliant, clear, white, pale , *anthemon*, flower, and *–us,* Latinizing suffix.)
Habitat: Low to moderate water requirement. Tolerant of most soil textures. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. Full sun to partial shade. pH 5.2-7.0.
Culture: No special treatment. Pure stand plant 6 lb per acre (granite). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description: Introduced perennial, 2-4'. White daisy-like flowers with yellow centers. Blooms May to August. 8" minimum root depth.

Comments: Restricted (secondary) noxious weed in Illinois**.** This species is considered invasive by many authorities. Blooms spring to fall. Relatively aggressive species useful for groundcover or beautification. This species is still specified in some Illinois seeding work. Always substitute *Chrysanthemum maximum*. 200,000 to 400,000 seeds per pound.

Chrysanthemum maximum SHASTA DAISY
Habitat: Partial shade tolerant. Tolerant of most soil textures. Neutral soils, tolerant of acid and base.
Culture: Alone, plant 2 oz. per 1,000 sq. ft. (Stock).
Description: Perennial, 1-3', white flower with yellow disk, similar to Oxeye daisy, but taller with each flower head up to 4" across. Blooming June to July. Excellent cut flower. Ground cover. Will colonize? 300,000 to 436,000 seeds per pound.

CHRYSOPSIS (Nuttall) Elliott 1823 **Golden-Aster, Camphorweed** New Latin, from *chrys-* and *-opsis*. North American chiefly perennial woolly, hairy, or glutinous herbs having large often-corymbose heads. Some authors place our plants on *Heterotheca* Cassini 1817.

Chrysopis camporum Greene [*Heterotheca camporum* (Greene) Shinners] GOLDEN ASTER, aka Lemon-yellow False Golden Aster, Prairie Golden Aster. (*camporum* relating to or smelling like camphor, a tough gumlike crystalline from the wood and bark of the camphor tree and used chiefly as a carminative and stimulant in medicine. Or, also simply meaning growing in meadows, of plains, of fields or plains, from Latin *campus, campi*, n. of any open, level land, without reference to cultivation or use, an even flat place; cf. Doric Greek *kapos, kêpos*, a garden, orchard or plantation.)
Habitat: Sand prairies and disturbed sands.
Culture: Cold moist stratify (90) Code B (Cullina 2000). 60 days cold moist stratification (pm 09).
Description: Yellow flowers.
Comments: Blooms 6-9. Seed matures mid-summer to fall (3-5 weeks after flowering, but plants may have blooms and seeds at the same time). This species may be expanding its range eastward with an adventive "weedy" race. Host species of *Orobranche fasciculata*. 481,600 to 1,120,000 seeds per pound

Chrysopsis villosa (Pursh) Nuttall HAIRY GOLDEN ASTER (*villosus -a -um* Latin for with hairs, villous, soft-hairy, softly hairy, from *villōsus -a -um*, shaggy, hairy, rough, from *villus.*)
Description/comments: 60 days cold moist stratification (pm 09). Sow in spring, germination improved by 30 days cold moist stratification (pots 2000). 1,120,000 seeds per pound.

CIRSIUM P. Miller 1754 **Thistle, True Thistle** *Cirsium* New Latin, from Greek *kirsion*, a kind of thistle, probably from *kirsos,* a swollen vein or welt, from the use of thistles in antiquity in the treatment of swollen veins. Widely distributed north temperate genus of about 250 species of prickly herbs having the bristles of the pappus plumose. Flowers provide nectar for Acadian Hairstreak, *Satyrium acadica.*

Cirsium altissimum (Linnaeus) Spreng. TALL THISTLE, aka Roadside Thistle, Wood Thistle (*altissimus -a -um* highest, very high, very tall, tallest, from *altus*, high; deep or profound, plus *-issimus*, the superlative suffix; most so, to the greatest degree, such as largest, prettiest.)
Habitat: Woodland edges, often at the base of bluffs in mesic wooded areas not prone to drying out. Pastures, woodlands, thickets.
Description: Biennial or short-lived monocarpic perennial. Pink to white flowers, 3-5 feet with mostly entire leaves, wooly white beneath, Blooms August-September, 2n = 18.
Comments: Seeds ripen 9-10. 89,231 seeds per pound. Some taxonomists feel this and the next species represent a continuum within a single species.

Cirsium discolor (Muhlenberg ex Willdenow) Sprengel FIELD THISTLE, aka *chardon discolore*, Pasture Thistle, Prairie Thistle. (*discolor* of two colors or of different colors, of different coloring, often referring to the leaves that are green above and grey-white below.)
Habitat: Dry to mesic prairies, open woods, disturbed areas, and old fields.
Culture: Easy by seedling transplant. Further germination pretreatments not sure? (pm 09). Root cuttings will probably work.
Description: 2n = 20, 21, 22.
Comments: Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera, Coleoptera, seed fluff used in nests. 64,000 to 111,193 seeds per pound. Sørenson believes this and the previous species represent a continuum. Hybrids, some fertile, are known, *C.* x *iowense*.

CONOCLINUM DC. **Mistflower** See *Eupatorium* in part. A genus of 4 species of eastern and central North America into Mexico.

COREOPSIS Linnaeus 1753 **Coreopsis, Tickseed** *Coreopsis* like a bug, New Latin, from Greek *koris, korios*, a bug, tick, or bedbug, and Greek -οψις, *opsis*, an appearance, a seeing, indicating a resemblance, akin to Greek *keirin*, to cut; for the resemblance of the seeds (cypselae) of the first described species to ticks. About 50 species of herbs, of America, many in cultivation, which have showy flower heads with involucral bracts in two distinct series of eight each, the outer being commonly connate at the base. Fruits are achenes, attracts songbirds. Closely related to *Bidens*.

Seeds mature summer to fall. Perennial species germinate better after cold moist treatment. Spring softwood cuttings root easily. You may also use root cuttings in spring before new growth commences. Code A or B. (Cullina 2000)

Coreopsis lanceolata Linnaeus SAND or LANCE-LEAVED COREOPSIS, Lanceleaf Tickseed, Long-stalk Coreopsis, Long-stalk Tickseed, Sand Tickseed, Tickseed Coreopsis New Latin from *lancea,* lance or spear, *-ola-, -olus-,* diminutive, and *-atus*, possessive of or likeness of, for the lanceolate leaves.)
Habitat: Native stands are found in dry, sterile areas, such as dry, hill and sand prairies. Low to moderate water requirement. Prefers sandy or rocky soils. Establishes easily on disturbed soils. Tolerate range of soil types. Common in east 1/2 of USA and in prairies. Tolerant of moderately coarse to moderately fine soils, but longer-lived on well-drained soils. Anaerobic tolerance none. CaCO3 tolerance none. Drought tolerance low (?USDA). Fertility requirement medium. Salinity tolerance none. Shade intolerant, full sun to partial shade. pH 6.0-7.0.
Culture: 30 days cold moist stratification (pm 09). "10 days moist stratification improves germination in greenhouse, but not necessary for good crop. Field sow fall, spring, early summer." (pn nd) Sow seeds out doors anytime. 10 pls lbs/ acre 1/8 to 1/4" (do not bury, needs light to germinate) in spring or fall. Usually flowers second year in seedings. Seeded alone plant 4 oz. per 1,000 ft. sq. (stocks). Pure stand plant 10 lb per acre (granite). Pure stand broadcast or shallowly drill 5-7 grams per 100 sq ft, or 5-7 lbs per acre (usda). Growth rate moderate. Seedling vigor high. Vegetative spread rate none.
Description: Native, short-lived, clump-forming perennial. 1.5-3', with solitary or in small groups, 1-2" daisy-like flowers, with yellow rays and disk, on long, slender stems. 8-rayed flowers with 4 lobes at tip of each ray. Drought tolerant. Leaves hairy or not, basal divided, upper entire, oval -shaped. 6" minimum root depth.
Comments: Blooms 4-7. May occasionally flower first year. Excellent cut flowers, attractive dried seed heads, landscaping. Often used for immediate impact in prairie restorations, recommended for roadside plantings, wildflower mixes and stabilizing disturbed areas. Attracts butterflies, songbirds (little food value? debated). Aggressive early, short-lived except on sandy soil 155,028 to 320,000 seeds per pound.

Coreopsis palmata Nuttall *MI. PRAIRIE COREOPSIS, aka Finger Tickseed, Prairie Tickseed, Stiff Tickseed (*palmatus -a -um* palmate, lobed or divided like a hand with fingers.)
Habitat: Mesic, dry, hill, and sand prairies, mesic prairies, open woods.
Culture: "Cold moist treatment, or fall sow. Light cover. Good germination." (Dunham 1993) 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant, light, easy from dry stratified seed. Division of mature clumps, stem cuttings, root cutings.
Description: Yellow flowers, 1.5-2.0' 2n = 26.
Comments: Blooms 6-8. Cut flowers, attractive dried seed heads, landscaping. Aggressively rhizomatous, allelopathic. 157,913 to 230,457 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera.

Coreopsis tripteris Linnaeus *MD TALL COREOPSIS, aka Tall Tickseed (*tripteris* three-winged, New Latin possibly from Latin *tri*, three, and Greek *pterid-, pteris* fern, akin to Greek *pteron, pteryx*, feather, wing.)
Habitat: Mesic prairies to wet prairies, mesic and dry savanna. Oldfields, woodland edges, and thickets. Calcareous soils. Tolerant of 1" inundation for short periods. Nutrient load tolerance low, Salt tolerance not available. Siltation tolerance low. Partial to full sun. pH data not available.
Culture: "Cold moist treatment, or fall sow. Light cover. Good germination." (Dunham 1993). 60 days cold moist stratification (pm 09). 30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer. (pn nd) Genesis seed test data indicates many lots do not require cold moist stratification. Cold moist stratify or fall plant, seeds need light, use shallow soil cover, easy from dry stratified seed, division of mature clumps. Due to potential aggressiveness, use conservative seeding rates, 0.015 - 0.031 pls lb per acre. This species is not suitable for small plantings.

Seed, transplants, and plugs readily available. Establishes easily from seed and self-sows.
Description: Perennial herb, 4.0-8.0', yellow flowers.

Comments: Blooms July to October. In some cases can be very aggressive in plantings, aggressively self-sows. It can be invasive on mesic and dry soils. In the Center Prairie restoration, it dominates about one-half acre after 30 of growth. Interesting *Cannabis*-like foliage. 204,091 to 305,930 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, Hymenoptera, Diptera, Lepidoptera, and Coleoptera. Blooms attract butterflies. Good nectar source? Said to be an important source of pollen, blooming when few other species are in bloom.

COSMOS Cavanilles 1791 **Cosmos** plural **Cosmos, Cosmoses** *Cosmos* beautiful, New Latin from German *kosmos,* from Greek, *kosmos*, beautiful, ornament; order, a harmoniously ordered universe. Tropical American herbs, ca. 26 species, having opposite leaves, flowers solitary in loose corymbose panicles, and flower heads with prominent rays. Most cultivated varieties are popular fall-blooming annuals, derived from a Mexican species, *C. bipinnatus.*

Cosmos bipinnatus Cavanilles COSMOS, aka Common Cosmos, Common Garden Cosmos, Garden Cosmos (*bipinnatus -a -um* twice-pinnate, double pinnate, or feathered, from Latin *bi, bis,* twice, and *pinnatus*, feathered, winged, with bipinnate leaves.)
Habitat: Does well on infertile, sandy soils. Adaptable, grows in most soils textures, low water requirements. Best in neutral soils, some acid and base tolerance. Full sun. Introduced from Mexico.
Culture: Easy to establish, quick growing. Pure stand plant 15 lb per acre (granite).
Description: Introduced annual, rarely escaped, 30-60", with showy pink, white, and crimson flowers on tall stalks from summer to fall.
Comments: This is considered invasive in the se United States. Blooms August to October. Recommended for roadsides, fence lines, exposed slopes, hedgerows, background areas. Attracts butterflies. 60,000 to 80,800 seeds per pound.

Cosmos sulphureus Cavanilles YELLOW COSMOS, aka Orange Cosmos, Sulphur Cosmos (*sulphureus -a -um* sulfur-colored, sulphur yellow, generally for the sulphur yellow flowers.)
Habitat: Drought tolerant, full sun. Easily established on most sites, but prefers coarse soils. Grows in most soils textures, low water requirements. Used in roadside plantings, exposed slopes, background landscaping. From Mexico or tropical America.
Culture: Pure stand plant 15 lb per acre (granite).
Description: Introduced annual, 24-36", with sulfur orange, yellow, or red flowers on tall branching stems.
Comments: This species is considered invasive in the se United States. Blooms flowers from summer through fall. 45,560 to 61,000 seeds per pound.

DOELLINGERIA Nees 1832 **Flat-topped Aster** see *Aster umbellatus*

Doellingeria for Ignatz *Doellinger,* 1770–1841, German botanist. A genus of 7 species of herbs of eastern North America and eastern Asia. It has been treated as a genus separate from Aster or as a subgenus of Aster. Nesom (1993) notes *Doellingeria*'s affinities are closer to *Solidago* and its relatives than to *Aster,* which is supported by molecular evidence.

ECHINACEA Moench 1794 (formerly *Brauneria,* and at one time included in *Rudbeckia*) **Purple Coneflower** *Echinacea* New Latin, from *echin-* and *-acea* (feminine of *-aceus*) from Greek *echinos* hedgehog, or Latin, *echinus*, sea urchin, for the spiny receptacle scales. Coarse herbs having thick rough leaves and long-stalked flower heads with showy purplish, crimson, or yellow rays. A genus of four to nine species endemic to eastern and central USA (or 4 species, 10 taxa). All Echinacea are self-sterile. Long-lasting showy flowers. Said to be aggressive by some. Many species are harvested for medicinal use. x = 11.

This genus is notoriously promiscuous in the nursery. For better or worse, flower breeders have lately produced many colorful selections.

Echinacea pallida and *purpurea* easy from moist stratified seed. "Cold moist treatment, or fall sow. Very light cover. Good to fair germination." (Dunham 1993). Seeds mature late summer to early fall. The narrow-leaved species are slower from seed and require well-drained potting soil. Code B. (Cullina 2000)

Echinacea pallida (Nuttall) Nuttall *TN, WI PALE PURPLE CONFLOWER, aka Purple Coneflower, Pale Coneflower (*pallidus -a -um* pale, pallid, somewhat pallid, from *pallere* to be pale, from Greek *polios* gray.)
Habitat: Dry, hill, and sand prairies, mesic prairies, open woods, open prairies, grassy slopes, full sun or light shade. Tolerates some shade. Low moisture requirements. Neutral soils, some acid tolerance. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance low. Shade intolerant. pH 6.5-7.2.
Culture: 90 days cold moist stratification. Best planted outdoors in the fall. (pm 09) "60 days moist stratification required for germination. Field sow fall." (pn nd) Fall plant gives our best germination, or cold moist stratify 90 days

@ 35-40º F., successional restoration. For single species stand, plant 4.5 oz. per 1,000 ft. sq. (stocks) Pure stand plant 12 lb per acre. (granite) For seed production, plant 3-5 pls pounds per acre in 36" rows. For a solid stand, plant 15-20 pls pounds per acre (usda). In seed mixes use 0.125 to 0.5 pounds per acre. This species may also be winter broadcast in thin sods or no-till drilled into burned old fields and remnants, with spectacular results in 5 years. Our experience indicates dry stored seed summer planted may over-winter to grow the following year. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description: Attractive native perennial, 18-36", with long lavender-pink ray incurving petals drooping around dark domed disc, long-lived perennial in well-drained soils, 1.5-3.0' 2-3'. Rough hairy long narrow leaves, 5 to 20 times as long as wide. 14" minimum root depth. 2n = 22.
Comments: Blooms 6-7. The long stem makes good cut and attractive dried seed heads. Useful in roadside plantings, prairie restoration and landscaping, and wildlife food and cover. Medicinal uses, one of the sources of *Echinacea* extracts. Flowers pollinated by bumblebees and beetles. Attracts butterflies, hummingbirds, upland gamebirds, & songbirds. Drought tolerant. Can be short lived on rich soils 77,587 to 161,074 seeds per pound.

Echinacea purpurea (Linnaeus) Moench *FL, IA?, OH Still referred to as *Rudbeckia purpurea* in some seed catalogs. PURPLE CONEFLOWER, aka Black Susans, Broad-Leaf Purple Coneflower, Comb Flower, Echinacea, Eastern Purple Coneflower, Hedge Hog, Indian Head, Kansas Snakeroot, Scurvy Root, Snakeroot (*purpureus -a -um* purple, from Latin *purpureus*, adjective, purple colored, dark red, dark brown, clad in purple, gleaming, bright, beautiful, for the purple flowers)
Habitat: Bur oak savanna, full sun or light shade. Prefers open prairies or woodlands, but establishes on a wide variety of soils. A savannah species, but said to prefer full sun. Low to moderate moisture requirements. Moderately coarse to moderately fine soils. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance low. Fertility requirement low. Salinity tolerance low. Shade intolerant? pH 6.5-7.2, neutral soils. distribution: In northwest Illinois it is native as far north as Kewanee and Sparland. Also known from Victoria and Wady Petra.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Fall plant or cold moist stratify 60-90 days is indicated by some authors, but several lots of local ecotype, over a period of years are totally nondormant and germinate well without pretreatment. "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Cuttings or division in spring. For single species stand, plant 4.8 oz. per 1,000 sq. ft. Pure stand plant 12 lb per acre (granite) Plant anytime in El Paso (pots 2000). Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.
Description: Native upright perennial, 24-36", with single lavender-purple flowers with spiny golden-purple disk on long stems, fairly drought tolerant. 24" minimum root depth. 2n = 22.
Comments: Blooms 6-8. Good cut flowers if cut before flowers are "blown", or while slightly immature. Attractive dried seed heads. Landscaping, commonly used in restoration seedings for quick color and erosion control. Common element in wildflower and roadside mixes, good background plant. The tops and roots of this species have medicinal uses, and it is widely cultivated for such. 96,000 to 123,874 seeds per pound.
Associates: Pollinated by bumblebees and beetles. Attracts butterflies and hummingbirds.

ERIGERON Linnaeus 1753 Fleabane, Daisy Fleabane, *érigéron, vergerette* *Erigeron* New Latin, from Latin, groundsel, from Greek *erigeron* from *eri* early, or *erio*, woolly and *geron* old man. The accrescent, gray or white fluffy pappus is like the hair of an old man, or for the solitary, woolly heads of some species. Widely distributed genus of about 390 species of herbs having flower heads resembling asters but with fewer and narrower involucral bracts. The leaves and tops of plants were formerly used as a diuretic and as a haemostatic in uterine hemorrhage. A volatile oil is sometimes distilled from *Erigeron canadense* for medicinal use. x = 9. Seed of desirable species is not well represented in the trade.

Erigeron pulchellus Michaux ROBIN'S PLANTAIN, aka Hairy Fleabane, *Vergerette délicate* (*pulchellus* pretty, beautiful; beautiful but small, little beautiful.)
Habitat: Moist woods and stream banks. Rhizomatous.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09) Code C (Ken Schaal).
Description/comments: Perennial, white or pink to bluish flowers. 1,600,000 seeds per pound.

EUPATORIUM Linnaeus 1753 **Eupatorium, Boneset, Joe Pye Weed, Thoroughwort, Dog-fennel** *Eupatorium* New Latin, from Greek *eupatorion* (*E. cannabinum*) hemp agrimony, said to be from *eu* good, and *pator* father, from Mithridates VI Eupator, 132-63 B.C. King of Pontus, who, ca. 115 B.C. is said to have discovered a species was an antidote to a common poison. Mithridates was said to be immune to many poisons through repeated experimentation upon himself to find their antidotes. (mithradate is an old term for medical restoring agency or an antidote to a poison, which see.) A large genus of chiefly tropical herbs having heads of white or purplish flowers arranged in cymose clusters, a capillary pappus, and 5-angled achenes. The size of the genus is variable with several species sometimes

placed in the genera *Ageratina* Spach, *Conoclinium* DC., or *Eutrochium* Rafinesque (nee *Eupatoriadelphus* King & H.E. Robins), or elsewhere! Synonym lists and some variety names reflect impending changes. x = 10. (*Ageratina* x = 17. *Eutrochium* x = 10.)

Seeds mature in fall approximately one month after flowering. Most species are easy from seed, with moist stratified seed bringing quicker more uniform germination. Code B. Two-node tip cuttings root well. (Cullina 2000)

Eupatorium altissimum Linnaeus TALL BONESET, aka Tall Joe Pye Weed, Tall Thoroughwort (*altissimus -a -um* highest, very high, very tall, tallest, superlative of *altus*, and *–issimus*, superlative suffix; most so, to the greatest degree; most-, -est, such as largest, prettiest, whitest. This is not the tallest *Eupatorium*, and certainly not the most noble.)
Habitat: Mesic and dry prairies, mesic savanna. Often on limestone soils, but aggressive in mesic, dry, and sandy soils.
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant-light. Slowly, inexorably, persistently self sows.
Description: White flowers 3.0-5.0'. 2n = 20, 30, 40. The similar, but usually smaller *Brickellia eupatorioides* has 10-ribbed cypselae and plumose pappus bristles.
Comments: This plant is considered invasive in some habitats or in parts of its range. Blooms 8-10. Cut flowers. Aggressive, self sows. Not suited for small plantings. Some populations are apomictic polypoids. 800,000 to 914,401 seeds per pound.
"A tall hoary plant with numerous sessile leaves that is common on roadsides, prairies, and hills. It is later flowering than *E. rugosum*." (Fell 1955)

Eupatorium fistulosum Barret *ME, MI, NH [new nomenclature *Eutrochium fistulosum* (Barratt) E.E. Lamont] HOLLOW JOE PYE WEED, Hollow-Stemmed Joe Pye Weed, Trumpetweed, Tubular Thoroughwort (*fistulosus -a -um fistulosa*, tubular, dude!, hollow, pipe-like, but closed at both ends, hollow throughout as the leaf of an onion, New Latin from *fistula*, a water-pipe; a reed-pipe, shepherd's pipe, tube, hollow reed or stalk, or Pan pipe, and *-osus* plenitude or notable development.)
Habitat: Moist thickets, floodplains, wet meadows. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 4.5-7.0.
Description: To 6'+. Stem is strongly glaucous and hollow with a large central cavity, leaves 6-7 per node. 2n = 20.
Comments: This plant is considered invasive in some regions and habitats (Haragan, P.D. 1991). Blooms July to September. 1,210,667 to 1,440,000 seeds per pound. Formerly and briefly known as *Eupatoriadelphus fistulosus* (Barratt) King & H.E. Robins.

Eupatorium maculatum Linnaeus *KY, MD [new nomenclature *Eutrochium maculatum* (Linnaeus) E. E. Lamont, but also seen as *Eupatoriadelphus maculatus* (Linnaeus) King & H.E. Robins.] SPOTTED JOE PYE WEED, aka *eupatoire maculée*, Spotted Boneset, Spotted Trumpetweed (*maculatus -a -um* spotted, stained, blotched, blotchy, mottled, New Latin from *macula,* a spot , mark, stain; sometimes the mesh of a net; a moral stain, blemish; or from *maculo*, to spot, stain, pollute, defile, for the spotted leaves and stem.)
Habitat: Wet meadows, calcareous fens. Floodplains and thickets. Prefers moist soils. Tolerates inundation up to 6" early in season in natural habitats such as wet meadows, open marshes, and fens. Tolerant of flooding for short periods in spring. Nutrient load tolerances low. Siltation tolerance not available. Anaerobic tolerance medium. CaCO3 tolerance high. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 5.5-7.0. distribution *E. maculatum* is the widest ranging geographically and the most morphologically variable species in the genus (*Eutrochium*) (fna).
Culture: Easy from seed, but germination can be spotty. Seed is very small and needs light to germinate, sow on top of ground. Cold moist treatment, or fall sow. "May be cold moist treated. Light cover. Very good germination." (Dunham 1993). No pre-treatment necessary other than cold, dry stratification, or 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) "30 days moist stratification required for germination. Field sow fall." (pn nd). Division of clumps in spring every 2-4 years. Stem cuttings are easily rooted. Seeds, plugs and bare root material readily available. USDA (1997) recommends 0.06-2.0 pls lb per acre (but why?). Growth rate rapid. Seedling vigor low. Vegetative spread rate slow.
Description: Perennial herb 4.0-6.0' Light pink to deep rose flowers. Stems usually speckled with purple. 16" minimum root depth. 2n = 20.
Comments: Blooms 6-9. Cut flowers, ethnobotanical uses, wetland restoration. Said to be aggressive. 1,250,000 to 2,000,0000 seeds per pound.
"Less common than *E. purpureum*, which it resembles, and more likely to be in open places. In many wet places in Coon Creek bottom. The low prairies on the two branches of Kent Creek and elsewhere." (Fell 1955)
Associates: Attracts butterflies, bumblebees, and other insects. Provides cover for small mammals, amphibians, and reptiles. Seeds are eaten by swamp sparrows. Swamp sparrows are eaten by marsh hawks.

Eupatorium perfoliatum Linnaeus COMMON BONESET, Agueweed, Boneset, *eupatoire perfoliée*, Thoroughwort (*perfoliatus -a -um* perfoliate, with the leaves joined around stem, as though the stem were growing through the leaves,

or with a leaf-like appendage through which the stalk passes, from Latin *per-*, a prefix, through, extra, very, and *foliatus*, adjective, provided with or having leaves.)
Habitat: Wet meadows, marshes, upland swamps, low woods or thickets, swales, wet shores. Floodplains, bogs, and wet ditches. Usually common. Prefers wet soil. Early in season tolerates inundation to 6" in natural areas such as wet meadows, edges of marshes, fens, and prairie swales. Nutrient load tolerance low to moderate. Salt tolerance data not available. Siltation tolerance low to moderate. Full sun. pH data not available
Culture: "Cold moist treatment, or fall sow. Very light cover. Very good germination." (Dunham 1993) No pre-treatment necessary other than cold, dry stratification, or 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). "30 days moist stratification required for germination. Field sow fall." (pn nd) Genesis seed tests indicate most lots require cold moist treatment. Best from seed, no pretreatments needed, small seeds need light, sow on soil surface. Division of clumps on fall or spring. Stem cuttings root easily

In mixes plant up to 0.125 pls lb per acre (USDA 1997). With debearded seed, 1/4 oz to 1/2 oz is more than adequate.
Description: Perennial herb, 3.0-4.0', white flowers. 2n = 20.
Comments: Blooms August to October. Ethnobotanical uses. Landscaping, used in wetland restoration in upper shoreline zone, and in vegetated swales. Fibrous root system good for erosion control. 2,560,000 to 4,344,498 seeds per pound. "Common in wet places, sloughs, marshes, etc., throughout." (Fell 1955)
Associates: Seeds are eaten by waterfowl, turkeys, and swamp sparrow. Mallards and grouse eat leaves. Attracts butterflies. Provides cover for small mammals, reptiles, and amphibians.

Eupatorium purpureum Linnaeus [new nomenclature *Eutrochium purpureum* (Linnaeus) E. E. Lamont] PURPLE JOE PYE WEED, aka Joe-Pye-Weed, Green-stemmed Joe-Pye-weed, Purple-node Joe-pye-weed, Sweetscented or Sweet Joepyeweed (*purpureus -a -um* purple, from Latin *purpureus*, adjective, purple colored, dark red, dark brown, clad in purple, gleaming, bright, beautiful, for the purple flowers)
Habitat: Wet savannas, mesic woodlands, and thickets. Tolerates partial shade.
Culture: "Cold moist treatment, or no pretreatment, or fall sow. Light cover. Very good germination." (Dunham 1993) No pre-treatment necessary other than cold, dry stratification, or 60 days cold moist stratification. Seeds germinate most successfully in cool soil. (pm 09) "30 days moist stratification required for germination. Field sow fall." (pn nd) Cold moist stratify or fall plant, seeds need light.
Description: Purplish or pink flowers. 3.0-5.0' Stems usually dark purple at the nodes, usually solid, rarely ± hollow at the base.
Comments: Blooms 7-9. Ethnobotanical uses. Landscaping, woodland restoration. Good nectar source. The bruised stems have a pleasing vanilla-like odor. 672,000 to 869,732 seeds per pound.

"Not uncommon, usually being in woods as in Ingersoll Park west of Rockford. The heads are narrower and the flowers lighter in color than *E. maculatum*." (Fell 1955)

Eupatorium rugosum Houttuyn ☠ [new nomenclature *Ageratina altissima* (L.) King & H.E. Robins. var. *altissima*] WHITE SNAKEROOT, Common White Snakeroot, Common Milk-poison, *eupatoire rugueuse*, Richweed, Snakeroot (*rugosus -a -um* rugose, wrinkled, rough; covered with wrinkles, or thrown into wrinkles, from Latin *rugosus*, full of wrinkles, folds, or creases, from *ruga*, wrinkle, for the wrinkled leaves.)
Habitat: Most woodlands, including floodplains and other disturbed woodlands. Moist calcareous shaded places, Rocky woods,
Culture: "Excellent germination. Cold moist treatment, or fall sow. Light cover." (Dunham 1993) 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Comments: This species is considered invasive in parts of its range. Blooms 7-10. This species causes milk sickness, containing a toxin that is transmissible to humans through cow milk. Calcareous, weedy. 2,400,000 to 3,721,311 seeds per pound. "Common and variable, growing in woods, thickest, fence-rows, yards, etc." (Fell 1955)

Eupatorium serotinum Michaux LATE BONESET, aka Late Eupatorium, Late-flowering Thoroughwort (*serotinus -a -um* late, late in the year, autumnal, blooming in autumn, late flowering or late ripening, from Latin *serum*, late.)
Habitat: Mesic prairies, open woods and clearings.
Culture: Easy by seed, self sows. 60 days cold moist stratification (pm 09).
Description: Perennial, 2n = 20.
Comments: Blooms 8-10. 968,000 seeds per pound. "A tall stiff plant that grows in the same places and flowers about the same time as *E. altissimus*." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, and Hemiptera. Attracts upland gamebirds, songbirds, and butterflies.

Eupatorium sessilifolium Linnaeus *MI, MN, NH, VT, WI UPLAND BONESET, aka Sessile-leaf Eupatorium, Woodland Boneset (*sessilifolius -a -um* sessile-leaved.)
Habitat: Mesic woodlands.
Culture: Cold moist stratify or fall plant, seeds need light, use shallow soil cover.
Description: general form Erect perennial with a single stem culms 2.0-2.5', plants glabrous below the inflorescence leaves opposite, distal sometimes alternate, blades pinnately nerved, margins serrate, dotted with glands, base rounded, mostly stalkless but not clasping flowers heads with mostly 5 white flowers, inflorescence small branched, widely spaced corymb N 2n = 20, 30. key features heads with mostly five flower heads, leaves toothed, bases rounded, mostly stalkless but not clasping.
Comments: Blooms 7-9. 1,512,000 seeds per pound.

EUTHAMIA Nuttall ex Cassini [or (Nuttall) Cassini] **Goldentop, Flat-topped Goldenrod** see *Solidago* in part. *Euthamia* New Latin, from *eu-,* good, well, and *thama, tham-* probably from Greek *thamees* crowded, and *-ia*; akin to Greek *tithenai* to place, set, for the crowded branching pattern of the inflorescence. A genus of about 8-10 species of herbs of North America, the knowledge of which is not without some serious problems (Weakley 2008). x = 9.

EUTROCHIUM Rafinesque 1838 **Joe Pye Weed** see *Eupatorium* in part. *Eutrochium* from Greek *eu-*, well, truly, and *trocho-*, wheel-like, alluding to whorled leaves, the verticillate *Eupatoriums.* The genus formerly known as *Eupatoriadelphus*.

GAILLARDIA Fougeroux 1786 **Blanketflower, Gaillardia, Fire-wheels** *Gaillardia* New Latin, from M. Gaillard de Marentonneau (Merentonneau or Charentonneau in some sources), 18th century French magistrate and botanist (or botanical patron) and New Latin *–ia*. About 15-30 (15-17+) species of temperate North American and South American annuals, perennials, and subshrubs, having hairy foliage and long stalked flower heads with showy yellow, purple, or variegated rays. x = 19.

Seeds mature summer. No seed treatment is necessary. Code A. The perennial species may be divided in spring. (Cullina 2000)

Gaillardia aristata Pursh BLANKET FLOWER, aka Common Blanket-flower, Common Gaillardia, Firewheel (*aristata -a -um* aristate, awned, bearded, a long bristle like tip, with awns like the ear of barley or wheat, from Latin *arista*, noun, the beard of an ear of grain; ear of grain, and *–atus*, possessive of or likeness of something.)
Habitat: Full sun to partial shade. Tolerates partial shade. Does well on any well-drained soil. Low moisture requirement. Coarse to moderately fine textured soils. Neutral to basic soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance low. Shade intolerant, full sun. pH 5.5-7.9.
Culture: Broadcast 1/8 to 1/4" deep 10 pls lbs per acre. Stocks recommends when planted alone 4 oz. per 1,000 ft. sq. Pure stand plant 10 lb per acre (granite). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Remove spent blooms to prolong flowering.
Description: Western native short-lived perennial subshrub, 12-24", with large red scarlet, bronze, and yellow (red and yellow) petaled daisy-like flowers with "domed" red centers, hairy stems and dandelion-like leaves, 16' minimum root depth. 2n = 34, 68.
Comments: Blooms 6-9. Fairly drought tolerant, used in erosion control or "annual" mixes. Sometimes flowers the first year from seed. Good cut flower. 130,368 to 186,436 seeds per pound.

Gaillardia pulchella Fougeroux INDIAN BLANKET, Annual Gaillardia, Firewheel (*pulchellus -a -um* pretty, beautiful; beautiful but small, little beautiful.)
Habitat: Full sunlight. Native to sandy plains and roadsides in deserts. Adapted to a wide range of soils. Coarse to moderately fine soils. Neutral to basic soils. Sun loving, adapted to many soil types. Anaerobic tolerance none. CaCO3 tolerance high. Drought tolerance high. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 7.0-8.5.
Culture: Does well from seed. As an annual, it blooms first year from seed. In single species plot plant 4 oz. per 1,000 ft. sq. (stocks). Pure stand plant 10 lb per acre (granite). Sow in the spring in the north and in the fall in the South. Growth rate rapid. Seedling vigor high. Vegetative spread rate none.
Description: Western native annual subshrub (?), 18-24", very showy red daisy-like flowers with yellow margins, 12"minimum root depth. 2n = 34.
Comments: Blooms 5-9. Can be annual, biennial, or perennial. Recommended in "annual" mixes or mass plantings. Said to be salt tolerant enough to plant on coastal properties in Virginia. One variety is native to coastal dunes from North Carolina to Florida. 132,000 to 298,340 seeds per pound.

GNAPHALIUM Linnaeus 1753 **Cudweed, Everlasting, Rabbit Tobacco** *Gnaphalium* floccose-woolly, New Latin, alteration of Latin *gnaphalion* cudweed, modification of Greek *gnaphallion*, a downy plant, an ancient name applied to these and similar plants, from *gnaphallon*, lock of wool, from *gnaptein* to card, alteration of *knaptein*. Hoary or woolly-tomentose widely distributed herbs having whitish persistent involucres.

Gnaphalium obtusifolium Linnaeus OLD-FIELD BALSAM, aka Cat's-foot, Eastern Rabbit-tobacco, Fragrant Cudweed, *gnaphale à feuilles obtuses*, Old-field Cudweed, Mouse-Ear Everlasting, Rabbit-tobacco. (*obtusifolius -a -um* obtuse-leaved, with leaves blunt at the apex, from Latin *obtus*-, dull or blunt, and *-folium*, leaf, for the rounded leaf tips.)
Habitat: Sterile, often sandy fields, pastures, disturbed or successional sites.
Culture: Cold moist stratify 60 days (Wade). Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09).
Description: general form Erect annual (or winter annual), aromatic forb culms 4-32", stems white woolly or arachnoid with matted white hairs leaves alternate, toothless, mostly sessile, linear, bases not decurrent or adnate-auriculate, whitish below and greenish above flowers white, no ray flowers, disks with 75-125 flowers; inflorescence with many heads in branched, often roundish corymbiform clusters, fruit smooth dry achene on fluffy pappus key features aromatic, stems white woolly, inflorescence often a roundish cluster (corymbiform), leaf bases not extending down the stem, leaves greenish above.
Comments: Blooms 7-10. 8,000,000 to 17,803,921 seeds per pound.

HASTEOLA Rafinesque 1838 **Sweet Indian Plantain** A genus of 2 species of herbaceous perennials of eastern North America. Also known as *Synosma*. x = 20. See *Cacalia* in part.

HELENIUM Linnaeus 1753 *Helenium* from Greek name for another plant named after Helen of Troy, from whose fallen tears these flowers are said to have sprung. Alternately New Latin, from Latin, a plant, elecampane, from Greek *helenion*, perhaps from *helene* wicker basket; torch, destroyer. A genus of about 32-40 species of herbs of North America, Mexico, Cuba, Central America, and South America, with heads of yellow-rayed flowers and truncate-style branches. Seed is an achene (or is it?) x = 17.

Helenium autumnale Linnaeus SNEEZEWEED aka Autumn Sneezeweed, Bitterweed, Common Sneezeweed, False Sunflower, *hélénie automnale*, Helenium, Sneeze-wort. (*autumnale* from Latin *auctumnalis*, of or pertaining to autumn, for its blooming period)
Habitat: Shores, meadows, and low thickets wet meadows, upland swamp, sedge meadows, lowland woods, shores, and calcareous fens. Prefers moist to saturated soils. Tolerant of brief shallow inundation typical of natural areas, such as wet prairies, sedge meadows, and fens. Nutrient load tolerance moderate to high, salt tolerance data not available, siltation tolerance moderate to high. Full sun to partial shade. Anaerobic tolerance low. CaCO3 tolerance high. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade intolerant. pH 4.0-7.5. or 6.0-7.0.
Culture: Easy from seed, usually good germination in 30 days no treatment, readily grown. "No pretreatment needed, or cold moist treatment, or fall sow. Light cover. Very good germination. Self sows." (Dunham 1993). No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. . (pm 09) "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, early spring." (pn nd) Genesis seed test data indicate about one out of five lots will require cold moist stratification.

In mixes sow 0.12-0.5 pls lb per acre (USDA 1997). Our recommendation is up to 0.125 lbs per acre. Growth rate rapid. Seedling vigor high. Vegetative spread rate none.

Can divide mature plants in spring. Cuttings.

Description: Perennial herb. 3-5'. Yellow flowers, 5-merous. 2n = 32, 34, 36.
Comments: This species is considered invasive in some parts of the United States. May be a serious economic weed in pastures in the west. Blooms August to November. Cut flowers, landscaping, wetland restoration, fibrous root system helps provide erosion control in upper shoreline zone, stream bank, and vegetated swales. Aggressive. 1,956,897 to 2,522,222 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, and Hemiptera. Attracts butterflies, upland game birds, songbirds, and small mammals. Small mammals eat roots in winter. May be harmful if ingested by livestock.

HELIANTHUS Linnaeus 1753 **Sunflower** *Helianthus* New Latin, from Greek *helios, heli-,* the sun, and *-anthus*, flower, from the flower heads. A genus of about 50 (52) species of tall erect or sometimes much-branched American annual or perennial herbs comprising the sunflowers and having flower heads with purple or yellow disk flowers and showy yellow sterile rays. Yellow flowers, perennial species are rhizomatous, and can be quite aggressive and weedy. Sunflowers attract upland game birds, songbirds, and small mammals, providing important wildlife food. Some species

are phytotoxic and/or autotoxic. Sunflowers may be a source of some hay fever (ilpin). Plants are generally self-sterile. x = 17.

Seeds are achenes, ripening in fall. Easy from dry stratified seed, Code A (Cullina 2000), but some species or lots will require cold moist stratification (Wade various years). Five to seven node stem cuttings in spring from the top foot are generally successful (Cullina 2000).

They are incredibly beautiful addition to the fall landscape, but are aggressive as hell. *Helianthus* have absolutely no place in *de novo* seedings, unless you're a real dufus. Many species have potential use as a breadstuff, oil, and a coffee substitute (ilpin)

From a letter from Charles C. Deam, while preparing a flora of Indiana, to Paul Weatherwax, a botanist at Indiana University, May, 1937, commenting on classifying *Helianthus* specimens: "If I have another attack of *Helianthus*, I am a dead one. I am not sure I shall survive this one. Last night I came across a nondescript. Say man how I hate them. Doubtless sometimes you wish to call someone a mean name. Well, I have found it. Just call him a sunflower. That combines all that is needed. The brutes have no principles, guided by no laws, and seem to [be] free for all."

Helianthus annuus Linnaeus ANNUAL, COMMON, GARDEN or WILD SUNFLOWER (annual, from Latin *annuus,* adjective, that lasts for a year; returns, or recurs every year.)
Habitat: Open areas, roadsides and agricultural fields. Coarse to moderately fine soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance low. Shade intolerant full sunlight. pH 5.5-7.8.
Culture: Easily established. Pure stand plant 10 lb per acre (granite). Growth rate rapid. Seedling vigor low. Vegetative spread rate none.
Description: Native and/or naturalized, includes weedy, cultivated, and escaped plants (adventive to some, admittedly some strains are) robust annual, 36-120", yellow daisy-like flower with dark centers. N 2n = 34 key features "Pales (chaff of the flower head) without conspicuous apical white hairs; achenes glabrous, 4-8mm broad; leaves rough-hairy, and lower ones usually heart-shaped. Involucral bracts conspicuously long-haired on margin and usually on back." (ilpin)
Comments: Secondary noxious weed in Iowa. State flower of Kansas. This plant is considered invasive by some authorities. Blooms July to August. Multi-stemmed plants in ag fields, roadsides, disturbed areas. Often forming large colonies. Probably moved into Illinois about 7 or 6,000 years ago during the Altithermal. Important Native American pre-maize crop in Midwest. 46,919 to 58,500 seeds per pound.
Associates: Seed is good food for many birds, sought out by doves. Some authorities feel the seeds are of low value. Endomycorrhizal.

Helianthus divaricatus Linnaeus SAVANNA SUNFLOWER from HELL, aka Divergent sunflower, Spreading Sunflower, Woodland Sunflower (*divaricatus* widely divergent, widely spreading apart, spread asunder, straggly, divergent.)
Habitat: Sandy black oak savannas, white oak woodlands. Full sun to partial shade.
Culture: 30 days cold moist stratification (pm 09). (Code C Ken Schaal). Not well represented in the seed trade.
Description: Yellow daisy-like flower, 2-5'. Rhizomatous. 2n = 34. "Stems with a whitish bloom, with or without small, stiff hairs; leaves thick, opposite narrowly lanceolate to triangular ovate; short or no petioles." (ilpin)

"One of the earlier flowering perennial *Helianthus, H. divaricatus* resembles the tetraploid *H. hirsutus* but differs by its usually glabrous and often glaucous stems, sessile or subsessile leaves, and smaller reproductive organs (disc corollas, paleae, cypselae). Plants from the Ozark region of Arkansas have larger leaves and heads and may represent a polyploid form of *H. divaricatus*. Natural hybrids with *H. microcephalus* have been named *H. glaucus* Small (D. M. Smith and A. T. Guard 1958). Hybrids with other species differ from *H. divaricatus* in having short but distinct petioles, hairy stems, leaves with more rounded bases, and primary lateral leaf veins diverging in a subopposite manner distal to bases, rather than being strictly opposite and basal." (fna)
Comments: Blooms July to October, aggressively rhizomatous. 76,800 to 136,000 seeds per pound

Helianthus giganteus Linnaeus *IL GIANT or TALL SUNFLOWER, aka Tuberous Sunflower, Swamp Sunflower (*giganteus* very large, giant, gigantic, unusually high, higher then the type, from Latin *giganteus -a -um*, adjective, of or belonging to giants.)
Habitat: Generally prairie fens, but can also be found in moist calcareous prairies and Tamarack bogs.
30 days cold moist stratification (pm 09).
Description: Rhizomatous. 175,008 seeds per pound.
Comments: Blooms August to September. Provides food for songbirds.

Helianthus grosseserratus M. Martens SUNFLOWER from HELL, aka *hélianthe à grosses dents*, Sawtooth Sunflower (*grosseserratus* large-toothed, from Latin *grossus*, thick, coarse, and *serratus*, saw-like, saw-toothed,

serrated.) The specific epithet is also spelled *grosse-serratus*.
Habitat: Wet meadows, mesic to wet prairies, and degraded prairies. Prefers moist to saturated soils. Tolerant of seasonal inundations typical of natural areas, i.e. wet prairies and sedge meadows. pH data not available, Nutrient load tolerance moderate. Salt tolerance moderate. Siltation tolerance moderate. Full sun. distribution "The original range of this species was apparently centered in OH, IN, IL, IA, and MO, but its exact extent is obscured by its subsequent spread." (Weakley 2008) Hmmmm, a WEED perhaps?
Culture: 30 days cold moist stratification (pm 09). "30 days moist stratification required for germination. Field sow fall." (pn nd) Our (gni) greenhouse experience shows it easily grown with no treatment, rapid growth rate; cold moist stratification may help some seed lots, but why? Fall seeding works well. Seeding rate not available (USDA 1997). Seeding rate not advisable, or < 1 seed per acre (gni).
Easy by division in spring or fall. Stem cuttings in spring root easily
Description: WEED. Showy, kind of nice in the fall but WEED. Aggressive perennial herb, 6-10', 3-13' Yellow to cream flowers, but WEED. 2n = 34.
Comments: Blooms July to October. When is the last time you saw a few Sawtooth Sunflowers? Have you ever seen a few Sawtooth Sunflowers? When is the last time you saw a lot of Sawtooth Sunflowers? Wetland restoration, soil stabilization in upper shoreline zone and vegetated swales. Good pioneer species. Weedy, self-sows, rhizomatous. Spreads rapidly with moisture and may become a pest. 200,000 to 827,586 seeds per pound.
Associates: Provides nectar and pollen for bees, etc. Insects, birds, and small mammals eat seeds. Provides reproductive and foraging habitat for Gorgone checkerspot butterfly.

Helianthus × laetiflorus Persoon (pro sp.) [*pauciflorus* × *tuberosus*] CHEERFUL SUNFLOWER, aka Beautiful Sunflower, *Hélianthe à belles fleurs*, Hybrid Prairie Sunflower, Mountain Sunflower. (*laetiflorus* bright-flowered or pleasing-flowered)
Habitat: Full sun, dry roadsides and disturbed areas. distribution Adventive eastward.
Culture: 30 days cold moist stratification (pm 09).
Description: general form Erect perennial forb roots rhizomatous culms 1.5-8', rough stems usually leafless near the top leaves 2 1/2 to 8 times as long as wide, mostly all opposite, up to 9-15 pairs below the inflorescence, tapering to a 1-5 cm petiole flowers 3-6 heads, 2" - 3 1/2" wide, 10-21 yellow rays, disk often yellow; inflorescence of one to a few heads on long stalks, seeds seldom formed N 2n = 102 key features Disk flowers often yellow, leaves mostly all opposite, with long stalk; very similar to *H. pauciflorus* but with longer leaf stalks and often yellow disks.
Comments: Blooms late summer to fall. 64,000 to 121,781 seeds per pound. "Plants called *Helianthus ×laetiflorus* are usually interpreted to be hybrids and backcrosses of *H. tuberosus* and *H. pauciflorus*; they are widely cultivated and often escape. An alternative treatment has been to use the name *H. laetiflorus* for plants that are treated here as *H. pauciflorus*, sometimes with infraspecific taxa." (fna)

Helianthus maximilianii Schrad. MAXIMILIAN SUNFLOWER, aka *hélianthe de Maximilien*, Narrow Leaved Sunflower, New Mexico Sunflower (Named for Prince Maximillian, a naturalist who led an expedition in the West in the 1830s. The species epithet is also spelled *maximiliani.)*
Habitat: Degraded prairies, largely adventive in our area, where native common on deep or heavy soils. Moderate moisture requirement. Tolerant of most soil textures. Neutral soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 6.0-8.0. distribution Native to mid-continental prairies. Cultivated as an ornamental and adventive over much of North America.
Culture: No pre-treatment necessary other than cold, dry stratification, or 60 days cold moist stratification (pm 09). CMS 56 days. Germination best at 30º C day and 15º C night. Sow any time, cut to the ground in winter (pots 2000). Pure stand plant 10 lb per acre (granite). USDA recommends 1 pound per acre for solid seedings. Plant from early winter through early spring. Best with mechanical weed control. Growth rate rapid. Seedling vigor high. Vegetative spread rate moderate. Where native, use 0.1 to 0.25 pounds per acre in mixes.
Description: general form Native to middle USA, very aggressive erect rhizomatous perennial roots 16" minimum root depth culms 36-60", some varieties to 7-10 feet, stems with fine obvious white hairs especially at the top of the stem leaves lower leaves opposite, upper mainly alternate, rough on both sides, firm, base tapering to short winged stalk, edges usually not toothed flowers disk flowers yellow, perfect, fertile, ray florets sterile, 3" (1.75-4") yellow flowers, with 20-40 (10-25) ray flowers along the stalk like a hollyhock, inflorescence with several heads in tall, narrow clusters N 2n = 34 key features Several stems, disk yellow, inflorescence tall, narrow cluster, leaves upper mainly alternate, rough on both sides, winged stalk. "Diagnostic features include: 1) elongate, tapering bracts; 2) leaves light or gray-green, sessile, longitudinally folded, smoothed-margined, and covered with soft hairs; 3) stems light green to light red." (ilpin)
Comments: Status May be a weed of economic consequence in some areas. Blooms 9-10. C3. Showy, rhizomatous, very competitive in mixes. Tall enough to use as a privacy screen next to that jerk of a neighbor, but allow 3 feet on

each side of the bed, and judiciously control, at least on your side. Good in erosion control seedings. Allelopathic, inhibits nearby plants. 150,000 to 250,000 seeds per pound.

To quote the USDA Plant Fact Sheet, "The plant's long flowering period and spreading habit, along with its tendency to form thickets or large colonies, make it ideal for wildlife food and cover." Just the thing to put in a prairie seed mix, not.

Associates: Flowers attract butterflies, beetles, and long- and short-tongued bees. Larval host for butterflies and moths. Used in permanent wildlife food plots, providing habitat, cover and food. Palatable to livestock, especially sheep and goats, but of low nutritional value. Upland game birds, songbirds and some waterfowl consume the seeds. Small mammals eat young shoots. Elk, mule deer, white-tailed deer, and pronghorn antelope browse and graze older shoots. Look for that ungulate! Though they do not bounce, the stems contain natural rubber, indicating a potential future crop with no gene splicing necessary.

Helianthus mollis Lam. *MI, OH FUZZY SUNFLOWER FROM HELL, aka Ashy Sunflower, Downy Sunflower, Soft Sunflower (soft, from Latin *mollis*, swaying, swinging; pliant, tender, easily moved; soft, graceful, delicate.)
Habitat: Mesic and dry prairies. Roadsides and railroads. Full sun, often sandy soils. distribution Apparently native to the Midwest, but spreading. "*Helianthus mollis* is introduced in Ontario and adventive in the eastern United States (e.g., Maine), where it is continuing to spread, particularly along roads." (fna)
Culture: 30 days cold moist stratification (pm 09). Cold moist treatment Ken Schaal. "30 days moist stratification required for germination. Field sow fall." (pn nd)
Description: general form Erect to drooping perennial roots spreading rhizomes, dense colonies culms 4.0-5.0' (2.5-5.0), often multi-stemmed leaves opposite, ovate, clasping, turning black when dried or damaged flowers head 2" wide, yellow rays, disk slightly domed; bracts (phyllaries) short, curly, hairy N 2n = 34. key features "Readily recognized by: 1) broad, clasping leaves, 2) numerous spreading bracts, 3) extreme hairiness." (ilpin)
Comments: Blooms 8,9. Aggressive, spreads rapidly with moisture, auto-toxic??? Crowds out Canada Thistles, Bouncing Bet, itself, and desirable plants too! This is too aggressive for small plantings and gardens. For many years, a component of IDOT forb seed mixes. 112,000 to 242,113 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera. Favorite food of goldfinches.

Helianthus occidentalis Riddell *MD SHORT SUNFLOWER from HELL, Fewleaf Sunflower, Naked Sunflower, Naked-stemmed Sunflower, Western Sunflower (*occidentalis -is -e* of the west, western, from Latin *occidens*, *occidentis*, the west, towards the setting sun, and *-alis,* suffix of or pertaining to, as opposed to *orientalis* of China.)
Habitat: Hill prairies and sand prairies, occasionally in mesic prairies. Spreads rapidly with moisture.
Culture: Successional restoration in mature plantings. "No pretreatment needed, or cold moist treatment, or fall sow. Light cover. Very good germination. Self sows." (Dunham 1993). 30 days cold moist stratification (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Gni 2001 green house experience indicated the 'no treatment' method not successful.
Description: general form Erect perennial culms 2.0-3.0' no to few cauline leaves, relatively few basal leaves and scapiform stems leaves largest leaves basal on very long stalks, only 3-8 small opposite pairs on the stems, leaves entire or nearly so, scabrous or hirsute, rough to the touch flowers head 1 1/2" - 2 3/4" wide with 10-15 yellow rays, disk yellow; inflorescence of several heads in loosely-branched clusters N 2n = 34 key features "Species has long, naked stems (often red); reduced leaves (most near base of plant); involucral bracts narrow, spreading, or tightly pressed; long, slender rhizomes. Leaf venation may be pinnate or other." (ilpin) Stems with few small leaves, large basal leaves. "In its typical form, *Helianthus occidentalis* is distinctive with its relatively few basal leaves and scapiform stems." (fna)
Comments: Blooms 7,8,9. Aggressive, but reported as the best behaved local, perennial member of the genus, ALTHOUGH IT FORMS INSIDIOUS MONOCULTURES. The monocultures become weak in the center and will bloom only at the edges. Forms a dubious groundcover. This species can spread into and persist in a dry, mowed lawn.

"Disk florets are perfect and fertile; ray florets are sterile. Plants have antibiotic and autotoxic properties, some unique diterpenoid acids, and resist several insect pests of common sunflowers." (ilpin) (emphasis added) 151,200 to 224,000 seeds per pound. In diverse remnants, this and other *Helianthus* do not form large clones and are well behaved. In disturbed areas and plantings, most sunflowers form large, clones of mass destruction. Species occasionally crosses with *H. mollis*, *H. X cinereus* Torrey & A. Gray.

Helianthus rigidus (Cassini) Desfontaines. [It is popular to call this *Helianthus pauciflorus* Nuttall (*pauciflorus* with few flowers, from classical Latin *pauci-*, combining form of *paucus*, few)] LITTLE SUNFLOWER FROM HELL, aka Few-leaved Sunflower, Prairie Sunflower, Stiff Sunflower (*rigidus* rigid, stiff, inflexible. Latin *rigidus,* stiff, hard, unbending, stern, inflexible, rigid from the stiff leaves.)
Habitat: Dry, and sand prairies, mesic and dry savannas.
Culture: Most lots may be highly dormant, cold moist stratification is necessary. Successional restoration "30 days moist stratification required for germination. Field sow fall." (pn nd) Easy by division of rhizomes.

Description: A weed by any name. 3.0-6.0' Disks usually reddish-brown to purplish, sometimes yellow. Leaves mostly all opposite, up to 15 pairs, tapering to a short stalk, very rough, often folded along the midrib. N 2n = 102 key features "Leaves long - tapering and pointed at the tip; leaves of stem gradually tapering to a short petiole or nearly stalkless; upper leaves may be alternate. Involucral bracts mostly tapering to an acute tip. Forms dense colonies from creeping underground rootstocks." (ilpin) "Very similar to *H. x laetiflorus* but with shorter leaf stalks and reddish-purple disks. reddish-purple disk flowers, leaves mostly all opposite, short petiole, very rough, often folded up along the midrib." (fna)
Comments: Blooms 7-10. C3. Cut flowers, attractive dried seed heads weedy, allelopathic. A well-behaved dainty little plant of dry prairies, but "the sunflower from Hell" in mesic plantings. Keep this plant in the dry only, in the back 40, next to that neighbor you don't like. Very showy in years with normal to above rainfall. Spreads rapidly with moisture. WE HAVE WATCHED A 4-FOOT WIDE CLUMP GROW TO 50 FEET IN 10 YEARS. 64,000 to 250,000 seeds per pound.
Associates: Seed weevils may impact seed production. Readily grazed by livestock.
H. rigidus often hybridizes with *H. tuberosus* L. The hybrid is known as *H. ×laetiflorus*, and is frequently cultivated.

Helianthus strumosus Linnaeus *VT PALE-LEAVED SUNFLOWER, aka Harsh Sunflower, *Hélianthe scrofuleux,* Rough Sunflower, Rough-leaved Sunflower, Swollen Sunflower, Woodland Sunflower From Hell (*strumosus* having cushion-like swellings, from Latin for swelling or tumor.)
Habitat: Mesic savanna and oak woods. Open woods, wet meadows, roadsides and railroads.
Description: general form Native erect perennial forb roots rhizomatous culms 2-6', stems smooth below the inflorescence but often with a whitish fuzz leaves lower mostly opposite, upper becoming alternate; usually widely lance-like to narrowly oval, thick, firm, upper side rough to fuzzy, lower side fuzzy, short winged stalk, shallow or no teeth flowers heads 1 1/2" - 4" wide, 8-15 yellow rays, disk yellow; unequal bracts (phyllaries) usually the same or slightly longer than the disk, pointed, and slightly spreading N 2n = 68, 102 key features "Species is very diverse in appearance. It is called the "wastebasket" species by some." (ilpin) "It differs from *H. tuberosus* in having glabrous (or glabrate) stems and in lacking tubers" (fna). Stems smooth below the inflorescence, phyllaries pointed and slightly spreading, leaves wide lanceolate to narrowly oval, upper side rough to fuzzy, shallowly toothed or entire. (Freck.)
Culture: Successional restoration. 30 days cold moist stratification (pm 09). "30 days moist stratification required for germination. Field sow fall." (pn nd)
Comments: Blooms 7-10. Aggressive, allelopathic, will grow to the exclusion of other species. Variable leaf shape and indumentum. 67,200 to115,200 seeds per pound.

HELIOPSIS Persoon 1807 **Oxeye, Sunflower-everlasting** From Greek *helios* sun and *opsis* meaning resemblance, for similarity the flower heads to the sun. Small genus of American herbs resembling a sunflower with fertile ray flowers and a conical receptacle.
Seeds ripen late summer. Easy from dry stratified seed, Code A (Cullina 2000), but some species or lots will require cold moist stratification (Wade various years). Five to seven node stem cuttings in spring from the top foot are generally successful (Cullina 2000).

Heliopsis helianthoides (Linnaeus) Sweet FALSE SUNFLOWER, Heliopsis Sunflower, Oxeye, Smooth Oxeye (*helianthoides* like or resembling *Helianthus*, Sunflower.)
Habitat: Mesic, dry, hill, and sand prairies, mesic savannas, open woods. Dry soils.
Culture: "Cold moist treatment, or fall sow, or on pretreatment needed. Light cover. Excellent germination. Self sows." (Dunham 1993). 30 days cold moist stratification (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Easy from seed, no treatment / cold moist stratify may help some lots-successional restoration. Easy to grow. Blooms 1st or 2nd year from seed. Planted alone seed 8 oz. per 1,000 sq. ft. (Stock).
Description: Hardy perennial 2.0-5.0', shorter than most sunflowers, with numerous yellow daisy-like flowers. key features "Heads radiate on conical receptacles; rays yellow; achenes becoming papery. Pappus none (incomplete), or of 2-4 short teeth (complete flower), thus flower structure is not consistent. Concerning leaf venation, it may be pinnate or other." (ilpin)
Comments: This species is considered invasive in parts of its range. Blooms 6-10 Ethnobotanical uses, landscaping, good for roadside seedings and disturbed areas. Aggressive, self sows. 60,000 to 132,130 seeds per pound.
Associates: Attracts butterflies. Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera. Provides food and cover for upland game birds and songbirds.

HIERACIUM Linnaeus 1753 **Hawkweed, King-devil** New Latin, from Greek *hierakion* hawkweed, from *hierak-, hierax* hawk, from *hienai* to hurry. Large (250-1000 species) and nearly cosmopolitan genus of weedy perennial herbs and conservative wildflowers, having simple often-basal leaves and heads of yellow or reddish orange ray flowers. The

many apomictic races make definition of taxa difficult

Hieracium canadense Michaux CANADA HAWKWEED (*canadensis -is -e* of or from Canada or the north-east USA, of Canadian origin.)
Description/comments: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) 1,440,000 seeds per pound.

Hieracium longipilum Torrey HAIRY HAWKWEED, aka Long-Bearded Hawkweed (*longipilus -a -um* with long hairs.)
Habitat: Dry and sand prairies, old fields.
Description/comments: Easy from seed, fall plant or cold moist stratify. Yellow flowers 2.0-4.0' Blooms 7,8 113,400 to 1,360,000 seeds per pound

Hieracium scabrum Michaux HAIRY HAWKWEED, aka Rough Hawkweed (*scaber -bra -brum* scabrous, scabby, rough or gritty to the touch on account of numerous minute projections, from Latin *scaber*, scabby, rough.)
Habitat: Mesic and dry savannas.
Culture: Fall plant or cold moist stratify (Code C Ken Schaal).
Description: Yellow flowers, 3.0-4.0'. Blooms 8,9 Landscaping. 3,200,000 seeds per pound.
Associates: Pollinated by bees and Diptera.

KRIGIA Schreber 1791 **Cynthia, Dwarf Dandelion** *Krigia* New Latin, from David *Krig*, 16??-1713, 18th century American plant collector in Maryland and Delaware and New Latin *–ia*. About 7 species of small branched yellow-flowered North American herbs that are related to the chicories but resemble dandelions and have a pappus of both bristles and chaff and short achenes.

Krigia biflora (Walter) S.F. Blake CYNTHIA, aka Two-flowered Cynthia, Orange Dwarf-dandelion. (*biflorus -a -um* blooming in pairs, or having two flowers.)
Habitat: Rich woods.
Culture: Code C Wade. 60 days cold moist stratification (pm 09).
Description/comments: Yellow flowers, 8-24", Blooms 5-7. 640,000 seeds per pound.

KUHNIA False Boneset New Latin, from Adam Kuhn died 1817 American physician and botanist and New Latin –ia. North American perennial herbs with alternate resinous leaves and heads of cream-colored tubular flowers. Our species is often placed in *Brickellia* Elliott.

Kuhnia eupatorioides (Linnaeus) **corymbulosa** (Torrey & Gray) Shinners *MI FALSE BONESET (*eupatorioides* eupatorium-like; *corymbulosus -a -um* arranged in small corymbs or in small clusters.)
Habitat: Dry and sand prairies, dry savannas.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd)
Description/comments: Cream flowers, 2.0-3.0'. Blooms 8-10. Landscaping, aggressive. 384,000 to 512,000 seeds per pound. "A common, variable, dry soil weed that looks like a boneset. Dry prairies, sandy roadsides and railroads." (Fell 1955)

LACTUCA Linnaeus 1753 **Wild Lettuce, Lettuce,** aka **Milkweed** *Lactuca* lettuce, from Latin *lactuca*, a name used by Pliny, ..., *et ideo lactucis nomen a lacte,* Pliny describes lettuces, their seeds and planting, from *lact-, lac* milk; from its milky juice milky sap. Related to Lettuce, from Middle English *letuse*, from Old French *laitues*, plural of *laitue,* also related to galaxy, ie the Milky Way. A genus of about 75 species mostly north temperate nearly cosmopolitan. The yellow ray flowers of some species may dry blue.

Lactuca floridana (Linnaeus) Gaertner BLUE LETTUCE, aka Woodland Lettuce (*floridanus -a -um* of or from Florida, USA.)
Habitat: Mesic savanna, moist woodlands.
Culture: Seeds need light.
Description: Blue flowers, 3.0-5.0'. Blooms 8,9. 188,992 seeds per pound.

Lactuca ludoviciana Nuttall (Riddell) PRAIRIE LETTUCE, aka Louisiana Lettuce (*ludovicianus -a -um* of Louisiana, or St. Louis, the western USA at that time; a reference to King Louis XIV (named by La Salle) (Ludvig is a Germanic version of Louis), and by extension, to the Louisiana Territory (or Louisiana Purchase) or a reference to the State of Louisiana, which was named after King Louis.)

(Code C, biennial Ken Schaal). 912,000 seeds per pound.

LIATRIS Gaertn. ex Schreb. (or just Schreber 1791) (Formerly *Lacinaria*) **Blazing-star, Gayfeather** *Liatris* New Latin, derivation obscure, unknown. Possibly Greek λεια, *leia,* booty, or λειος, *leios,* smooth or bald. Or perhaps the color of some species is reminiscent of the color of a *liatico,* a red Tuscan wine, imagine Schreber in his study, considering this purplish New World composite over a glass of red wine. A genus of about 40-50 species of perennial eastern and central North American herbs having aromatic often cormous roots, linear grassy leaves, and spikes of rose-purple or white, or yellow discoid heads of perfect tubular flower. All species cold moist stratify or fall plant-division, cut flowers, dried flowers, landscaping, attracts butterflies, upland gamebirds, songbirds, and small mammals. The genus is somewhat promiscuous, with several known hybrids. Seeds are achenes with tufts of hair. Several species are mass-produced for cut flowers.

"Cold moist treatment, or fall sow. Light cover. Good germination. Watch over watering. Transplant when small corm is formed." (Dunham 1993). Seed matures in the fall. Young seedlings are sensitive to root disturbance. Code A but treat as B. Two-inch long softwood stem cuttings. Division of mature corms in winter. (Cullina 2000) There may be germination inhibitors in the pappus.

Levin and Kerster (1969) experimented with rows of *Liatris aspera* and *L. cylindracea* set crosswise to prevailing winds. With 10-20 mph winds, mean dispersal of both seeds was 2.5 meters, maximum 9 meters. *Liatris aspera* is twice as tall as *L. cylindracea,* which would seemingly imply greater dispersal distance. The distance was the same because *L. cylindracea* has a large plumose pappus and *L. aspera* has a small barbellate pappus. A bigger parachute helps.

Most Midwestern *Liatris* form corms, a few form a caudex or horizontal rhizomes; the corms have contractile roots, which literally pull the developing corms into the soil. When *Liatris* are grown from seed, the 1st year corms are formed at the soil surface or to ½" deep. If you have ever salvaged a *Liatris*, you have seen the corms are 4-6" deep in the soil. Contractile roots are thick, fleshy roots that push the soil aside, elongate, anchor, and then contract, pulling the corm deeper a little every year. When a region of stable soil temperatures develops, contractile roots are no longer formed. In the built up soils of commercial restoration sites, contractile roots cannot penetrate the compacted soils, and the exposed corms are usually eaten by critters or perish from exposure.

When harvesting ripening *Liatris* seeds, always clip the stem. Many people strip the seeds from the stem by hand. This disturbs the roots to the extent the plants may not flower the following year, or the plant may die.

Liatris aspera Michaux BUTTON BLAZINGSTAR, aka Rough Blazing Star, Tall Blazingstar (*asper-, aspera* rough, sharp to the touch, from Latin *asper*, adjective, rough.)
Habitat: Mesic, dry, hill, and sand prairies. Open sand savannas. Drought resistant.
Culture: Some say this and the following are easy from dry stratified seed. Our 1999 crop seed was the first year we debearded seed, and germination began after 10 days in an unheated coldframe. Is there a germination inhibitor in the pappus? The same results were noted with hulled *Parthenium integrifolium*.

60 days cold moist stratification (pm 09). "30 days moist stratification requires for germination. Field sow fall." (pn nd)
Description: Spikes of purple flowers. 2.0-4.0'
Comments: Blooms 8-10. C3. 183,657 to 311,813 seeds per pound.

"Our common species, being plentiful in sand areas and the prairie hills south and east of Rockford. Very variable as to pubescence, denseness of the spike, length of peduncles, etc. White forms are occasional." (Fell 1955)
Associates: Pollinated by bees, butterflies, and flies.

Liatris cylindracea *OH DWARF BLAZING STAR, aka Barrelhead Blazing-star (*cylindraceus -a -um* cylindric, of cylindrical form.)
Habitat: Sand stone and limestone prairies, dry open woods. In the se USA limestone glades (Weakley 2008).
Culture: Debearded seed needs no treatment, otherwise cold moist stratify or fall plant. 60 days cold moist stratification (pm 09). Division in spring.
Description: Attractive spike of individual purple flowers, 0.5-1.5' "Heads are few or solitary." (ilpin)
Comments: Blooms 7-10. Rock gardens, non-competitive, drought resistant. 148,800 to 224,000 seeds per pound.
"Dry prairies and gravel hills. Not uncommon especially on the gravel prairie hills bordering Rock River." (Fell 1955)
Associates: Pollinated by bees, butterflies, and flies.

Liatris pycnostachya *IN PRAIRIE BLAZING STAR, aka Button Snake Root, Cattail Gayfeather, Kansas Gayfeather, Thickspike Gayfeather (*pycnostachyus -a -um* with densely or thickly clustered flower spikes, from Greek πυκνος, *pycnos*, dense, *-o-* , Greek σταχυς, *stachys*, spike, ear of grain, and *–us*.)
Habitat: Wet meadows, mesic prairies, moist prairies, fields, and meadows. Low to moderate moisture requirements, full sun. Prefers moist, but well drained sites. Best in moderately coarse to medium, textured soils. Neutral to basic soils.

Culture: 60 days cold moist stratification (pm 09). "30 days moist stratification required for germination. Field sow fall." (pn nd) Easy from moist stratified seed. In single species plot plant 4.8 oz. per 1,000 ft. sq. (stocks). Pure stand plant 12 lb per acre (granite).
Description: The tallest of the blazingstars, 2.0-4.0'. Native perennial, 24-60", with rose-purple flowers in crowded cylindric, spike-shaped head.
Comments: Blooms 7-9. Short lived, said by some to be drought resistant. We noted in the dry years of 1988 and 1989, this species was not evident above ground in some remnants, but it returned in the following moister years. Used in gardens, for cut flowers, and for dried flowers. 126,336 to 192,000 seeds per pound.

"Found in low places in the sand areas and in low prairie situations in the Searle tracts, on the C. & N.W. Ry. east of Winnebago, etc. Also in the contiguous counties. Used somewhat as a garden plant. (*L. bebbiana* Rydb.)" (Fell 1955)

Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera. Attracts butterflies and hummingbirds.

Liatris scariosa (Linnaeus) Willdenow var. **nieuwlandii** (Lunell) E.G. Voss *IL, ME NIEUWLAND'S BLAZING STAR, Savanna or Meadow Blazing Star (*scariosus -a -um* scarious, thin and not green, dry and membranaceous, shriveled(?), new Latin *scarious*, dry and membranous in texture)
Habitat: Bur oak white oak savanna.
Culture: (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09). "30 days moist stratification required for germination. Field sow fall." (pn nd)
Comments: C3. 160,000 to 280,000 seeds per pound.

Liatris spicata (Linnaeus) Willdenow DENSE BLAZING STAR, aka Florist's Gayfeather, Marsh Blazing Star, Spiked Gayfeather (*spicatus -a -um* with flowers in a spike, spicate, bearing a spike, from Latin *spicatus*, past participle, *spico*, to grow ears, spikes, like wheat or corn (in an Old World sense.)
Habitat: Wet meadows and mesic prairies. Low lying moist areas, prairies, and meadows. Moderate moisture requirements. Full sun. Moderately coarse to moderately fine soils. Neutral soils, some acid and base tolerant. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement low. Salinity tolerance low. Shade tolerance intermediate. pH 5.6-7.5.
Culture: This species has been cultivated long enough that seed dormancy has been bred out of some cultivars, or possibly germination inhibitors are present in the pappus, which is normally removed. 60 days cold moist stratification (pm 09). "30 days moist stratification required for germination. Field sow fall." (pn nd) Fall plant, or cold moist stratify 1-2 months and sow in spring (pots 2000). In single species plot plant 4.8 oz. per 1,000 ft. sq. (Stocks). Pure stand plant 12 lb, per acre (granite). Growth rate slow. Seedling vigor low. Vegetative spread rate slow.
Description: Native perennial 12-30", with rose-purple flowers in stiff, crowded cylindric, spike-shaped head 2-3', not as tall as *L. pycnostachya*, with a more slender inflorescence. (Granite says it grows to 72", ecs 60"). 14' minimum root depth.
Comments: Blooms 7-9. Very popular commercial cut flower, also dries well. Attracts butterflies and humming birds. Short lived, calcareous soils, somewhat flood tolerant. 100,000 to 192,000 seeds per pound.

"Very uncommon, we having found it only on the C. & N.W. Ry. r. o. w. west of Cherry Valley. It is also used as a garden plant." (Fell 1955)

PACKERA Á. & D. Löve 1976 **Ragwort** See *Senecio*. *Packera* for John G. *Packer*, b. 1929, Canadian botanist and biosystematist. A genus of about 64 species of annual and perennial herbs of subtropical, temperate, and arctic North America with few species in Siberia. Formerly treated as the 'aureoid' group of *Senecio*.

PARTHENIUM Linnaeus 1753 **Wild Quinine, Bastard Feverfew, Rupture-wort** New Latin, from Greek *parthenion* feverfew, from neuter of *parthenios* maidenly, from *parthenos* maiden, virgin, in reference to the white flowers. A genus of about 16 species of North American and West Indies herbs and shrubs having small heads of rayed flowers in a terminal panicle. A tropical member of this genus, adventive in the southern US, *P. hysterophorus,* BASTARD FEVERFEW, is the worst agricultural weed in the world, and is highly phytotoxic. Hmmm.

Parthenium integrifolium Linnaeus *MA, MN, PA, WI WILD QUININE, aka American or Eastern Feverfew, Eastern Parthenium
Habitat: Mesic, dry, and sand prairies, dry open woods, and rocky woods. Tolerates dry clayey soils.
Culture: Easy from seed, cold moist stratify or fall plant. "Cold moist treatment or fall sow. light cover. Good germination." (Dunham 1993) 60 days cold moist stratification (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall." (pn nd)
Description: Perennial herbaceous forb. Long lasting white flowers, 4-6mm wide, composed of sterile disk flowers and usually five short ray flowers. 2.0-4.0'.
Comments: Blooms 6,7,8,9. Good cut flowers and attractive dried seed heads. Flowers, stems and seeds have a mild medicinal smell. Several medicinal uses. 112,000 to 294,710 seeds per pound.

Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Coleoptera, and Hemiptera.

PRENANTHES Linnaeus 1753 **Rattlesnake-root** *Prenanthes* New Latin, from Greek *prenes* drooping, face downward, prone (akin to *pro* before, forward) and New Latin *-anthes, -anthos*, flower, for the drooping flower heads. About 30 species of North American and Asiatic perennial herbs with lobed or pinnatifid leaves and small heads of drooping ligulate flowers. Fruits are achenes with tufts of hair. Some authors place the North American taxa in the genus *Nabalus*.

Prenanthes alba Linnaeus WHITE LETTUCE, aka Northern Rattlesnake-root, Rattlesnake Root, White Rattlesnakeroot (*albus -a -um* from Latin, *albus*, white, particularly a dull rather than a glossy white, or dead white; pale; bright; general white.**)**
Habitat: Mesic savanna and woodland.
Culture: Cold moist stratify or fall plant. "Cold moist treatment, or fall sow. Light cover. Good to fair germination." (Dunham 1993) 60 days cold moist stratification (pm 09).
Description: White flowers, 2.0-4.0'.
Comments: Blooms 9-11. Ethnobotanical uses landscaping. 174,464 to 328,000 seeds per pound.

Prenanthes aspera *IN-WI ROUGH WHITE LETTUCE, aka Rough Rattlesnake-root (*asper-, aspera* rough, sharp to the touch, from Latin *asper*, adjective, rough.)
Habitat: Mesic and dry prairies.
Culture: Cold moist stratify (120?) / fall plant, easy from seed. "Cold moist treatment, or fall sow. Light cover. Good to fair germination. (Dunham 1993) 60 days cold moist stratification (pm 09).
Description: Cream flowers. 3.0-5.0'
Comments: Blooms 8,9. Landscaping. 174,464 seeds per pound
Associates: Pollinated by long-tongued bees.

Prenanthes racemosa GLAUCOUS WHITE LETTUCE (*racemosus -a -um* with flowers borne in racemes, in the form of a cluster of grapes, for the elongated inflorescence. New Latin from *racemus*, *recemus,* the stalk or a cluster of a bunch of grapes, and *–osus,* plenitude or notable development, with a raceme, a cluster of flowers each on their own stalk and arranged along a single central stem.**)**
Habitat: Mesic, moist, to wet prairies
Culture: Cold moist stratify (120pm) / fall plant, easy from seed. 120 days cold moist stratification, or best planted outdoors in the fall. (pm 09)
Comments: Blooms 7-10.
Associates: Pollinated by bees.

RATIBIDA Rafinesque 1817 **Prairie Coneflower, Yellow Coneflower** *Ratibida* derivation unknown, possibly from a comment by Rafinesque, 1819, "Journal de physique, de chimie et d'histoire naturelle et des arts" stating the *ra*ys are *bi*fid, hence possibly *rat*i*bi*da. (admittedly, one heck of a long shot) A genus of about 7 species of perennial North American composite herbs which are sometimes cultivated for their showy flower heads. Fruits are achenes

Seeds ripen late summer. Seeds may germinate after 90 days storage at 70º, but cold moist stratification is more uniform. Code A or B. Cullina (2000)

Ratibida pinnata (Ventenat) Barnhart *PA YELLOW CONEFLOWER, aka Drooping Coneflower, Globular prairie Coneflower, Gray Headed Prairie Coneflower, Pinnate Prairie Coneflower (*pinnatus -a -um* pinnate, feathered, the primary division of a compound leaf, from Latin *pinnatus*, adjective, feathered, winged.)
Habitat: Mesic, dry, hill, and gravel prairies, mesic and dry savanna. Mesic prairie species. low to moderate water requirements, full sun. Adapted to wide range of soils. Will stand partial shade. Drought tolerant. Tolerant of loam, clay, or sandy soils. No inundation tolerance. Nutrient load tolerance low to moderate. Siltation tolerance low. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance high. Fertility requirement medium. Salinity tolerance none. Shade intolerant, full sun. pH 5.6-6.8. Neutral soils, pH 6-7 "prefers calcareous soils that are neutral." (usda cs_rapi). distribution A standard plant of Midwestern prairies and limestone glades, with a disjunct population in South Carolina Piedmont prairies.
Culture: Establishes easily from seed. Field sow in spring or fall. Stratification @ 33-38° F for 30 days helpful, but not essential. Easy from cold moist stratified seed (30 days). 30 days cold moist stratification (pm 09). "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) When planted alone, use 0.9 oz. per 1,000 sq. ft. (Stock). Pure stand plant 5 lb (usda) or 6 lb per acre (granite). In mixes plant 0.31 to 0.125 lb pls per acre. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.

Established plants can be divided in the spring.
Description: Native perennial herb, 18-48", with 5-10 showy, drooping, yellow ray flowers around black or gray disk. Dry seed heads are aromatic. 14" minimum root depth.
Comments: Blooms 7-9. Cut flowers, dried seed heads, landscaping, makes attractive background. Tall, showy species, aggressive, erosion control, good soil stabilizer in upper slope buffers. Early successional. 432,000 to 800,000 seeds per pound.
Associates: Pollinated by bees and butterflies. Attracts butterflies and other insects-upland gamebirds, songbirds, ungulates. Seeds are readily eaten by birds. Young growth palatable to grazers, but not the older woody stems. Palatable to livestock, decreases under grazing.

RUDBECKIA Linnaeus 1753 **Coneflower, Black-eyed Susan** After the Swedish father and son, Olof J. Rudbeck the elder (1630-1702), and Olof O. Rudbeck the younger (1660-1740), both professors of botany at Uppsala and predecessors of Linnaeus. A genus of about 15 species of North American perennial herbs having showy pedunculate flower heads with a hemispherical involucre, mostly yellow ray flowers, and a conical chaffy receptacle. Yellow flowers attract butterflies, upland gamebirds and songbirds. Fruits are achenes.

Seeds ripen late summer to early fall. Seeds may germinate after 90 days storage at 70º, but cold moist stratification is more uniform. Code A or B.

Rudbeckia fulgida Aiton *IN, NJ ORANGE CONEFLOWER (*fulgidus -a -um* fulgid, shining, brightly colored, gleaming, radiant, glittering, from Latin *fulgidus -a -um*, shining , gleaming, glittering.)
Culture: (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09).
Comments: Blooms 6-10. C3. 496,000 to 585,806 seeds per pound.

Rudbeckia hirta Linnaeus *NY BLACK-EYED SUSAN, CONEFLOWER (*hirtus -a -um* hairy, with short or stiffish hairs, hairy but shorter than hirsute, from Latin *hirtus*, rough, hairy, shaggy, or rude, rough, unpolished, uncultivated.)
Habitat: Present in most native habitats, hill, gravel, sand, dry, mesic, and degraded prairies, roadsides, mesic to wet prairies. "Very flexible and adaptable species, prefers dry, poor acid soil" (KRR). Open woods, thickets, barrens, fields, and waste ground, fields, roadsides, open woods. Mesic or dry fields, prairies, open woods, coarse or fine textured soils, adapted to wide range of soils. Tolerates some shade. Low to moderate water requirement. Full sun to partial shade. Coarse to moderately fine soils. Limited flooding tolerance. Nutrient load tolerance low to moderate. Siltation tolerance low. Partial to full sun. Tolerant of medium and fine textured soils, but best developed on sandy soils. Anaerobic tolerance none. CaCO3 tolerance none. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 6.0-7.0 (usda), or 4.5-7.5.
Culture: 30 days cold moist stratification (pm 09). Easy to grow. Easily established from seed. No pretreatment necessary, cold moist stratify may help. "from transplants and moist stratified seed" (KRR). "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Broadcast 2 pls lbs per acre in fall or early spring. Stocks recommends 0.8 oz. per 1,000 ft. sq. planted alone. Pure stand plant 2 lb per acre (granite). In mixes plant 0.125 to 0.3 lb pls per acre (USDA 1997). Sow spring to late summer, cover lightly (pots 2000). Growth rate rapid. Seedling vigor medium. Vegetative spread rate none.

When using greenhouse transplants, this species will often behave as an annual, making transplants absolutely pointless for native applications.
Description: Native biennial or short-lived perennial, occasionally annual, especially when greenhouse grown. Semi-erect, 18-24", with large yellow-orange sunflower-like flowers with black or brown center. 10" minimum root depth.
Comments: Blooms profusely 6-9. Fibrous root system helps stabilize soils. Can be very aggressive, early successional. Ethnobotanical uses good cut flowers and attractive dried seed heads. 1,254,144 to 1,710,000 seeds per pound.

Rudbeckia laciniata Linnaeus CONEFLOWER from HELL, aka Cutleaf or Tall Coneflower, Cut-leaved Coneflower, Expletive Deleted Coneflower, Green-headed Coneflower, Wild Golden Glow, *gi'zuswe'bigwa'is*, "it is scattering" (Ojibwa) and boy does it! (*laciniatus -a -um* lacinate, torn, deeply cut, fringed, slashed or lacerated, cut into narrow divisions or lobes, jagged, from Latin *lacinia*, a small piece of cloth to be sewn on a garment for lapels, and *-atus*, indicating possessive of or likeness of something, shaped, made, generally referring to the deeply for cut leaves.)
Habitat: Urban floodplains. Also moist ground, wet savannas, upland swamps, fens, wooded alluvial bottoms. Tolerant of coarse, medium and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 4.5-7.0. distribution: Widespread species with four regional varieties.
Culture: Cold moist stratify or fall plant. 30 days cold moist stratification (pm 09). "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, early spring." (pn nd)
Description: WEEDY Subshrub forb, aggressively rhizomatous. Yellow rays with green disk, 4.0-10' Growth rate rapid. Seedling vigor medium. Vegetative spread rate moderate. 12" minimum root depth

Comments: WEED. This is listed as a weed in Weeds of the North Central States. Blooms 7-10. One of the plants you put along the fence by the neighbor you don't like. Aggressively rhizomatous, highly competitive to the exclusion of other species, phytotoxic, and autotoxic. This should only be used in urban floodplains. Ethnobotanical uses, wetland restoration, aggressively rhizomatous, calcareous. 207,022 to 252,222 seeds per pound.

Double flowered garden plants are *Rudbeckia laciniata* cv. *Hortensia*, DOUBLE GOLD

R. speciosa Wenderoth var. **sullivantii** (C.L. Boynton & Beadle) B.L. Robinson SHOWY BLACK-EYED SUSAN, aka Sullivant's Orange Coneflower (*speciosus -a -um* beautiful, showy, spectacular, splendid, good-looking. From Latin *speciosus*, beautiful, handsome, good-looking; attractive, appealing; presentable, respectable, imposing; spectacular; *sullivantii* for William Starling *Sullivant*, 1803-1873.)
Habitat: Wet meadows, fens, and drier prairies.
Culture: Cold moist stratify or fall plant. 30 days cold moist stratification (pm 09).
Description: Yellow flowers, 1.0-2.0'. Often stoloniferous. "Rays usually becoming reflexed. A low, hemispherical, dark disk. Leaf venation may also be parallel." (ilpin)
Comments: Blooms 7-9. Landscaping, calcareous. 496,000 to 585,806 seeds per pound.

New nomenclature this will be *Rudbeckia fulgida* Aiton var. *sullivantii* (C.L. Boynton & Beadle) Cronquist.

Rudbeckia subtomentosa Pursh * KY, MI, TN SWEET CONEFOWER, aka Black Eyed Susan, Fragrant Coneflower, Sweet Black-Eyed Susan (*subtomentosus -a -um* somewhat hairy, from Latin *sub*, below, under, almost, less so than a similar plant, and *tomentum*, hairy, from the noun *tometum*, stuffing for cushions: wool, feathers, and *-osus*, plenitude, notable development.)
Habitat: Dry to moist prairies, moist woods and wood edges and stream banks. Peat or wet sands, drainage ditches, wet open woods and thickets, sand prairies, prairie/woodland border.
Culture: Seed needs no treatment, cuttings used. (pph) Cms or no treatment (Wade 1995) "Cold moist treatment, or no pretreatment, or fall sow. Light cover. Very good to excellent germination" (Dunham, 1993) 30 days cold moist stratification (pm 09). "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer.". (pn nd) Cold moist stratify helps. Division of mature clumps in spring.
Description: 2.0-5.0' Yellow flowers 1.5-4.0" across with purple-brown disk, bracts with whitish hairs near tips, leaves oval to elliptical, especially hairy below key features "Lower to all leaves 3-lobed to 5-7 parted, upper leaves usually simple. Disk of flower head dark brown-purple. Peduncles and at least the upper stem short-hairy or downy, leaves thick and firm, usually densely short-hairy on lower surface; pales (receptacle chaff) short-tipped, short-hairy, glandular on back, glandular on margins also; rays yellow, 12-20; stout rhizome present." (ilpin)
Comments: Blooms 7,8,9. Cut flowers, dried seed heads, landscaping. 688,000 to 991,266 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, and Hemiptera. Provides food and cover for birds.

Rudbeckia triloba Linnaeus * FL BROWN EYED SUSAN, aka Three Lobed Coneflower (*trilobus -a -um* three lobes, from Latin *tri*, prefix from *tres*, three, and Late Latin *lobus*, husk, pod noun from Greek λοβος, *lobos*, lobe of the ear, liver, or lung, also a capsule or pod of a legume.)
Habitat: Stream banks, edges of fens, moist bottomlands, wet prairies, open woods.
Culture: 30 days cold moist stratification (pm 09). "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Cold moist stratify or fall plant helps.
Description: Annual, biennial, or short lived perennial, 3.0-5.0', yellow to orange ray flowers with dark brown disks
key features "Disc dark purple-brown. Leaves thin, sparsely long-haired underneath, upper stem with long spreading hairs. Pales (receptacle, chaff) sharp, pointed and glabrous." (ilpin)
Comments: Blooms 7-10. Landscaping. 505,850 to 548,972 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, and Lepidoptera.

SENECIO Linnaeus 1753 **Butterweed, Groundsel, Ragwort** *Senecio* from New Latin, from Latin *senecion-, senecio*, old man, groundsel, from its hoary pappus, or from *senex* old, old man, for the fluffy white seed heads resembling the white hair of an old man. As broadly defined, a large genus of 1500-2000 species of herbs, shrubs, trees, vines and tender succulents. See *Packera* A. Löve & D. Löve. (x = 20, 22, 23) Fruits are achenes with tufts of hair.

Seeds may be hydrophilic. Dry briefly, clean, and store in a zip-lock bag in the refrigerator.

Senecio plattensis Nuttall *WI [new nomenclature *Packera paupercula* (Michaux) Á. & D. Löve] PRAIRIE RAGWORT, aka Platte Groundsel, Prairie Groundsel (*plattensis* pertaining to the Platte River area, in the Great Plains?, or a derivative of *plattus,* flat, smooth, ancient Greek πλατύς.)
Habitat: Sandy prairies, hill and gravel prairies, old fields, and dry woodlands, common in northern and western Illinois.

Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratification, easily established from moist stratified seed or transplants.
Description: Biennial or perennial, 1.0-2.0' Yellow flowers. Short caudex, sometimes rhizomes. 2n = 46, 92.
Comments: Blooms 5,6, moderately aggressive, rhizomatous. 1,216,000 seeds per pound.
Associates: Pollinated by Diptera, Lepidoptera, Hymenoptera. Causes Missouri Bottom disease in livestock.

SILPHIUM Linnaeus 1753 **Rosinweed** Latin *silphium*, plural *silphia*, from Greek *silphion,* σιλφιον, of North African or Semitic origin, referring to an extinct umbelliferous plant of the genus *Ferula***,** sometimes seen as *F. silphium,* not definitely identifiable as to species but well known to the ancient Greeks, Romans, and North Africans and used by them medicinally, and as a spice or vegetable, from a name used by Apicus and Pliny. *Silphion* is pictured on ancient coins of the city of Cyrene, and was an important trade item. Reported to have disappeared about Nero's time, with Nero receiving the last stem or root. The spice was replaced by Persian *laser.* The same type of spice plant as *Ferula assa-foetida*, *Asafoetida*, aka *laserpitium, laser, lasar*, aka *silphium*. *Ferula* is Latin for giant fennel, or a stick or cane, especially one used to punish people, especially servants and students. Tall North American perennial herbs, 20-30 (12) species, having coarse heads of yellow flowers with fertile rays and broad flat winged achenes. x = 7.

The seeds ripen in late summer to early fall. Only the ray flowers set seed. The seed is surrounded by large fleshy chaff that resembles the seed. The genus in our area is propagated by cold moist stratify (10-30) or fall plant, easy from moist stratified seed and transplants. "30 days moist stratification necessary for germination. Field sow fall." (pn nd) "Cold moist treatment or fall sow. Light cover. Good to fair germination. *S. perfoliatum* has excellent germ." (Dunham 1993). Seedlings have very large cotyledons and may be transplanted at that stage. The roots quickly elongate. Code B (Cullina 2000). Seed tests reveal that *S. laciniatum* and *terebinthinaceum* almost always have higher dormancy percentages than *S. integrifolium* and *perfoliatum.* Yellow perennial sunflower-like flowers. Attracts butterflies, upland gamebirds, songbirds, and small mammals. Soil forming.

According to Weakley (2007), the number of ray flowers per head (or achenes) can be useful in determining Silphium species. (*The se USA has 22 taxa to consider. Illinois is lucky with only 5 highly distinctive species.)*

Silphium integrifolium Michaux *MI ROSIN WEED, aka Prairie Rosinweed, Wholeleaf Rosinweed (*integrifolius -a -um* with leaf margins entire, having leaves with unbroken smooth edges, with undivided leaves, from Latin *integer*, entire, whole, complete; unbroken, unhurt; fresh, new, and *folius*, from *folium*, leaf.)
Habitat: Wet, mesic, dry, and hill prairies, mesic and dry savannas.
60 days cold moist stratification (pm 09).
Description: 3.0-4.0'. 2n = 14. "Plants with alternate leaves are suspected hybrids of *S. integrifolium* and *S. astericus*. Broad corymb, leaves scabrous on both surfaces -with a short woody rhizome - may also have creeping rhizomes. Achenes obovate, winged, with a deep, narrow apical sinus." (ilpin)
Comments: Blooms 7-9. Cut flowers, landscaping, aggressive. 19,200 to 41,064 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, and Diptera. Provides cover and food for wildlife.

Silphium integrifolium Michx. *deamii* Perry DEAM'S ROSIN WEED is placed in synonymy with variety *integrifolium* (fna).

Silphium laciniatum Linnaeus *MI OH COMPASS PLANT, aka Rosinweed (*laciniatus -a -um* lacinate, torn, deeply cut, fringed, slashed or lacerated, cut into narrow divisions, jagged, from Latin *lacinia*, noun, small piece of cloth to be sewn on a garment for lapels, etc, and *-atus*, possessive of or likeness of something, generally referring to the deeply cut leaves.) The common name is from the tendency of the basal leaves to orient themselves north to south, orienting the least amount of surface area to the sun in the hottest part of the day. This aspect, the hairyness, and the deeply cut leaves are all drought adaptations.
Habitat: Mesic and dry prairies, mesic prairie soil. Mesic prairie species, not tolerant of artificial inundation in urban restorations, but tolerates seasonally high waterlevels in natural areas such as sedge meadows and wet prairies. pH 4.5-7.5. Nutrient load tolerance low. Salt tolerance not available. Siltation tolerance low. Full sun.
Culture: 60 days cold moist stratification (pm 09). Easily established from seed. Fall seed or cold moist stratify 10-60 days @ 33-38°F prior to planting. Although they are large seeded, *Silphiums* have some photodormancy and can be planted too deeply. Light cover only. ½ inch will be too much for some seeds, and will impair germination. In mixes, plant 0.03 to 0.188 pls lbs per acre (USDA 1997).

Container grown plants are preferable to bare root material for ease of establishment.
Description: Perennial herb 4.0-10'. 2n = 14. "The upper stem produces a gummy substance during flowering. Leaves deeply pinnatifid, extending well up the stem; phyllaries coriaceous in age, long-acuminate. Woody tap root." (ilpin)
Comments: Blooms July to September. C3. Cut flowers, landscaping. Useful in upper slope buffer stabilization. Slowly growing plant, usually only one or two leaves the first year. Protection may help. Once established a very aggressive seeder. 10,400 14,598 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, and Lepidoptera. Songbirds eat seeds. Deer graze foliage. Attracts butterflies and food source for silphium weevil.

Silphium perfoliatum Linnaeus*MI, CT CUP PLANT, aka Carpenters Weed, Common Cup-plant, Indian Cup (leaves joined around stem, from Latin *per*, prefix, through, extra, very, and *foliatus*, adjective, provided with or having leaves.)
Habitat: Flood plains, wet meadows, wet and mesic savannas, fens, open woods and low ground. Tolerant of fine textured soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 6.0-8.0.
Description: 4.0-8.0', square stems and opposite, toothed leaves with their bases united around the stem. One-inch golden-yellow flowers, with only the ray flowers fertile.
Culture: 60 days cold moist stratification (pm 09). USDA recommends the seed be stratified for twelve weeks and then sown at 24 to 32ºF for four to eight weeks, and then moved to 68ºF for germination, or sown in a greenhouse as soon as ripe. Growth rate slow, according to USDA, but not so here in the Corn Belt. Seedling vigor medium. Vegetative spread rate slow.
Comments: In Connecticut, this plant is considered potentially invasive and is banned. Blooms 7-9. Wetland restoration aggressive. 22,400 to 33,600 seeds per pound.
Associates: Sensitive to herbicide☠ drift and seed set is sensitive to insect damage. This plant is used on a limited scale as animal forage. Provides wildlife food and cover and nectar.

Silphium terebinthinaceum Jacq. *IA PRAIRIE DOCK, aka Basal-leaved Rosin-weed, Dock Rosin-Weed, Prairie Rosinweed (*terebinthinaceum* from Latin *terebinthus*, from Greek *terebinthos*, and *-inus,* the terebinth tree, a small European tree, *Pistacia terebinthus,* yielding Chian turpentine, a yellow to brown semifluid oleoresin. *Terebinthus* evolved into the Middle English *terebentyne, terbentyne, turpentine.*)
Habitat: Wet meadows, mesic and dry prairies, and mesic savanna. Mesic or dry prairie soil. Wet prairie or sedge meadow species, may tolerate 0-6" of flooding for short periods in spring. pH 4.5-7.5. Nutrient load low to moderate, salt tolerance low, siltation tolerance low to moderate. Full sun.
Culture: 60 days cold moist stratification (pm 09). Easy from seed. Sow fresh seed in fall with light cover, or cold moist stratified seed in spring. In mixes plant 0.03 to 0.188 pls lbs per acre (USDA 1997). Stratified seed planted in late summer will produce bare root transplants for following spring. Use transplants in early spring or fall, or stratified seed in spring.
Description: Perennial herb, 4.0-8.0', up to 10' yellow flowers. 2n = 14.
Comments: Blooms July to September. Cut flowers, landscaping. Useful in upper slope buffer stabilization. Can be an aggressive self-seeder. 16,000 to 25,316 seeds per pound.
flowers, landscaping. Useful in upper slope buffer stabilization. Can be an aggressive self-seeder. 16,000 to 25,316 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, and Diptera. Palatable to grazers. Attracts butterflies and other insects. Seeds provide food for birds

SOLIDAGO Linnaeus 1753 **Goldenrod** (includes *Euthamnia* Nutt. Ex Case GOLDENTOP and *Oligoneuron***)** From Latin *solido*, to make whole or strengthen, for its medicinal properties; New Latin, from Medieval Latin *soldago*, an herb reputed to heal wounds, from *soldare* to make whole, from Latin *solidare*, from *solidus* solid. A genus of 80-100 herbaceous species (after the split) primarily of North America, with a few species in South America, Macronesia, and Eurasia. Again, some terrible, not necessarily new, subgeneric names are waiting in the wings. With luck, they won't make it to northern Illinois' typically anachronistic usage for a while. Many authors have split *Brintonia, Chrysoma, Euthamia*, and *Oligoneuron* from *Solidago.* In some texts, the inflorescence is called the array. x = 9.

Seeds ripen in the fall. Collect seeds when the heads brown and the pappus starts to expand. Cold moist stratify or fall plant gives most consistent germination. Code B. 4-6 node stem cuttings in late spring root easily. Most species can be divided in the spring. (Cullina 2000)

Yellow flowers attract butterflies, upland gamebirds, songbirds, and small mammals. Upland gamebirds eat leaves. Songbirds eat seeds. Aquatic and terrestrial furbearers eat foliage and plants. Small mammals eat seed heads and foliage. Deer eat plants. Various lace bugs, leafhoppers, seed beetles, leaf beetles, and *Lygus lineolaris* (Tarnished Plant Bug) feed on the plant. Flowers provide nectar for Edward's Hairstreak, *Satyrium edwardsii.* Fruits are achenes with tufts of hair. **THIS GENUS DOES NOT CAUSE ALLERGIES!** (*In 2007, there were Solidagos in the seed mixes for Sherman Hospital in Elgin, but the Brain Trust involved eliminated them from the project. This is our informed and enlightened medical system, and a native consultant who buckled and sold out to the man.*) Known to chemically inhibit sugar maple, red pine, tulip poplar, and black cherry. (Chick and Kielbaso 1998).

Solidago altissima Linnaeus TALL GOLDENROD, Goldenrod, Late Goldenrod, *verge d'or haute* (*altissimus -a -um* highest, very high, very tall, tallest, superlative of *altus*, and *–issimus*, superlative suffix; most so, to the greatest degree; most-, -est.)
Habitat: Open disturbed habitats.

Description: Tall WEED, yellow flowers; terminal paniculiform inflorescence, pyramidal; flowers secund; stems and branches densely pubescent; leaves lanceolate, sessile; three linear leaf veins; forms large colonies, rhizomatous. "The short hairs of the leaves can give fresh plants a gray-green tone not seen in *S. canadensis* var. *canadensis."* (fna)
Comments: Potentially invasive. 6,394,366 to 10,088,888 seeds per pound. "A tall late flowering species that is common in moist places in fence-rows, thickets, etc." (Fell 1955) Mohlenbrock and Freckmann Herb. lump this with *S. canadensis*. FNA maintains this as a valid species with the primarily eastern subspecies *altissima*, 2n = 36, 54, and the primarily Great Plains subspecies *gilvocanescens*, 2n= 18, 36. This is the goldenrod that often has large insect galls on the mid to distal stems, unlike the similar *S. canadensis*.

Solidago caesia Linnaeus *WI BLUE-STEM GOLDENROD, aka Axillary Goldenrod, Woodland Goldenrod, Wreath Goldenrod (*caesius -a -um* blue-gray, light grayish blue, lavender blue, from Latin *caesius*, bluish gray, as in eyes, or dull, milky blue, lavender blue, or grey blue**.**)
Habitat: Wooded areas, rich woods, and sandy black oak savannas. Moist forested slopes. Tolerant of fine and medium textured soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 5.5-7.0.
Culture: Growth rate moderate. Seedling vigor medium. Vegetative spread rate slow.
Description: Medium tall, 2-4'; yellow flowers with bluish stems; inflorescence axillary racemiform; flowers not secund; stem and branch surfaces glabrate, glaucous; leaves narrowly lanceolate; one feathered leaf vein; clump-form from caudex. 8" minimum root depth. 2n = 18. "Plant is easily recognized by glaucous stem with waxy bloom." (ilpin)
Comments: Blooms 8-10. 700,000 to 8,750,000 seeds per pound. Limited seed availability.

Solidago canadensis Linnaeus CANADA GOLDENROD, aka Common Goldenrod, Goldenrod, Tall Goldenrod (*canadensis -is -e* of or from Canada or the north-east USA)
Habitat: Moist to dryish thickets, roadsides, clearings, and slopes. Open disturbed habitats. Mesic prairies, roadsides, open fields. Not particular about soil, likes a little extra water (pots 2000). Tolerant of coarse, medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 4.8-7.5.
Culture: Spreads rapidly, binds soil, easy from stratified seed or transplants. Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid.
Description: Tall WEED, perennial, 1-4', with golden yellow terminal paniculiform flower clusters, pyramidal; flowers secund; stems and branches glabrate below, pubescent above; leaves narrowly lanceolate, sessile; three linear leaf veins; colonial, rhizomatous. 12" minimum root depth.
Comments: Considered invasive in some parts of the country. 2,250,000 to 4,600,000 seeds per pound
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, and Hemiptera. Minor food value to upland birds and large and small mammals.

Solidago flexicaulis Linnaeus ZIG ZAG GOLDENROD aka Broad-Leaved Goldenrod, *verge d'or à tige zigzaguante* (*flexicaulis* pliant-stemmed, with a flexuous stem, with a bent stalk, from *flexus*, bent.**)**
Habitat: Wooded areas. Mesic savanna, mesic woodland, rich woods, thickets, and cool slopes, limey soils, shades calcareous springy places, shallow soils over dolomite or limestone.
Culture: Cold moist stratify for 60 days & sow in cool soil, small seeds need light. (Wade) "Cold moist treatment or fall sow, light cover, very good germination. (Dunham 1993) 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: Medium tall, 1.0-1.5'; yellow flowers; axillary racemiform inflorescence; flowers not secund; stems and branches glabrate below, pubescent above; lower leaves ovate, winged, petiolate, upper lanceolate; one feathered leaf vein; colonial, rhizomatous. 2n = 18, 36. "Species is easily recognized by green, non-glaucous stem and broadly ovate leaves abruptly contracted to a winged petiole." (ilpin)
Comments: Blooms 8-10. Ethnobotanical uses. Calcareous soils. Rhizomatous, can be somewhat aggressive in a wildflower garden. 1,344,000 to 1,392,638 seeds per pound. Very limited commercial availability.

"It has an angled zig-zag stem and serrated leaves that have winged petioles. It grows on wooded banks, ledges and outcrops and begins to flower early. In mesophytic situations, as the maple woods on Newburg road, it is more robust, more stoloniferous and begins to bloom later. (*S. flexicaulis* L.)" (Fell 1955)

Solidago gigantea Aiton LATE GOLDENROD, aka Giant Goldenrod, Smooth Goldenrod, *verge d'or géante*. (*giganteus* very large, giant, gigantic, unusually high, higher then the type. from Latin *giganteus -a -um*, of or belonging to giants.)
Habitat: Open disturbed habitats. Wet meadows, damp thickets, alluvial or rich soil, moist ground, common throughout Illinois. Moist to saturated soils. Nutrient load tolerance moderate to high, siltation tolerance moderate. Tolerant of medium and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 4.0-8.0.

Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify 60 days, small seeds need light. Cool soils; seed germinates quickly. Growth rate moderate. Seedling vigor high. Vegetative spread rate none?. USDA (1997) says in mixes plant 0.125 pls lb per acre, but due to the aggressive nature of this species, and the very high seed count this is excessive. Division of mature clumps.
Description: Tall, weedy perennial herb, 3.0-6.0' (8); yellow flowers; terminal paniculiform inflorescence, pyramidal; flowers secund; stems and branches glabrous and glaucous; leaves lanceolate, sessile; three linear leaf veins; forms large colonies, rhizomatous. 16-inch minimum root depth. 2n = 18, 36, 54. "similar to *S. canadensis* but stems have no real hairs and the bracts greener." (Freck.)
Comments: Blooms 7-10. Ethnobotanical uses. Useful in wetland restoration, used in upper shoreline zones, streambank stabilization, and vegetated swales. Can be aggressive and form monocultures. Hexaploid in prairies. 5,279,069 to 6,305,555 seeds per pound.

"A common tall goldenrod which has a long flowering period beginning earlier than the above (*S. altissima*)." (Fell 1955)

Associates: Provides nectar for butterflies. Provides cover for small mammals and songbirds.

Solidago graminifolia (Linnaeus) Salisb. [new nomenclature *Euthamia graminifolia* (Linnaeus) Nuttall.] GRASS-LEAVED GOLDENROD, aka Common Goldentop, Flat-Top Goldentop, Fragrant Goldenrod, Lance-leaved Goldenrod, Short Bushy Goldenrod From Hell, *verge d'or à feuilles de graminées*. To ease the postpartum depression of the separation of this genus from *Solidago*, USDA calls this plant GOLDENTOP. (*graminifolius -a -um* with grass-like leaves, from Latin *gramen, gramineus*, grassy, of grass, or of cane or bamboo, *-i-,* and *folius, folium*, a leaf.)
Habitat: Open disturbed habitats, often in weedy situations. Wet meadows, mesic prairies, dry prairies, damp to dryish shores, thickets, etc. Acidic to calcareous soils.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify 60 days, small seeds need light. Division of mature clumps, stem cuttings.
Description: Medium tall, 1.5-3.0'; yellow flowers; inflorescence terminal corymbiform, flat-topped; flowers not secund; stem and branch surfaces glabrate, pubescent; leaves linear; three linear leaf veins; colony forming rhizomatous. 2n = 18. "Leaves 3-5 nerved; not resinous or conspicuously glandular punctate." (ilpin)
Comments: Blooms 7-10. Aggressively rhizomatous. 7,895,652 to 13,159,420 seeds per pound.

"*S. hirtella* (Greene) Bush. With us a well marked species. It differs from *S. media* in being less common, later in flowering, growing in wetter places and it is a larger plant which is more branched and has wider leaves. (*S. remota* (Greene) Friesner, *S. graminifolia* var. *remota* (Greene) Harris.)" (Fell 1955)

Associates: Provides food and cover for wildlife. Ethnobotanical uses.

gymnospermoides	*graminifolia*
15-19 ray+disk florets	20-35 ray+disk florets
stems always hairless	line of hairs on stem
slender leaves, single vein	3 prominent veins
shorter and bushier	tall and slender

The similar *E. tenuifolia* of sand prairies near Lake Michigan more slender leaves, flower heads not in sessile clusters, but on individual pedicels.

Solidago gymnospermoides (Greene) Fernald [new nomenclature *Euthamia gymnospermoides* Greene] GRASSLEAF GOLDENROD, Great Plains Flat-topped Goldenrod, Great Plains Goldentop, Plains Grass-leaved Goldenrod, Texas Goldentop, Viscid Grass-leaved Goldenrod (*gymnospermoides* like a naked seed, from Greek *gymnos*, naked, *sperma*, seed, and *-oides,* resembling.)
Habitat: Sunny shores, dry to moist sandy soil.
Description: general form Erect perennial forb (or subshrub) mostly hairless except for rough leaf edges roots branched creeping rhizome culms 16-40" leaves thick, firm, linear, 1/8" wide, with 1 vein and obvious, glandular dots flowers heads with 10-14 (9-13, 16) short, yellow rays, inflorescence flat-topped to slightly rounded clusters of mostly stalkless heads, fruit dry achene with fluffy pappus N 2n = 36, 54 key features "Flower heads almost stalkless, leaves 1/8" wide, with 1 vein." (Freck.) "Leaves mostly 1-nerved, usually resinous and conspicuously glandular punctate." (ilpin)
Comments: Blooms August to September.

"*S. media* (Greene) Bush. Rather common on high prairies, railroads and in sandy places. It grows in patches and is seldom over 2 feet tall. The ways that if (sic) differs from *S. hirtella* are given above. *S. graminifolia* var. *media* (Greene) Harris." (Fell 1955)

Associates: Pollen possibly allergenic. Attracts wasps, flies, beetles, bees, butterflies.

Solidago juncea Aiton EARLY GOLDENROD, aka Goldenrod, Plume Goldenrod, Sharp-toothed Goldenrod, *verge d'or junciforme,* Yellow Top (*junceus -a -um* from Latin *iunceus*, made of rushes, juncus-like, like a rush; stiff.) upl

Habitat: Open disturbed habitats. Mesic to slightly dry black soil prairies, sand and gravel prairies; dry oak savanna, open areas of rocky upland woods, thickets, old fields, and sunny waste ground, where it is the earliest goldenrod to bloom. (Hilty 2002-2008). "Dry; prairies, woods, inland sands; in sandy, loamy soil" (Freck.) Open sandy soils and disturbed areas, fields" (fna).
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09) (Code C, G Ken Schaal) Cold moist stratify 60 days, small seeds need light. Easy by stratified seed or transplants, division of mature clumps.
Description: Medium to tall,1.0-2.5'; from a short caudex, occasionally slim horizontal rhizomes or stolons in sandy soils; yellow flowers 4-12 ray florets; terminal paniculiform inflorescence, not pyramidal; flowers secund; stems and branches glabrous; leaves lanceolate, sessile; one linear leaf nerve; clump forming from caudex. 2n = 18.

Solidago juncea is the only goldenrod in Illinois with a near or complete absence of hairs on the stems and leaves, presence of winged leaflets above the leaf axils, and an inflorescence that flares outward not upward (Hilty 2002-2008).
Comments: Blooms 6-8, the first goldenrod of the season to bloom. Cut flowers, ethnobotanical uses landscaping, soil binding. Spreads rapidly from rhizomes or vegetative offshoots, aggressive in small plantings. 2,250,000 to 4,989,010 seeds per pound.

"Our common early goldenrod which grows mostly in prairie situations." (Fell 1955)
Associates: Flowers attract long-tongued bees, short tongued bees, wasps, flies, butterflies, moths and beetles. Larval host for many moth species. Provides cover for *Cirrhophanus triangulifer* (Goldenrod Stowaway Moth). Greater Prairie Chicken, deer, groundhog and cottontail rabbit, and livestock may eat the foliage. Seeds may be eaten by Eastern Goldfinch, Tree Sparrow, and Swamp Sparrow.

Solidago missouriensis Nutt. *MI MISSOURI GOLDENROD, aka Prairie Goldenrod (*missouriensis -is -e* of or from Missouri or the Missouri River.)
Habitat: Dry prairies, gravels, and rocky slopes. distribution Has expanded its range eastward along railroads.
Culture: Cold moist stratify 60 days. Easy from stratified seed or transplants (Code C, G Ken Schaal).
Description: Perennial from cord-like rhizomes, sometimes clump from a caudex, 0.5-3.5', leaves with 3 obvious nerves (2 parallel to midvein) stem leaves diminishing in size upward. 2n = 18, 36. Diploid in the prairies key features Distinguished by plant mostly hairless, 3-nerved proximal leaves, upper leaves mostly smaller, and the usual thin, elongate rhizomes.
Comments: Blooms 7-8. C3. Soil binding, spreads rapidly. 5,6000,000 to 6,013, 245 seeds per pound. May be very similar to *S. juncea* and hard to distinguish.

"*Solidago glaberrima* Martens. A common early prairie goldenrod. Being markedly stoloniferous it tends to form large patches. (*S. missouriensis* var. *fasciculata* Holzinger)" (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Coleoptera, and Hemiptera. Listed as edible to humans but a minor livestock poison. Salad anyone?

Solidago nemoralis Aiton OLD-FIELD GOLDENROD, aka Dyer's-weed Goldenrod, Dwarf Goldenrod, Field Goldenrod, Gray Goldenrod, Gray-stemmed Goldenrod, *verge d'or des bois* (*nemoralis -is -e* of or growing in woods or groves, sylvan, from Latin *nemoralis*, adjective, of or in a wood or grove. Nemoral, pertaining to or living in a forest or wood.)
Habitat: Open, often somewhat disturbed habitats. Mesic, dry, hill, and sand prairies, dry-mesic and dry savanna, open woods and old fields. Tolerant of coarse and medium textured soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade intolerant. pH 6.5-7.5.
Culture: Cold moist stratify 60 days, small seeds need light. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cool soils, successional restoration, dry stratified seed. Growth rate rapid. Seedling vigor high. Vegetative spread rate none. Easy by division.
Description: Short, 1.5-2.5'; from a branching caudex and rhizomes, terminal paniculiform inflorescence, narrowly pyramidal; flowers yellow, secund; stem and branch surfaces finely pubescent, puberulent; lower leaves oblanceolate, winged, petioled, upper elliptical, sessile; one feathered leaf vein; clump-form from caudex key features Plants are gray-green, flower clusters often arch downward, flowers secund (Freck.) .
Comments: May be a weed of economic impact in some western states. Blooms 8-11. Cut flowers, landscaping. Grows well in dry sterile soils. 1,835,579 to 4,800,000 seeds per pound.

"Common in such dry places as high prairies, gravel hills, and sand areas. It is quite variable. It has a long flowering period which at times begins as early as late July and lasts until November." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, and Hemiptera. Minor food value to large and small mammals and upland birds.

Solidago ohioensis Riddell *WI OHIO GOLDENROD (*ohioensis* of or pertaining to Ohio.)
Habitat: Wet meadows, fens, moist ground. Marshes, wet sand dunes. distribution ne Illinois, se Wisconsin.

Culture: Cold moist stratify 30 days, small seeds need light. "Dry cold store only, may be fall sown, or cold moist treated. Light cover. Good germination." (Dunham 1993). 30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09) "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd)
Description: 3.0-5.0'. 2n = 18. "*Solidago ohioensis* is most likely to be confused with *S. riddellii,* which has folded and multinerved leaves, and *S. houghtonii*, which has arrays with few large heads" (fna). The latter is a rare Great Lakes coastal species from Ontario, Michigan, and New York.
Comments: Blooms 7,8,9,10. Calcareous. 1,440,000 to 2,172,249 seeds per pound.

Solidago patula Muhlenberg ex Willdenow *IA SWAMP GOLDENROD, aka Rough-leaved Goldenrod, Round-leaf Goldenrod, Spreading Goldenrod (From Latin *patulus -a -um* wide open, gaping, wide-spreading.)
Habitat: Fens, wet ground, and riparian prairies. Tolerant of coarse, medium, and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 4.5-7.0.
Culture: "Cold moist treatment or fall sow, light cover, fair germination." (Dunham 1993). Cold moist stratify 60 days, small seeds need light. Cool soils. Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.
Description: 3.0-5.0', attractive yellow flowers, 6-inch minimum root depth. "*Solidago patula* is readily recognized by the angled stem and the sharkskin-like texture of the adaxial surface of the leaves." (fna)
Comments: Blooms 8-10. Wetland restoration, calcareous, self sows. Butterfly nectar source. 700,000 to 1,150,000 seeds per pound.

Solidago ptarmicoides (Nees) B. Boivin PRAIRIE GOLDENROD, aka Upland White Goldenrod, White Prairie Goldenrod See *Aster ptarmicoides.*

Solidago riddellii Frank (or Frank ex Riddell) *AR RIDDELL'S GOLDENROD (*riddellii* for John Leonard *Riddell*, 1807-1865.)
Habitat: Wet meadows, fens, seeps, moist ground, wet to mesic prairies, calcareous. distribution: central United States
Culture: Easy from seed, cool soils. Cold moist stratify 60 days, small seeds need light. "Cold moist treatment or fall sow. Will germinate with dry cold storage. Prefers cooler soils, sow in early spring or late fall. light cover. Very good to excellent germination." (Dunham 1993). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09) "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Self sows. Division of mature clumps.
Description: Erect perennial, 1.5'-3.5' tall forb; stems usually thick and mostly smooth flower head yellow, 7-9 rays; inflorescence a crowded flat-topped cluster often with up to 100 heads. Fruit mostly smooth, dry achene, with fluffy pappus. Leaf sickle-shaped, smooth, with no teeth, often folded along midrib, stalked, upper leaves becoming stalkless to sheathing but not much smaller. Plants slowly expand by short rhizomes. 2n = 18.
Comments: Blooms 8-10. Pollinated by bees and flies. Butterfly nectar source. Cut flowers, landscaping, wetland restoration, calcareous. Lives 2-3 years in fields in mesic soils, but is known from mesic remnants. 1,170,103 to 2,686,391 seeds per pound.

"A late goldenrod that grows on low prairies. It is quite uncommon in such places as Searle Tract. It is also found in Boone and De Kalb counties." (Fell 1955)

Solidago rigida Linnaeus *CT, MD, NJ, NY, PA, RH RIGID GOLDENROD, aka Bold Goldenrod, Hard-leaved Goldenrod, Prairie Goldenrod, Stiff Goldenrod, Stiff-leaf Goldenrod (From Latin *rigidus*, adjective, stiff, hard, stern, rough.)
Habitat: Mesic, dry, hill, and degraded prairies, also dry savannas. Prairie soils, dry open places (esp. sandy soils), open woods, thickets. Moderate water requirement, full sun. Coarse to moderately fine soils. Neutral to acidic soils. Dry to mesic soils, minimal flooding tolerance. Nutrient load low to moderate, siltation tolerance low. Tolerant of coarse and medium textured soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement medium. Salinity tolerance none or low. Shade tolerance intermediate. pH 5.0-7.5.
Culture: Easy from seed. Cold moist stratify 60 days or fall sow. Will germinate with dry cold storage. "Prefers cooler soils, sow in early spring or late fall. Light cover. Very good to excellent germination. *S. rigida* may self sow. (Dunham 1993). 60 days cold moist stratification (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Direct seed on bare soil in fall for best germination and coverage (USDA 1997). Pure stand plant 2 lb per acre (granite). In mixes, plant 0.06 to 0.3 pls lbs per acre (USDA 1997). Growth rate rapid. Seedling vigor medium. Vegetative spread rate moderate. Division of mature plants. Widely available as seed, bare root and potted material.
Description: Native perennial herb, 2.0-4.0(6)', with golden yellow flowers in flat-topped clusters on tall hairy stems. 12" minimum root depth.

Comments: Blooms 7-10. Plants are largely cross-pollinated. Good cut flower, ethnobotanical uses, landscaping.

Too aggressive for small sites, self sows, can be invasive in moist sites or in overgrazed pastures. Judging from the lack of weeds in our fields, *S. rigida* is allelopathic. A tremendous seed producer, there is a noticeable lack of seedlings near the mother plants, maybe exhibiting some type of autotoxicity. The field rows show absolutely no other plants! An area where we plugged this species into one of our hillsides in 1994, was showing by 1998, greatly reduced growth of *Bromus inermis*, compared to the areas immediately adjacent to the *S. rigida* planting. 506,132 to 806,394 seeds per pound.

"A stiffly erect, late flowering goldenrod usually found in dry places, such as high prairies, roadsides and railroads." (Fell 1955)

Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, and Coleoptera. Provides cover and food for songbirds. Attracts insects, butterflies.

Solidago rugosa P. Miller (or Aiton) ROUGH GOLDENROD, aka Bitterweed, Early Wrinkle-leaf Goldenrod, Rough-stemmed Goldenrod, Tall Hairy Goldenrod, Wrinkleleaf Goldenrod, *verge d'or rugueuse* (*rugosus -a -um* rugose, wrinkled, rough; covered with wrinkles, or thrown into wrinkles, from Latin *rugosus*, full of wrinkles, folds, or creases, from *ruga*, wrinkle.)

Habitat: Open disturbed habitats. Found in thickets surrounding marshes and in dunes where the soil is sandy or peaty, in bogs, and in sterile acidic habitats. Acidic gravelly seeps. It is also known from shallow soils over sandstone. Tolerant of coarse and medium textured soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance medium. pH 5.0-7.5. distribution Introduced in Wisconsin and northern Illinois! Native in sw Illinois. ***This is not native in northern ½ of Illinois and should not be planted.***

Culture: Seed from Maine was said to need no treatment, but also said viability is low (results self-reinforcing and inconclusive perhaps?); store dry seed at 40ºF (van der Grinten 2001). Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid. Spreads slowly by seed.

Description: Tall ***weedy*** perennial (emphasis added), to 3.3'; rhizomes long creeping; yellow flowers; terminal paniculiform inflorescence, widely branched or divergent; flowers secund; stem and branch surfaces densely pubescent, coarse; leaves ovate, sessile; one feathered leaf vein; forms large colonies, rhizomatous. 12-inch minimum root depth. 2n = 18, 36, 54.

Comments: Blooms 8-10. 1,000,000 to 1,480,000 seeds per pound. The use of this species in restoration in Chicago is a blatant example of the total lack of biogeographical integrity (or knowledge, insite, ethics, and so on) of many native plant nurseries. Dufuses (doofi?) want local ecotype, they preach the importance of EPA regional ecotypes, but they will plant anything beyond its range.

Solidago sciaphila E.S. Steele *IL, WI CLIFF GOLDENROD, aka Driftless Area Goldenrod, Shadowy Goldenrod (*sciaphilus -a -um* shade loving, from Greek *skia* shadow, *scia* for umbrella, Sanskrit *chāyā* color, shadow, and *phelein,* to love.)

Habitat: Sandstone, limestone, or dolomite bluffs, ledges, and cliffs, mostly near the Mississippi River, in Illinois, Iowa, Minnesota, and Wisconsin. Shaded or exposed dolomite cliffs. Also on the Illinois and Rock rivers.

Culture: Cold moist stratify 60 days, small seeds need light (pm 09).

Description: From a branched, thick woody caudex. 2n = 36. Inflorescence is a thyrse. This species differs from *S. speciosa* by having proximal leaves obviously serrate.

Comments: Blooms August-September. C3. 1,280,000 seeds per pound.

Solidago sempervirens Linnaeus SEASIDE GOLDENROD, aka *verge d'or toujours verte* (*sempervirens* evergreen, retaining leaves in winter.)

Habitat: Saline open disturbed habitats. Originally a coastal species but introduced in Illinois, Michigan, Ohio, and Ontario.

Culture: Rude and uncultured. Why?

Description: Tall, 3 feet or more; flowers yellow; terminal paniculiform inflorescence, pyramidal; flowers secund; stem and branch surfaces glabrous; leaves lanceolate, subclasping; one feathered leaf vein; clump-form from caudex. 2n = 18.

Comments: Blooms August to September. This is an interesting plant that lends color to the saline roadsides in metro Chicago. We had hoped to include it in a salt mix, but it seems to be leaving the salt zone for the cloverleaf infields and will be a new invasive. For years, it was on I-80 in the south side, then crept to the DuPage River, and in 2005 isolated plants are between I-39 and State Route 351, on I-80 near LaSalle. Westward Ho! 2007 heading south on Rt. 251. 2008, Bettendorf, Iowa. 2009 firmly established at I-80 and 251. Coming soon to a roadside near you.

Associates: Insect pollinated, pollen yields are generous, and pollen may be allergenic (ilpin).

Solidago speciosa Nutt. *MD ☠ SHOWY GOLDENROD, aka Noble Goldenrod (From Latin *speciosus*, beautiful, handsome, good-looking; attractive, appealing; presentable; spectacular, brilliant, impressive)
Habitat: Open habitats. Hill, sand, dry, and mesic prairies and sand savannas, and open woods. Prairie soils, dry open places, sandy soils, thickets, open woods. Inland sands and loamy sands.
Culture: Our seed testing confirms most lots require or benefit from cold moist stratification. Prairie Moon recommends 60 days cold moist stratification and light. "Cold moist treatment or fall sow. Will germinate with dry cold storage. Prefers cooler soils, sow in early spring or late fall. Light cover. Very good to excellent germination." (Dunham 1993). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) "30 days moist stratification required for germination. Field sow fall." (pn nd) Cool soils. Division of mature clumps. Showy Goldenrod will self-sow in open, sandy soils.
Description: Tall, 1.5-3.0'; flowers yellow; terminal paniculiform inflorescence, branches racemiform; flowers not secund; stem and branch surfaces glabrate below, pubescent above; leaves lanceolate, sessile; one feathered leaf vein, clump-form from stout woody caudex key features Stems often reddish, phyllaries slightly sticky, inflorescence coarsely hairy, leaf not hairy. (Freck.) "Handsome when in flower, long spires of yellow flowers and pale green foliage." (ilpin)
Comments: Blooms 7-10. Cut flowers, ethnobotanical uses landscaping, can become aggressive. 989,106 to 2,408,488 seeds per pound. On poor, dry soils, *S. speciosa* maintains a nice tight conical candelabra-shaped inflorescence. If planted on average to good soils, it looks like the butt-ugly weedy species.

"A common late flowering goldenrod, perhaps our most attractive, growing in open woods, sandy places, on prairies and railroads. We were unable to find it in suitable places in Stephenson but it grows in the other neighboring counties. The var. *rigidiuscula* T. & G. is less common, is rather later in flowering and while growing in the same places as the species, it keeps to its own patches." (Fell 1955)

Associates: Pollinated by long-tongued bees, other Hymenoptera, Lepidoptera. Said to provide food for terrestrial and aquatic furbearers, but have you ever seen a muskrat in a sandy hill prairie? Provides food for deer, upland game, songbirds, and small mammals.

Composites are an alternate host for *Coleosporium* Pine Needle Rust. Cattle and horses ingesting plants infected with *Coleosporium* spp. fungi may become ill and die. *Solidago speciosa* and other *Solidago* spp. may have a component that causes hemolytic anemia.

Solidago uliginosa Nutt. NORTHERN BOG GOLDENROD, aka Goldenrod, *verge d'or des marais*. (*uliginosus -a -um* of wet or marshy places, growing in wet places, from Latin *uliginosus*, full of moisture, wet, moist, damp, marshy, from *uligin-, uligo* moisture, marshiness, from *udus, uvidus* damp, moist.)
Habitat: Swamps, bogs, and marshes. Acidic or calcareous bogs.
Description: From a long branched caudex. 2n = 18, 36.
Comments: Blooms 8,9. Bog Goldenrod is highly variable in stem height and the size of the flower cluster, which are greatly influenced by growing conditions. Plants from the center of a bog are more slender than plants from the edge of a bog. (fna, ilpin) "Species has more slender plants from bog center treated by some authors as *S. uniligulata,* and the more robust plants from bog edge as *S. neglecta*." (ilpin) "Uncommon in boggy places in Coon Creek bottom and rare in Kishwaukee River bottom below Cherry Valley. We have seen it in a small prairie bog near Irene in Boone County. Its flowering time is rather early." (Fell 1955)

Solidago ulmifolia Muhlenberg ex Willdenow ELM-LEAVED GOLDENROD upl (*ulmifolius -a -um* elm-shaped leaves, *Ulmus*-leaved.)
Habitat: Dry savanna and woodlands, limestone glades. Moderately disturbed woodlands. In the se USA, it grows in rocky forests and woodlands, especially on mafic and calcareous substrates (Weakley 2008).
Culture: "Cold moist treatment, or fall sow. Light cover. Very good germination." (Dunham 1993) Cold moist stratify 30 days [60 days pm2009], small seeds need light (Wade nd). Genesis seed teste confirm the need for cold moist stratification.
Description: 2.0-3.0'. From a branching caudex. 2n = 18.
Comments: Blooms 8-11. 2,080,000 to 3,185,965 seeds per pound. "Common, mostly in the edge of woods. The long arching racemes are attractively conspicuous from midseason until late fall." (Fell 1955)

SYMPHYOTRICHUM Nees 1833 **American Aster** *Symphyotrichum* from Greek *symphysis*, junction, and *trichos*, hair, referring to a perceived basal connation of bristles in the European cultivar used by Nees as the type. A genus of about 90 species of the Americas and east Asia. See *Aster.*

VERBESINA Linnaeus 1753 **Crownbeard, Wingstem, Frostweed** New Latin, modification (influenced by *Verbena*) of Italian dialect *forbesina Verbesina*. In the broad sense, a genus of about 200-300 species of trees, shrubs, and herbs, of tropical subtropical, and warm temperate America.

Verbesina helianthoides Michaux YELLOW CROWNBEARD, aka Gravel Weed, Ozark Crownbeard, Yellow Ironweed (*helianthoides* like or resembling *Helianthus*, Sunflower.)
Habitat: Open woods and prairies, railroads. distribution common in the s. 3/5 of Illinois, absent elsewhere in the state.
Culture: Cold moist stratify 60 days (Ken Schaal) 60 days cold moist stratification (pm 09).
Comments: Blooms July-August. Hardy in Whiteside County.

VERNONIA Schreber 1791 **Ironweed** New Latin, from William *Vernon* died 1711 English botanist who collected in Maryland and New Latin *–ia.* 20± species of perennial herbs, mainly in central and eastern North America, 2-3 species in Mexico. Almost every North American species is known to hybridize with another species. Roots of upland species are eaten by small mammals in winter. Fruits are achenes with tufts of hair. As Jerry Wilhelm once said, "No one really understands *Vernonia* in Illinois". x = 17

The seeds ripen in the fall when the pappus dries and fluffs out. Seeds require cold moist stratification. Germination is easy, growth rapid, plants often blooming 1st season. 5-7 node softwood cuttings root well, but may not overwinter well. (Cullina 2000) Seeds are subject to predation.

Vernonia altissima Nutt. NY* TALL IRONWEED, aka Giant Ironweed It is politically correct to call this *Vernonia gigantea* (Walter) Trelease ssp. *gigantea* (*altissimus -a -um* highest, very high, very tall, tallest, superlative of *altus*, and *–issimus*, superlative suffix; most so, to the greatest degree; most-, -est, such as largest, prettiest, whitest.)
Habitat: Low woods and open ground. Valleys, meadows, open grounds, borders of swamps. Mohlenbrock says it is common throughout Illinois, including the var. *taeniotricha* Blake.
Description: Tall, 3-6 feet; Disk flowers reddish purple. Pappus usually purplish, sometimes stramineous. 2n = 34.
Culture: Cold moist stratify 60 days (pm 09)
Comments: This species is considered invasive in some parts of its range by some authorities. It may be a weed of economic consequence in some areas. Blooms 7-9. 384,000 to 670,276 seeds per pound. "We have not found this ironweed in Winnebago County though it seems common in De Kalb County a few miles southeast of us near Kirkland. The inflorescence is spreading and the lower leaf surface pubescent and not pitted." (Fell 1955)

Vernonia fasciculata Michaux COMMON IRONWEED, Ironplant, Prairie Ironweed, Smooth Ironweed, Western Ironweed (*fasciculatus, -a -um* Latin *fasciculatus*, fascicled, clustered, in close clusters or bundles, banded, in bundles, from *fasiculus*, bundle, packet, and *–atus*, possessive of or likeness of something.)
Habitat: Moist to mesic prairies and open floodplains, low open woods and river bottom prairies. Wet prairie, sedge meadow, and shallow marsh. Tolerant of flooding of 2-3" early in growing season. pH 5.6-7. Nutrient load tolerance low to moderate, salt tolerance not available, siltation tolerance moderate. Full sun.
Culture: Cold moist stratify 60 days (pm 09). Easily grown from cold-stratified seed, easily established. Some say that germination is enhanced by sowing cold moist stratified seed in green house in June when soil temperatures are high, giving rapid germination and rapid seedling growth (USDA 1997), but greenhouses in June are too hot, so reconsider. Debearded seed. Bump seedlings when they are large enough to handle.

4-6" stem cuttings in June or July, rooted in 50/50 mix of peat moss and sand (or gel mix). Cuttings should be rooted in 4-5 weeks and repotted if necessary. Move rooted cuttings to permanent location, or overwinter in cold frame (USDA 1997).

In the past, there were complaints that some seed lots had low viability. Most debearded seed is standard, with higher percentages of viable seed. Seed availability may vary from year to year due to insect pests. In mixes, plant 0.06 to 0.188 pls lbs per acre (USDA 1997).
Description: Perennial herb, up to 6', with purple flowers 3.0-6.0'. Lower leaf surfaces hairless and pitted. Pappus fuscous to purplish. 2n = 34.
Comments: Blooms 7-9. C3. Cut flowers, landscaping. Moderately stoloniferous (????) making species useful in upper shoreline erosion control. Aggressive, unpalatable to livestock, increases under grazing. 473,904 to 852,582 seeds per pound. "This is our only species and it is common only occasionally and then in low meadows or bottomland pastures. There is but little variation in the bracts, shape of the inflorescence, shape and serration of the leaves, but there is some difference in the amount of pitting, and, in Sugar River sand area the lower surface of the leaves is somewhat pubescent." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera. Attracts butterflies, good nectar source.

Vernonia missurica Rafinesque *OH MISSOURI IRONWEED (*missuricus -a -um* of or from Missouri or the Missouri River.)
Habitat: Dry prairies, dry savannas, occasionally in floodplains. Tolerant of coarse, medium, and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 5.0-7.0.
Culture: Fall plant or cold moist stratify 60 days (pm 09). Growth rate moderate. Seedling vigor low. Vegetative spread rate none. Spreads slowly from seed. Cuttings

Description: Purple flowers, occasionally rose or white 3.0-4.0'. Pappus stramineous to whitish. Minimum root depth 8". 2n = 34.
Comments: Blooms 7-9. Cut flowers. 406,082 to 685,801 seeds per pound.
Associates: Attracts butterflies.

CONVOLVULACEAE A. L. Jussieu 1789 **Morning Glory Family**

IPOMOEA Linnaeus 1753 **Morning Glory, Sweet Potato** *Convolvulaceae* Greek *ips* worm and *homoios* resembling. Tender annual and perennial climbers. *I. batatas* is the commercial sweet potato. The seeds of *I. violacea* Linnaeus are used in hallucinogenic ceremonies among the Zapotecs, containing d-lysergic acid amine, d-isolysergic acid amine, and chanoclavine (Uphof, 1968).

Ipomoea pandurata (Linnaeus) G.F.W. Meyer WILD SWEET POTATO, aka Man Of The Earth, Man Root. (*panduratus* Latin fiddle-shaped)
Habitat: Moderately drained to well drained areas in floodplains, such as the Spoon, Rock, or Illinois rivers. It may persist at the edge of ag fields.
Culture: Steep seed, fall plant.
Description/comments: White flowers Blooms 7,8. Landscaping, herbaceous vine. 8,928 seeds per pound.

CORNACEAE Linnaeus 1753 **Dogwood, Cornel** A family of 2 genera and about 80 species of trees, shrubs, lianas, and subshrubs, semicosmopolitan (not semi-Vogue).

CORNUS *Cornaceae* From the Latin name for *Cornus mas.* Herb, deciduous shrubs and trees.
Fresh seed and fall plant / macerate and cold moist stratify-alternating temperatures-double dormant.

Cornus amomum (*obliqua*), *C. foemina* (*racemosa*), and *C. stolonifera*.

Dogwood fruits ripen in the late summer and early fall. The stones may be sown uncleaned, but stored seed may be dried berries or cleaned stones. Cleaned, air-dried stones are stored in sealed containers at 3–5º c. Germination takes place the first or second spring after fall sowing. Hard seed coats and dormant embryos are present in most Cornus species, requiring warm moist stratification for 60 days followed by Cold moist stratification for >60 days. Best nursery results are from fall sowing of freshly harvested seed. Late harvested seed should be stored, cold moist stratified until the following season, and fall sown. Mulch is recommended. Acid scarification and gibberellin may help. Specific techniques are :

C. amomum: light 8 hr./day, warm moist stratification 8 - 12 weeks at 25º C., then cold moist stratification 8 - 12 weeks at 1 -5º C., incubate at 20/30º C.; or cold moist stratification 21 days at 3 -5º C.

C. stolonifera: cold moist stratification at 3-5º for 90 days; or cold moist stratification 120-160 days. (Young & Young 1992; AOSA 1985; Genebank handbook 1985; Dirr & Heusser 1987).

C. stolonifera: fall plant or 60 to 90 days cold moist stratification. (Dirr & Heusser 1987)

C. amomum germinates best in outdoor treatment with fresh and dry stored seed. Germination in March and April from September planting. This species has seeds that float and sink in water. Both types germinate at approximately 30%. Alternating cycles germinate 0 - 5%. *C. foemina* germinates low in the laboratory alternating cycles, with germination continuing through third cycle. *C. stolonifera* ripens seed in both July and October. Early and late seed have similar germination. Laboratory experience 40º sown fresh seed and dry stored seed gave germination extended over 6 cycles. Outdoor treatment may give better results. (Deno 1991)

Cornus canadensis Linnaeus BUNCHBERRY, aka Bunchbery Dogwood, Dwarf Cornel (of Canada or northeast USA.)
Habitat: Woods thickets, and damp openings, cool woods and moist clearings, medium moisture requirement, full sun to partial shade, acidic woodlands, moderately coarse to moderately fine soils, Neutral to acidic soils
Culture: Seeds mature late summer. Macerate and sow seeds in a cold frame for outdoor treatment. Code B, G. (Cullina 2000)
Description: Herbaceous ground cover member of the genus, may produce dense carpets, <1'' white petal-like bracts similar to *C. florida*, blooming May to July, spring to summer, followed by bright red berries late summer early fall. May form dense ground cover. Zone 2. 67,000 (Granite) seeds per pound
Associates: Self-incompatable. Pollinated by large insects such as bumblebees and possible partially by wind. The flowers are "spring-loaded" and rapidly open when triggered by a heavy insect. As the petals separate, the stamens spring out with an acceleration of 24,000 meters per second per second. The flowers are not triggered by lighter species such as ants, but may open on their own. The explosive release of the stamens propels the pollen up to 22 cm (in calm air), which effectively coats any insect visitors, and/or may allow wind pollination. (Edwards etal 2005)

CRASSULACEAE DC. 1825 **Stonecrop Family**

Penthorum See *Penthoraceae*

SEDUM Linnaeus 1753 **Stonecrop, Orpine, Sedum** *Crassulaceae* Stonecrop Family A genus of approximately 200 species, which is sometimes split into 4 or 7 genera.

The small seeds ripen in summer to fall, 3-4 weeks after flowering. Collect when the seed heads are yellow to brown. Surface sow and stratify. Code A or B, H. Cuttings are by far easier than seed. Late flowering species should be stuck in spring, with spring flowering species stuck in summer. Leaf cutting cut at the stem also root in about one month. (Cullina 2000)

Sedum pulchellum Michaux WIDOW'S-CROSS
Habitat: In the SE USA, calcareous rock outcrops.
Culture: Cold moist stratify. (Ken Schaal)

Sedum ternatum Michaux WILD STONECROP, aka Mountain Stonecrop
Habitat: Limestone bluffs, rich floodplain terraces, "open woodland site.
Culture: Spreads by seed. A real no-brainer from cuttings.

CUCURBITACEAE A. L. de Jussieu 1789 **Gourd Family** A family of about 120 genera and 775 species, chiefly tropical and subtropical, with a few species extending into temperate areas.

ECHINOCYSTIS Torrey and A. Gray **Wild Cucumber** *Cucurbitaceae* A monotypic genus of eastern North America.

Echinocystis lobata (Michaux) Torr. & A. Gray WILD BALSAM APPLE, aka Wild Cucumber
Habitat: Habitat is limited only by perch selection of jays and other birds which open the fruits and eat the seeds, but typically found in wet or moist environments. Blue jays have been known to carry acorns and pine seeds up to 35 miles. "Common in thickets, fence-rows, and weed patches in moist places." (Fell 1955)
Culture: 60 days cold moist stratification (pm 09). Fall plant only (Deno).
White flowers. Blooms 7,8,9. Ethnobotanical uses, landscaping, wetland restoration, herbaceous vine, annual. Attracts song birds, can become an agricultural pest. 1,248 to 2,880 seeds per pound.

SICYOS Linnaeus *Cucurbitaceae* From the Greek name for the cucumber. A genus of about 50 species, Australia, Pacific Islands, and tropical America.

Sicyos angulatus Linnaeus # DE, IN, KY BUR CUCUMBER, aka Oneseed Burr Cucumber, Wall Bur Cucumber, Wild Cucumber
Habitat: Wet savannas-mesic woodlands, fencerows, wooded floodplains, moist soil of fields and woods. "Rock River and Kent Creek banks at the mouth of the latter and on the island at the I.C.R.R. bridge, in Rockford." (Fell 1955)
Culture: Hull, fall plant. Seeds germinate after a period of cold, moist stratification. (pm 09) Description: general form Herbaceous annual vine with branching tendrils leaves broad with 3-5 shallow lobes flowers white to greenish, corolla 5-lobed, 5-merous, inflorescence of male flowers in a long-stalked cluster (cyme-like raceme), the female flowers in a shorter-stalked, small, head-like cluster; fruit dry, not inflated, prickly, one seeded key features Large leaves, clusters of pistillate flowers, spiny clusters of fruits, fruits not inflated.
Comments: Noxious weed in Delaware, Indiana, and Kentucky. Blooms 8,9
Associates: Female flowers attract long-tongued bees (including honeybees and bumblebees), Sphecid wasps, Vespid wasps, and flies. Wasps and some bees are attracted to the male flowers. Attracts a large number of pests, including flea beetles, Cucumber beetles, Squash beetles, plant bugs, aphids, and moth larvae.

CYPERACEAE SEDGES, BIESIES Formally described in 1789 by De Jussieu. The family name is derived from the genus name *Cyperus,* from the Greek *kupeiros*, meaning sedge.

Many species are grass-like, being tufted, with long, thin, narrow leaves, jointed stems, and branched inflorescence of small flowers, and are horticulturally lumped with grasses as graminoids. Archer (2005) suggests the term graminoid be used for true grasses, and cyperoid be used for sedges.

There are approximately 104 genera, 4 subfamilies, 14 tribes, and about 5000 species worldwide, with 27 genera and 843 species in North America (Ball et al, 2002).

CAREX Linnaeus 1753 SEDGE, LAîCHE, SHEAR-GRASS *Carex,* Classical Latin name, possibly derived from Greek, *keirein*, 'to cut', from the sharp leaves and stems of many species, or possibly from the Proto-Indo-European root **kars*, scratch or rub. Sedge is from the Old English *secg*, of Germanic origin, from Indo-European root shared by

Latin *secare* 'to cut', similar to such words as Sicarii and Judas Iscariot, and dissect or bisect.

Carices are of great ecological importance, but outside ranching, restoration/erosion control, horticultural industries, and academia, they are of little direct economic value or interest. Sedges are the most important forage plants in many regions of the world. Caric sedges are important members of almost all temperate, arctic, and alpine natural communities, dominant or co-dominant in some communities. The indirect economic benefits of these natural areas are incalculable. Caries are key species in stream bank and shoreline stabilization, wetland mitigation, and natural area restoration.

Germination

Carex seed heads may mature and shatter while the perigynia are still green, or may persist until the yellow or brown. Seeds may be harvested from late May through October.

Many sedges that have had germination studies are characterized by 1) strict or conditional primary dormancy, 2) a light requirement for germination, 3) low germination at constant temperatures, 4) a positive response to diurnal temperature fluctuations, and 5) an induction of secondary dormancy in late spring by increasing environmental temperatures. (Schütz 2000) With Schütz's findings in mind, restorationists should not expect results for summer seedings or plantings that use cover crops.

It was at one time very common to see or hear that fresh seed is necessary when propagating all carices. That was a silly generalization for any group of plants, especially for such a large genus. Dried seed works well with almost every species that we have tried growing. A few sedges are non-dormant upon ripening, and may germinate the year they are formed, and some are conditionally dormant, but few have been noted as recalcitrant, including *Carex flava* and other ant dispersed species, the *Carex laxiflora* group, *C. plantaginae*, *C. pensylvanica. C. platyphylla*, *C. rosea*, *C. radiata* and the Appalachian endemic sedge *Cymophyllus fraseri* (also includes) (Cullina 2004b, 2008, Prairie Moon nd.). Several wetland species have been reported to decline in viability with dry storage. It may be necessary with some spring ripeners to sow them soon, to keep the seeds at ambient soil moisture levels. Known and suspected hydrophilic species should be dried for a week, cleaned and placed in air-tight containers under refrigeration until being sown. *(It is one of the few good rules of thumb in this industry to sow any spring ripening seed in the spring*.) Realistically, dormancy rather than freshness is the key issue in propagation. Our experience with TZ and germination tests indicate viability is not lost in drying, though many species are highly dormant and will benefit from 90 to 120± days cold moist stratification. Wm. (Bill) Cullina (2008) stratifies all carices he propagates for 90-120 days. (*Try cold moist stratifying some Carex seeds for 12-18 months, and they'll grow like dog hair.)* Many species germinate quite readily when fully developed, well-ripened, cold dry stratified seed is sown in a warm location in a green house. (*Many, but not all, Ovalian sedges produce good green house crops without pretreatments*). The seed must be in good contact with the soil to imbibe water, technically water vapor. Removing the perigynia of species where the achene does not fill the inflated perigynia, as in *C. grayi* or *C. intumescens*, is necessary to establish seed soil contact, plus dormancy mechanisms have been found in the perigynia of some species (*C. aquatilis, C. straminea*). Placing the seeds in cloth bags and leaching the seeds in running water for two days can also remove the growth inhibitors present in the perigynia.

Our data generated from seed testing (for seed sales) indicate many species, including *C. stipata,* are non-dormant, requiring no cold dry storage and can potentially germinate within weeks after ripening.

Caric sedges with achenes heavier than 0.9 mg are relatively highly dormant, for as seed size inceases, seed coat thickness increases, restricting germination (physical dormancy). There should be a relationship between seed count and dormancy levels, with dormancy decreasing as seed count increases. This relationship can be painfully obvious in the greenhouse when growing large-seeded sedges such as *C. grayii* or *C. tuckermannii,* or the hop sedges. This is also observed in the genus *Scirpus* (the old traditional genus, not the splitter's delight), with large seeded species dormant as door nails. Stratify early and stratify often. Hull it, Baby.

Carex were generally considered non-mycorrhizal, although some northern Illinois carices have been found with unusual mycorrhizal infections. In northeast Illinois, Miller et al. (1999) examined 151 individuals finding arbuscular fungi in 16 out of 23 species sampled. *(According to Miller, (personal communication) some carices may be mycorrhizal; they really don't seem to care one-way or the other.)* With data is from Muthukumar, et al (2003), of 76 Carex species and varieties recorded, 25 were mycorrhizal, 4 were facultatively mycorrhizal, and 47 were nonmycorrhizal. There are no commercial inoculants that work with Carex.

Carex have C3 carbon metabolism.

Carex alopecoidea Tuckerman BROWN-HEADED FOX SEDGE, aka Foxtail Sedge, Northern Fox Sedge (from the Greek *alopex*, fox, and *oides*, with the form of, resembling a fox's tail, αλωπεκουρο, αλωπεξουρα, from Theophrastus, fox tail, fox brush perhaps referring to *Polypogon monspeliensis*, from which the genus name *Alopecurus* is taken, and *οειδες*, *-oides*, like, resemble, from the brown inflorescence resembling a fox's tail.)

Habitat: Wet meadows, deciduous floodplain forests and adjacent meadows, uncommon sedge of wet open places. Wet, calcareous meadows and swales. Uncommon, in low woods and moist fields, and roadsides (gccr92). Wet

meadows, moist fields, low woods (rhm02). In New England, calcareous meadows, swales, alluvial woods, low thickets (afne). distribution Scattered in the n. 2/3 of Illinois; also Pope Co.
Culture: Cold moist stratify for 60 days or fall plant, needs light, sow on soil surface (Wade). Cold moist stratify 360 days and it grows like dog hair (dl)
Description: general form Similar to *C. vulpinoidea*; plants caespitose culms stems clustered, stout, but soft, usually shorter than the leaves sheaths not cross corrugated, (not wrinkled), but parts of inner sides minutely dotted with orange or brown heads inflorescence compound, of many tiny crowded sessile spikelets, each group of which resemble a single spikelet, ovoid, 0.5-4.5 cm long, soon tinged with red or yellow. spikes Staminate flowers are at top of some to all spikes pistillate scales 2.5 x 1.5 mm perigynia ascending, 2.8-4 mm long, 1.3-2 mm wide, brown tan as they ripen, "*spongy-thickened and noticeably stipitate at the base"* (Wilhelm & Swink 1992), ovate, beak shorter than the body, green to brown, plano-convex, nerveless on the flat face N 2n = 68 key features "Plants of this species have a stout aspect, soft feel, and weak culms with wing-angles and concave sides. The leaves are thin and soft, and the heads are dense, thick-cylindric to lanceolate. The perigynia have a *corky base,* and are brown and nerved on the convex outer face, but flat on the inner nerveless face. This species is similar to *Carex conjuncta*, but: 1) the friable, inner band of the leaf-sheath is not cross-puckered; 2) the fertile scales are commonly brown-tinged." (ilpin)
Comments: Blooms 5-7. 288,000 seeds per pound. Occasional specimens of *C. sparganoides* and *C. cephaloidea* with compound inflorescences may key to this species. Resembles *C. cephaloidea* in habit, but has wider stems, and longer beaked perigynia than *C. conjuncta*. Much of what is in the trade originated at Pine Rock, Ogle County, Illinois.

"Uncommon in damp places; the edge of Mulford woods near the Forest Preserve. The stem is wide, winged, and soft and the sheath is not rugulose." (Fell 1955)

Carex amphibola Steud. var. **rigida** (L. Bailey) Fernald AMPHIBIOUS SEDGE, aka Eastern Narrow-Leaf Sedge, Narrow-Leaved Sedge (*amphibolus -a -um* fired at from all sides, ambiguous, doubtful, from Greek αμφιβολος, *amphibolos*, doubtful, ambiguous, from αμφι-βολια, *amphi-bolia,* doubt, in reference to a peculiar morphology. Compare *diabol-* and *Sporobolus*. Latin *rigidus,* stiff, from the stiff leaves)
Habitat: Fell 1959 cites it from a prairie slough south of Rock Cut, Winnebago County. Rich woods, bottomlands and meadows. (Fernald 1950) distribution Cited from Cook, DuPage, and McHenry cos.
Description: Perigynia 4 x 2 mm, scale 3.5 x 1.5 mm, awn 1.5 mm, differs from *C. grisea* in having the pedunculate staminate spikelet elevated above the pistillate, and in having bluntly trigonous rather than terete perigynia no more than 4.7 mm long and 2. mm wide, and with tapered rather than rounded bases; culms to 8 dm high, leaves stiff, scabrous, 3-7 mm wide, terminal spike staminate or barely with a few perigynia. lateral spikes 3-5, pistillate to 1 – 2.5 cm long, 3 – 6 mm thick (gccr) key features Plant base red-purple. Staminate spikes sessile to short-pedunculate. Pistillate spikes widely separated, some near culm base. Leaves flat dark-green. Pistillate scales with a long, narrow scabrous awn. Perigynia tight about achene, beakless." (ilpin)
Comments: Confusingly like *C. conoidea*? Swink & Wilhelm (1994). Wilhelm & Swink (1992) separated this variety from var. *turgida* Fern. (now *C. grisea***)**

Miller et al. (1999) found *Carex amphibola* Steud. from Poplar Creek to be non AM mycorrhizal, with a dense covering of root hairs (without bulbous bases), and having dark septate fungal infections. Zero of two plants analyzed by Miller et al. (1999) were mycorrhizal.

Carex annectens E. P. Bicknell (or alternately E. P. Bicknell (E. P. Bicknell) FALSE FOX SEDGE, LARGE YELLOW FOX SEDGE, Yellow-headed Fox Sedge, Yellow Fox Sedge, Yellow-Fruited Sedge, Yellowfruit Sedge (*annectens* fastening upon, binding to; annexed, incorporated, from Latin *annectens*, connecting, from *annectere*, to link or join together, the present participle of *an-(necto, nectere, nexi, nexui, nexum* for the approximate spikes,).
Habitat: Degraded low ground (gccr92). In New England sterile often sandy soils, dry or moist. Open wet ground in valleys and swampy, limy meadows
Culture: Germinates well in the greenhouse with no treatment (gni greenhouse 2006). Cold moist stratification may be necessary for some lots.
Description: spikes Staminate flowers are at top of some-all spikes key features "The perigynia of this species are yellow-brown, and prominently nerved on the convex (outer, lower, or dorsal) face. Versus *Carex vulpinoidea*, this species has a narrower, less compound clustering of spikes. The culms are densely cespitose." (ilpin)
Comments: Blooms 5-7. 1,493,421 to 1,940,171 seeds per pound.

Carex annectens (E. P. Bicknell) E. P. Bicknell var. **xanthocarpa** (E. P. Bicknell) Wiegand FALSE FOX SEDGE, aka Golden Fox Sedge, Small Yellow Fox Sedge, Yellow Fox Sedge (*annectens* annexed, incorporated, from Latin *annectens*, connecting, from *annectere*, to link or join together, for the approximate spikes, and *xanthocarpus -a -um* with yellow fruit, from Greek *ξανθος xanthos,* shades of yellow or yellow red, and *καρπος, karpos,* fruit, for the yellow-brown fruit.)
Habitat: Successional, eroded old fields and disturbed, sandy prairies, low depressions in sandy savanna, disturbed hill prairie (gccr92). Low prairies, pastures, and sandy soil, Sandy places, often where it is quite dry. Around ponds and

lakes, marshes, fens and lakes (Mohlenbrock, 2005). Fields, disturbed low ground (rhm02). Open wet ground in valleys, swampy, limy meadows, calcareous spring-fed swamps. distribution Scattered throughout Illinois.
Cultivation Fall plant or cold moist stratify, light. 60 days cold moist stratification. (pm 09) Cold moist stratify for 60 days or fall plant, needs light, sow on soil surface (Wade). Cold moist stratify about 360 days and it grows thick as dog hair (dal). Cold moist stratify for insurance.
Description: general form Similar to *C. vulpinoidea*, but much less common. plants caespitose culms 2.0-3.0' leaves shorter than the culms sheaths note cross puckered sheath and auricle heads inflorescence compound, of many tiny crowded sessile spikelets, each group of which resemble a single spikelet spikes staminate flowers are at top of some-all spikes pistillate scales red tinged perigynia plano convex, nerveless on the flat face, with short, abrupt beaks, 1/3 as long as the body, not winged, plump, becoming bright yellow 3 x 2 mm key features This is the only Carex species with an elongated spike of 10-15 spikelets that are golden brown at maturity and the beak of the perigynia less than 0.8 mm long. The leaves are shorter than the culms, separating this species from *C. vulpinoidea* (Mohlenbrock 2005). Perigynia more ovate than the species, less than 1.9 mm wide, and spikelets congested into spikes seldom exceeding 4.5 cm long (gccr). "Perigynia dark brown, obscurely nerved on the convex (outer lower, or dorsal) face." (ilpin)
Comments: Blooms 5-6. Wetland restoration, successional, bunching. 1,440,000 to 1,638,989 seeds per pound.

"*C. brachyglossa* Mack. Much like *C. vulpinoidea*, differing from it as follows; it is uncommon, usually grows in drier places often on sand, the leaves are shorter than the stems which are erect and do ot spread out. (*C. annectens* Bickn. var. *xanthocarpa* (Bickn.) Wieg.)" (Fell 1955)

Two of five plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, and hyphae.

Carex aquatilus Wahlenb. var. **altior** (Rydb.) Fernald WATER SEDGE, aka Aquatic Sedge, Common Wetland Sedge, Long-Bracted Tussock Sedge (*aquatilis -is -e* Latin *aquatilis*, aquatic, of water, swimming, living in or growing by water, floating in water, for its habitat, and *altior* from Latin *altior*, taller, higher, from *altus*, high, and comparative suffix, more so, to a greater degree, for the variety's taller than typical culms.)
Habitat: Wet meadows, marshes, along streams and ditches, calcareous prairies (gccr92). Shallow water, wet or swampy soils; Wet shores and floating alkaline peat mats; Marshes, wet meadows, wet ditches, along and in streams (Mohlenbrock 2005). Mid to high elevations, 2,000-4,500' medium to fine textured soils, neutral to basic, low acid tolerance, medium salinity tolerance. It has a preference for wet, calcareous soils. Marshes, wet meadows, wet ditches, along streams (rhm02). distribution Circumboreal species, south to California, New Mexico, and New Jersey. Occasional in the n. cos. of Illinois, much rarer elsewhere in the state (rhm02).
Culture: Inferred physiological dormancy (Baskin & Baskin 2002). Fall plant or cold moist stratify, light. 2003 GNI greennouse modest germination after 60 days cold moist stratification. Most lots are highly dormant, with very limited germination. (gni)

David E Steinfeld (2001), using seed from the high Cascades, placed seed in cloth bags in cool running water for 2 days and layered bags between sphagnum moss @ 35° F for thirty days. Germination tests were run using five methods, with the following results.

1) no stratification 25%
2) 30 days cold stratification (1ºC) 25%
3) 30 days cold stratification in sphagnum moss 40%
4) 60 days cold stratification in sphagnum moss 30%
5) seed scarified for several minutes in drum sander and 30 days cold stratification 15%

Emergence was within 10 days. Green house temperatures 90 to 95°F daytime and 70°F nights, with 90-100% humidity from foggers and lights on 24 hours. Seedlings were lined out in a constructed basin, but those less than 18 inches tall drowned.

David E Steinfeld (2001a), using valley bottom seed conducted the same experiment, using the same pretreatments, with the following results:

1) no stratification 99%
2) 30 days cold stratification (1ºC) 99%
3) 30 days cold stratification in sphagnum moss 97%
4) 60 days cold stratification in sphagnum moss 95%
5) seed scarified for several minutes in drum sander and 30 days cold stratification 80%

Plant 5 pls lbs per acre in fall or spring for pasture (Granite). Alone seed 1-2 lb/acre fall or spring (Rainier).
Description: general form Abundant species, conspicuous or dominant in respective habitats, tall grass-like cool season, sod forming, perennial, plants cespitose, forming small clumps, plant often forming dense tussocks, but also spreads by short to elongate, strong rhizomes roots forming elongated scaly stolons culms shorter than to occasionally longer than the leaves, 1.5-3.0' 36", sharply trigonous and rough above, bluntly trigonous below and smooth, bases reddish, phyllopodic leaves all with well developed blades, V-shaped, 3-8 mm wide; long and slender, retaining the blue green color through autumn, last years leaves persistent heads inflorescence arching spikes with 3-9 slender, many flowered pistillate spikelets below several slender staminate pistillate scales 3 x 1 mm scales usually shorter than perigynia sometimes longer perigynia 2.5 x 1.5 mm, or 2.5-3.5 mm long 1.5-2.6 mm wide, widest above

middle and thicker at margins, pale blue green often minutely mottled with purple brown achenes flattened stigmas 2 key features The reddish brown plant bases and last year's persistent leaves. Key differences between the similar *C. emoryi, C. haydenii,* and *C. stricta* are the well-developed blades of the lowermost sheaths (the others aphyllopodic?) and the perigynia which are broadest above the middle (Mohlenbrock, 2005). *"It differs grossly* (from *C. stricta*) *in the persisting old leaves"* (Fell 1959) Similar to *C. stricta*, but coarser and lacking pinnate fibrils bases often reddish? to reddish brown, *less likely to be in dense clumps*).
Comments: Blooms 4-6. Wetland restoration, riparian restoration, good erosion control, excellent palatability for livestock and wildlife, good wildlife ratings, satisfactory to good forage producer, often a significant component of meadow hay. 679,132 to 1,360,544 seeds per pound.

"Much like *C. stricta* and in the same places: separated by the stems being phyllopodic and the old leaves persisting. (*C. aquatilis* var. *substricta* Kukenth)" (Fell 1955 as *C. substricta* (Kukenth.) Mack.)

Mohlenbrock (1999, 2002, & 2005) refers to Illinois material as *C. aquatilis* var. *substricta*, while Wetter et al 2001 uses *C. aquatilis* var. *aquatilis* in Wisconsin as synonymous? with the two named Illinois varieties. Yatskievych (1999) states var. *altior* (Rydb) Fernald is synonymous with the circumboreal var. *aquatilis*. Mohlenbrock (2005) notes typical *C. aquatilis* has less pronounced triangular stems. And for the final straw, the type specimen of variety *altior* is actually *C. emoryi*.

Carex atherodes Sprengel *IL-IN, ME, NY, PA AWNED SEDGE, *Carex épi-de-blé,* Hairy Lake Sedge, Hairy-Leaved Lake Sedge, Long-Beaked Hairy Sedge, Slough Sedge, Wheat Sedge, (Greek *ather*, an ear of wheat, and –*oides*, likeness, for the pistillate spikelets resembling a spike of wheat.)
Habitat: Wet meadows. Shallow water and wet soils. In moist meadows and marshes, sometimes forms solid stands (gccr92). Wet meadows, marshes, occasionally in standing water (Mohlenbrock, 2005). Wet meadows, marshes (rhm02). In New England, calcareous meadows, wet open thickets (afne). distribution Occasional in the n. ¼ of Illinois, apparently absent elsewhere. Uncommon and local in the east, more common in the Midwest and west, also Eurasia.
Culture: 60 days cold moist stratification (pm 09). Clone, seed crops unreliable and unproductive; fall plant or cold moist stratify, light.
Description: general form Robust plants cespitose, running from slender, long-creeping rhizomes. Stout, coarse rhizomatous sedges, forming large monotypic stands to 10 m across roots forms large clones culms numerous pseudoculms 0.5-1.5 m high, usually taller than the fruiting culms, bases reddish and pinnate fibrillose, aphyllopodic leaves M-shaped 4-10 mm wide sheaths some sheaths and parts of blades finely pubescent, unless inundated in deeper water spikes spikelets ascending, cylindrical, 2.5 cm long, scattered on erect culms, the lower 1-4 pistillate, the upper 2-5 staminate pistillate scales acute, 5 x 2 mm 2.0-4.0' perigynia somewhat inflated, 6.5 x 3 mm, teeth 1.5 mm, beak with teeth 2.5 mm perigynia teeth 2-3 mm long stigmas 3 key features The usually pubescent leaves and sheaths, the several staminate spikes, and strongly nerves perigynia with long toothed beaks, frequently growing in dense colonies (Mohlenbrock, 2005). "Loosely cespitose with softly villous leaves pistillate spikes often staminate at the tip and densely flowered; achene enclosed in a many nerved, bidentate, beaked perigynium." (ilpin)
Comments: Blooms 5-6. Wetland restoration, cool season, forms large colonies, aggressively rhizomatous. 226,800 to 417,000 to 2,500,000 seeds per pound.

Easily distinguished by pubescence on upper portions of the sheath. One of few sedges ID-able by vegetative characteristics. Seed crops may be few and far between, and of dubious viability. Self-incompatable? It puts most reproductive energy into aggressive rhizomes. The first recorded colony in Illinois was on the Ogle-Winnebago County line north of Davis Junction.

"Found by us in the prairie slough in the southwest part of the county south of Killbuck Creek. It has a very wide northern distribution but we have seen it only in this slough, in Ogle And in Winnebago counties. The pubescent sheaths are very distinctive." (Fell 1955)
Associates: *C. atherodes* is considered nonmycorrhizal and has bulbous-based root hairs. The unusual root hairs may represent an adaptation for nonmycorrhizal growth. (Miller et al. 1999) Zero of three plants analyzed by Miller et al. (1999) were mycorrhizal. Wind pollinated. Seed is dispersed by wind and water.

Carex bebbii (L. H. Bailey) Olney ex Fernald *IN, NH, PA BEBB'S SEDGE, aka Beautiful Sedge, Bebb Sedge, Bebb's Oval Sedge (for Michael Shuck Bebb, early northern Illinois botanist, 1833-1895, who lived near Seward, willow expert, of *Salix bebbii* fame) (Oval sedge referring to the Ovales section of the genus.)
Habitat: Rather common in wet places, wet road ditches, wet meadows and shores, especially in calcareous soils, alkaline. Pond shores, boggy meadows, and moist sand flats, usually calcareous. Wet meadows, clearings, and rarely in woods. Calcareous fens, alkaline bogs, low calcareous prairies and pothole marshes. (gccr92) Wet prairies, bogs, calcareous fens, marshes (Mohlenbrock 2002, 2005). "Wet places with calcareous or neutral soils, gravelly lakeshores, stream banks, meadows, forest seeps." (fna) "Calcareous wetlands; rare." (Weakley 2008) Wet meadows and saturated soils from low to mid elevations, 2,000-4,500'. In New England, shores, meadows, forest seeps, usually in calcareous or neutral soils (afne). Tolerant of medium and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance

medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance none or medium. Shade tolerant. pH 4.6-7.0. distribution Occasional to frequent in the n. ½ of Illinois, uncommon in the s. ½ .
Culture: 60 days cold moist stratification (pm 09). Hulled seed germinates very well in the greenhouse with no treatment (gni greenhouse 2006). Germination mechanisms have wide ranges from year to year. Moist stratification may improve germination, but a decent crop can be often be grown without moist stratification (gni). Fall plant or cold moist stratify-light. When seeded alone plant 1 lb/acre in fall or spring (Rainier). When seeded alone for pasture (western USA), drill 2 lb pls per acre in fall or spring. Growth rate moderate. Seedling vigor low. Vegetative spread rate none. Spreads slowly from seed.
Description: general form Common plants, densely caespitose, densely tufted short to tall grass-like roots from short compact black to brown fibrillose rootstocks, 8" minimum root depth culms slender stems, 13-36+", without pseudoculms aphyllopodic leaves blades narrow, 1-4 mm wide heads spikelets 3-15, but usually 5, crowded at culm tip, small and rounded, all alike, short sessile, warm reddish brown at maturity, "Absence of the characteristic brown color of the spike may cause confusion" (Fell 1959) spikes most have pistillate flowers at tip, staminate flowers confined to taper ends of spikelet bases pistillate scales 2.5 x 1 mm perigynia ovate, 2 (rarely 3) times as long as wide, 2.5-3.3 mm long, 1-1.6 mm wide, < 2 mm wide, perigynia 3.5 x 2 mm, beak 1 mm, nerveless on the inner face; thin and scale-like, with translucent margins or wings, wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 68, 70 key features The very narrow perigynia less than 1.5 mm wide that are nerveless on the inner face and winged all the way to the base, with crowded spikes that are longer than broad (Mohlenbrock, 2005). Perigynia winged; plants mostly cespitose, sans well-developed rhizomes; mature perigynia ovoid-suborbicular, and less than or equal to 2 1/2 times longer than wide. Spikelets abruptly contracted at base, perigynia at most with length 2 times width. Spikelets crowded into a head." (ilpin)
Comments: Blooms 5-6. Wetland restoration, riparian restoration, good erosion control, satisfactory to good palatability for livestock and wildlife. Good wildlife ratings, provides food and cover for wildlife. Very good xeriscaping? As the seeds mature, the culms tend to severely lodge. "In addition to typical perennial behavior, *Carex bebbii* may reach reproductive stage from seed in a single season, thus behaving as a facultative annual." (fna) 648,000 to 2,864,353* seeds per pound.

"Boggy places in Kent Creek bottom, an old drainage ditch east of Sugar River Forest Preserve and one west of Yale Bridge. Rather common. At times a lack of the characteristic brown color of the heads makes for confusion with the preceding (*C. cristatella*). In Kent Creek bottom on North Central avenue is what appears to be a hybrid of this and *C. scoparia*." (Fell 1955)

Carex bicknellii Britton * ME, NY, OH, PA BICKNELL'S SEDGE, Bicknell's Oval Sedge, Carex de Bicknell Copper Shouldered Oval Sedge, Prairie Sedge (*bicknellii* in honor of Eugene Pintar *Bicknell*, 1859-1925, New York business man, and amatuer naturalist and ornithologist, see also *Hylocichla minima bicknelli*, Bicknell's Thrush)
Habitat: Dry prairie plant, mesic, dry, and sand prairies; dry to wet prairies. Characteristic plant of dry prairies, frequent (gccr92). Dry prairies, old fields, dry slopes (rhm02). "Dry to mesic prairies, open woodlands, rock or sand barrens." (fna) "Prairie-like openings and barrens over gabbro; rare." (Weakley 2008) Dry wooded slopes over shallow soils. In New England, dry slopes, fields, open woods, rock or sand barrens (afne). Tolerant of coarse, medium,and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 4.5-6.6. (probably a bit low, as it grows in residual limestone soils.) distribution Occasional to common in the n. ¾ of Illinois, apparently absent elsewhere. "Not common in this county. In low prairie situations south of Killbuck Creek Forest Preserve and east of Winnebago and to a less extent in a shallow bog west of South Beloit." (Fell 1955)
Culture: Germinates well in the greenhouse with no additional treatment (Genesis greenhouse 2006). Most lots are predominately non-dormant, and moist stratification will improve germination, but an adequate crop can be grown most years without. Fall plant or cold moist stratify, light (gni). "Cold moist treatment or fall sow. Light cover. Very good germination" (mfd 1993). 60 days cold moist stratification (pm 09). Growth rate moderate. Seedling vigor low. Vegetative spread rate none. Spreads slowly from seed.
Description: general form Plants caespitose, slender roots 8' minimum root depth culms 1.5-2.5' heads spikelets all alike, short sessile,spikelets oviod and pointed at both ends when immature, resembling young *C. tenera* and *C. scoparia*, somewhat spaced on the culm spikes staminate flowers confined to tapering spikelet bases pistillate scales 4 x1 mm perigynia large, ovate, beaked, 4.5-7 mm long and 3-4 mm wide (5.5 x 3.5 mm) thin and scale-like, with translucent margins or wings, with 4-7 prominent parallel nerves over achene on inner face, margins orange brown and of irregular width; wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 76,78 key features Cespitose like *C. brevior* and *C. festucacea*, but stems fewer (Fell 1959). Aspect - cespitose, sans well-developed rhizomes. Spikelets less than 15 mm long, spikes ovoid to lanceolate-ovoid; few sterile leafy culms, leaves-sheaths narrow or broad, white hyaline. Perigynia and achenes-stigmas 2, achenes, perigynia winged to base; length 5.25-6 mm, width 3.25-4.25 mm beaks ascending/appressed, ventrally and dorsally nerved. Hyaline and smooth; body orbicular. The silvery brown or straw-buff, light-colored scales and perigynia mark this species in the field." (ilpin)
Comments: Blooms 5-6. Landscaping, cool season, bunching. 272,000 to 488,172 seeds per pound.

Associates: Nine of ten plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, hyphae, and intra-radical spores.

Carex blanda Dewey WOODLAND SEDGE, aka Bland Sedge, *Carex lisse*, Common Wood Sedge, Eastern Wood Sedge, Eastern Woodland Sedge "From Latin *blandus*, mild, alluring, smooth, perhaps from the curved perigynia, a somewhat unusual feature, charmed Mr. Dewey" (Wilhelm & Swink 1992).
Habitat: Mesic savanna, disturbed woodlands, disturbed prairies; dry to wet deciduous woods, along paths and roadsides. Weedy sedge, open meadows, disturbed mesic prairies, ditches, shaded parks and woodlands of all sorts (Swink & Wilhelm 1994). "A common early sedge found in woods and on shady roadsides." (Fell 1955) "Woods and open places all over…" Woods, meadows, mesic prairies (rhm02). In New England, woods, deciduous or mixed, bottomlands, meadows (afne). Tolerant of medium and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 4.4-7.0. distribution Common, throughout Illinois.
Cultivation Best by division, any time with care. Species in the *C. laxiflora* group are reported to be hydrophilic seeds. (Cullina 2008). Plant early and plant often. Summer plant or cold moist stratify fresh seed, light. Germination spotty and irregular, highly dormant. Dried seed is dormant as a doorknob. 2003 Genesis germination slowly starting low to modest after 60 days cold moist stratification, somewhat extended germination. Very susceptible to planting too deeply, a strong light requirement? Beware the smut. (gni) Growth rate slow. Seedling vigor low. Vegetative spread rate none. Spreads slowly from seed.

Self sows adundantly in our backyard, and volunteers in between rows in production beds, volunteers in our lawn in spite of close, frequent mowings, but in the green house it is seems highly dormant needing long stratification. Treat as hydrophylic.
Description: general form Very common early sedge, bunching roots 8" minimum root depth. culms 0.5-1. plant base brown leaves 3-12 mm wide green to blue green spikes terminal spike staminate or gynaecandrous; lateral spikes 2-5 pistillate, staminate spikelet often short-stalked and partly hidden among the pistillate spikelets pistillate scales with abruptly awned midribs, appressed to the perigynia perigynia 25-30 nerved, obovoid, bluntly triangular 3-3.5 (4.5) mm long, asymmetrical, with orifice or slight beak on one side of blunt apex (4.5 x 1.5 mm) *sometimes aborted by fungi* N n = 15-18, 2n = 30, 32, 34, 36 key features "If the minutely pubescent sheaths of *Carex hitchcockiana* are overlooked, it would probably key here (Swink & Wilhelm 1994). "Narrow leaves. Edges of bracteal sheaths strongly serrulate. Staminate spikes sessile to subsessile. Pistillate spikes separated, on slender 2-edged, minutely serrulate peduncles. Pistillate scales acute-aristate. Perigynia round-triangular, swollen, asymetric, abruptly contracted into strongly bent beak. One of most abundant and widespread species in Missouri and Indiana." (ilpin)
Comments: Blooms 4-6. 212,249 seeds per pound. Swink and Wilhelm (1994) call this our weediest sedge. If this sedge is so damn common and weedy, why is there a continual shortage of seed, and why don't more people grow it? ***Very limited to non-existant availability as seed or plants***, but that doesn't bother any wetland designers. USDA says this is routinely available, but can anyone name 4 sources, or find one pound of seed, or state exactly when it is ripe?

This species is the most common and abundant member of the section *Laxiflorae*, to the point of being weedy. It grows in a broadest variety of environmental and edaphic conditions of the section *Laxiflorae*. "Plants of *C. blanda* from drier or wetter habitats usually produce narrower leaves and/or culms than plants from mesic or shaded habitats. Additional research is needed to determine if these are simply expressions due to environment and edaphic conditions or a complex of closely related species or varieties." (fna)
Associates: *Carex blanda* is known to be occasionally infected with the smut fungus *Anthracoidea blanda*. (http://www.ku.edu/~eeb/faculty/alexanderh.html) Part of our 2005 crop that was not destroyed by drought was infected with smut.

Three of nine plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, and hyphae. ilpin says nonmycorrhizal.

A favored winter food of rabbits. Possibly allergenic to humans.

Carex brevior (Dewey) Mackenzie ex Lunell "SHORTER SEDGE", aka Brevior Sedge, *Carex â tête*, Field Sedge, Plains Oval Sedge, Short Beak Sedge (*brevior* shorter, more short, from Latin comparative of *brevis*, short; little, *-ior*, more so, to a greater degree, for the perigynia which are shorter than some closely related species.)
"When in doubt, its *Carex brevior*. Deal with it! Fairly common on roadsides." (www.sedgehead.com)
Habitat: Mesic, dry, and sand prairies. Open habitats, usually with a history of disturbance, sandy prairies, dry woods, dry ground along railroads, in ballast or sandy waste ground (gccr). "Prairies, meadows, openwoods, dry roadbanks, often in calcareous or neutral soils." (fna) "Dry forests and margins; uncommon." (Weakley 2008) Dry sand and dry prairies, dry sandy roadsides, wet river bottom prairies, and wet open valleys. "A common roadside sedge growing typically on upland prairie." (Fell 1955) Sandy prairies, dry woods, along railroads, often in disturbed areas (rhm02). In New England, dry open soil, often in calcareous or neutral soils (afne). distribution Scattered to common in the n. ¾ of Illinois.

Culture: 60 days cold moist stratification (pm 09). Cold moist stratify-light. (Code C, D Ken Schaal). Good greenhouse crop with moist stratification. Some lots may be non-dormant. (gni)
Description: general form A common (?) sedge, plants caespitose, slender culms thin and stiff, 1.0-1.5' tall heads spikelets 2-6, usually few and with rounded tops, spread out or crowded, ovoid but often with a slender tapering brown base, all alike, short sessile spikes most have apical pistillate flowers; staminate flowers confined to tapering spikelet bases pistillate scales 4 x 1.5 mm perigynia ovate, beaked, green to pale brown, with perfectly circular nerveless body and evenly wide white wide wing, and 2.2 - 4.2 mm wide (5 x 3.5 mm, beak 1 mm) thin and scalelike, with translucent margins or wings, wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 48, 52, 56, 60, 64, 68 key features "*Carex brevior* has more noticeably clavate, less often aggregated spikelets, and acuminate scales which reach well beyond the base of the beak. Typically it is nerveless or nearly so on the ventral face, but some of the material from our eastern sector approaches *C. molesta* in having a few well-developed nerves. *Carex cumulata* is more rhombic as a result of the much narrowed wings below the middle and the virtually cuneate base." (gccr) "Aspect - plants cespitose, sans well-developed rhizomes; spikelets slightly overlapping. Mature perigynia: 1) winged, 2) broadly obovoid-orbicular (widest above or below middle), 3) width at 3-4 mm, length at 4-5 mm, and 4) beaks spreading. Leaf sheaths white-hyaline ventrally." (ilpin)
Comments: Blooms 4-6. C3. Landscaping, bunching. Occasionally volunteers in mesic plantings, probably from seed bank, or just plain weedy. 330,301 to 533,000 seeds per pound.

"*Carex brevior* seems to display an unusually broad, aneuploid *(having or being a chromosome number that is not a multiple of the monoploid number)* chromosome series that does not readily correlated with any features of external morphology (P. E. Rothrock and A. A. Reznicek 1998). The chromosome variation may, however, have a geographic relationship. Among the plants observed, the lowest number came from northeast Texas while the highest number (n = 34) came from Manitoba (Á. Löve and D. Löve 1981b)." (fna)
Associates: Four of five plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, and intra-radical spores.

Carex bromoides Shuckuhr ex (in?) Willdenow *TN BROME-LIKE SEDGE, aka Brome Sedge, Brome Hummock Sedge (*bromoides* resembling wild oats, *Bromus*, from *Bromus* and Greek *–oides*, with the form of, for a supposed resemblance to to a brome.)
Habitat: Fens and wooded swamps, flat woods, wet woods and river floodplains. Springy woods and swamps, base of a wooded bluff, morainic flatwoods, moss-covered logs, hydromesophytic swamps behind the high dunes of Lake Michigan in peaty swales (gccr). Low woods, seep springs, swamps, prairie bogs (Mohlenbrock, 2002, 2005). In New England, rich, low woods and swamps. distribution Scattered in northeast Illinois, also Jackson and Pope cos.
Cultivation Fall plant or cold moist stratify-light. Good greenhouse crop with moist stratification. Some lots may be non-dormant. (gni) Mature clumps can be divided.
Description: general form Plants densely caespitose roots from long, thin, blackish, fibrillose rootstocks culms 0.5-0.9' leaves leaves 1-2.1 (2.5) mm wide heads spikelets sessile, small, all alike, longer than broad; overlapping; spikes Staminate flowers or remnants are at base of some spikes perigynia slenderly lanceolate, nearly terete, strongly nerved on convex dorsal face, green, 0.9-1.1 (1.3) mm wide,4-5.5 mm long, with a *spongy tapered base,* closely appressed and hidden by the scales fitting tightly over the plump achenes, but with the elongate serrulate beaks empty, 1.5 mm long stigmas 2 N 2n = 64, 66, 68 key features Key characteristics are dense clumps of very narrow leaves, extremely narrow perigynia less than 1 mm wide. *C. deweyiana* is similar, never aquatic, and having perigynia at least 1.5 mm wide that are nerveless on the convex face (Mohlenbrock, 2005). "Perigynia sans wings, lower part spongy-thickened. Perigynia 4-5 mm l., narrowly lanceoloid; appressed at maturity. Very slender, lax, green; perigynia margins serrulate; apex bidentate." (ilpin)
Comments: Blooms 4-5. Wetland restoration, landscaping. 1,459,807 seeds per pound. Our plants seem to do well for several years in production fields, in rich soil full sun, with supplemental water. A delicate ornamental.

Carex bushii Mackenzie *CT, IN, ME, MA, NJ, OH BUSH'S SEDGE, aka Long Scaled Green Sedge (after its discoverer, Benjamin Franklin Bush, 1858-1937, American botanist)
Habitat: Usually dry woods, dry meadows, old fields (rhm02). Open grassy slopes, wet river bottom prairies, open swales, swamps, and ditches. Rarely rich woodland slopes and ravines. Dry to mesic grasslands, forest margins. Tolerant of medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance high. Drought tolerance low. Fertility requirement medium. Salinity tolerance low. Shade tolerance intermediate. pH 5.8-7.5. distribution Native south of Chicago. Common in the s. ½ of Illinois and McDonough County, becoming less common northward; apparently adventive in Cook, DuPage, and Lake cos. Locally established in Wisconsin.
Cultivation Cold stratify, light. Growth rate slow. Seedling vigor low. Vegetative spread rate none. Spreads slowly from seed.
Description: roots 8" minimum root depth spikes terminal with staminate flowers or remnants and perigynia in some spikes; male conspicuous at the base, lateral spikes (1-2) pistillate N 2n = 64 key features Terminal spikelet pistillate

at summit, pistillate scales long tapering, exceeding the perigynia. "blades and leaf sheaths are soft-pubescent. Pistillate spikes are ovoid to short-cylindric. The scales are prominently awned and exceed the perigynia." (ilpin)
Comments: Blooms 5-6. 128,000 to 177,778 seeds per pound. Coming soon to a seed room near you.

Carex buxbaumii Wahlenberg * CT, KY, MD, NH, NY, PA, TN, VT, WA ANDES MINT SEDGE, aka Brown Bog Sedge, Brown Sedge, Buxbaum's Sedge, *Carex de Buxbaum*, Dark-Scaled Fen Sedge, Dark Scaled Sedge (*buxbaumii* New Latin for Johann Christian *Buxbaum*, 1693-1730, German botanist, member of the Russian Academy of Science, professor of botany at St. Petersburg, one of the first to write on the flora of Estonia, collected plants in the Far East; see also *Buxbaumia*, a genus of mosses (order *Buxbaumiales*))
Habitat: Wet meadows; open wet meadows, floating peat mats, and wet prairies. Calcareous marshes, calcareous prairies, calcareous swales (gccr). "A common sedge in the sloughs in Coon Creek bottom and in low places in Kent Creek." (Fell 1955) Damp open places. Marshes, wet prairies, swales, usually in calcareous areas (Mohlenbrock 2002, 2005). In New England, shores, meadows, swamps, marshes, bogs (afne). In the SE, bogs, fens, and seepages, especially over calcareous or mafic rocks (Weakley 2007). distribution Occasional in the n. ½ of Illinois; also Montgomery, Richland, Shelby, St. Clair, and Washington cos. Clay co? Circumboreal.
Culture: Preliminary data indicate seed is highly dormant (gni). Fall plant or cold moist stratify, light. Plants will spread vegetatively quite well to aggressively in favorable habitats.
Description: general form Occasional sedge, resembles *C. stricta, p*lants cespitose roots rhizomatous, from long, horizontal rhizomes (Mohlenbrock, 2005), stolons are noted in Ilpin culms 1.5 - 2.5'. bases reddish leaves blue green, 1.8-3 mm broad sheaths with sheaths pinnate-fibrillose heads spikelets plump, the terminal one staminate only at the base spikes terminal spike pistillate toward apex, staminate below, the laterals (1-4) pistillate pistillate scales slenderly acute, longer than the perigynia, 5 x 2 awn 1.5 mm perigynia 2.4-4.33 mm long, 3 x 2 mm achenes nearly filling the perigynia N 2n = ca. 106 key features Dark red-purple aristate pistillate scales and minutely beaked, glaucous perigynia (Mohlenbrock, 2005). "Leaves are narrow, and pale-green, glaucous. Pistillate spikes are erect to ascending, sessile to short-pedunculate. The whitish perigynia are short-beaked or beakless." (ilpin)
Comments: Blooms May. Wetland restoration, calcareous. 336,795 to 567,000 seeds per pound.
Two of two plants analyzed by Miller et al. (1999) were mycorrhizal, having vesicles and hyphae.

Carex cephaloidea (Dewey) Dewey *IN, OH THINLEAF SEDGE, aka *Carex céphaloïde*, Clustered Bracted Sedge (*cephaloideus -a -um* head-like, capitate, Greek *kephale*, head, and *-oides*, with the form of, for the headlike spike.)
Habitat: Maple-basswood forests. Low or rich, sometimes disturbed woods (gccr). Rich woods, sometimes disturbed meadows (rhm02). In New England, rich woods. Bottomlands and forest margins, on neutral or basic soil (afne). Dry to mesic deciduous and mixed forests on neutral to basic soils (fna). distribution Occasional in the n. 3/5 of Illinois, rare elsewhere.
Culture: Limited data suggest this seed is non-dormant (gni).
Description: general form Similar to *C. sparganoides*, plants caespitose, loose tufted perennial from short, stout fibrillose rootstalks roots without conspicuous rhizomes sheaths lower cross puckered heads spikelets aggregated into an ovoid head spikes spikelets short, sessile; staminate flowers at apex of each spikelet, a tiny club-shaped mass of whitish scales remaining after anthesis 1.5-4 cm long pistillate scales 3 x 2 mm perigynia plano-convex, ovate, nerveless on flat face (4.5 x 2 mm, beak 2 mm, green at maturity, becoming pale yellowish 3-5 mm long, delicate, glossy stigmas 2 N 2n = 50 key features "Differs from *C. alopecoidea* in having thin stems and from *C. aggregata* in having long beaked perigynia and short scales. More common than *C. aggregata* and much less common than *C. sparganoides* which it resembles. This and *C. aggregata* are sometimes considered shade forms of *C. gravida.*" (Fell 1959)
"Less common than *C. sparganoides*, which it resembles except that the inflorescence is compact." (Fell 1955)
"It is very similar to *Carex aggregata* and *C. sparganioides* and very difficult to separate from these two species except by close examination of the pistillate scales, leaf sheaths, and other technical characters. Immature material is virtually impossible to determine accurately. However, the culms of *C. cephaloidea* usually are more roughened than those of other closely related sedges and the pistillate scales are scarcely half as long as the body of the perigynia." (fna)
Comments: Blooms 5-7. 652,299 to 763,667 seeds per pound.

Carex cephalophora Muhlenberg ex Willdenow CAPITATE SEDGE, aka *Carex porte-tête*, Oval-Headed Sedge, Oval-Leaf Sedge, Short-Headed Bracted Sedge, Wood-Bank Sedge (Greek *kephale*, head, and *phoros*, a bearing, or to carry, for the spikelets borne in heads.)
Habitat: Common in woodlands, rare in lawns, fields, and open grassy areas. Dry deciduous forests and dry open cherty, rocky, limy, or sandy woodlands. Beech maple woodlands and oak hickory woods (gccr). Woods, fields, lawns (rhm02). "Common in dry open woods." (Fell 1955) In New England, dry, deciduous or mixed woods and openings (afne). distribution Common throughout Illinois.

Culture: 60 days cold moist stratification (pm 09). Cold moist stratification is not absolutely necessary but will improve germination (gni).
Description: general form Common sedge, plants densely caespitose, smaller than *C. cephaloidea* culms thin stems, which often recline, are longer than leaves leaves 2-4.5 mm wide, shorter than the thin stems sheaths slightly thickened at the apex heads 0.7-1.8 cm long, with numerous thread-like bracts spikes spikelets short, sessile; staminate flowers at apex of each spikelet, a tiny club-shaped mass of whitish scales remaining after anthesis pistillate scales 2 x 1 mm perigynia 2-3 (3.5) mm long, often > 2 mm wide, plano-convex, ovate, nerveless on flat face, green at maturity, becoming orange to yellowish stigmas 2 N 2n = 48 key features "Pistillate spikes or mixed spikes are globose or nearly so or as broad-broader than long." (ilpin)
Comments: Blooms 4-6. Frequent species, 378,000 to 559,458 seeds per pound.
Associates: Three of eight plants analyzed by Miller et al. (1999) were mycorrhizal, having hyphae. Minor food value to large mammals. Provides food and cover for small mammals and upland birds.

Carex comosa Boott *KY, TN, WA BRISTLY SEDGE, aka Bearded Sedge, Bottle Brush Sedge*, Carex à toupet*, Cosmos Sedge, Longhair Sedge, Porcupine Sedge (*comosus -a -um* with long hair, hairy, with hairy tufts, comate, from Latin *coma,* hair and *-osus,* full of, prone to, from the hairy appearance, or in reference to some plants, leafy, or tufted, in this species from the hairy appearance of seed head with divaricate scales and slender perigynia)
Habitat: A semi-aquatic emergent sedge. Shorelines and ditches; wet or floating peaty shores; prefers 0-12" water. A northern species. Marshes and wet meadows. Pond margins and shores, deep marshes, boggy places (gccr). Swamps, boggy areas, wet ditches, pond margins (rhm02). In New England, swamps, shores, marshes, meadows (afne). Sinkhole ponds and oxbows. Tolerates early seasonal flooding. Nutrient load tolerance low. Not silt tolerant. Tolerant of medium and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance low. Shade tolerance intermediate, partial to full sun. pH 4.6-7.5. distribution Frequent in the n ½ of Illinois, becoming less common southward (rhm02).
Culture: Fall plant or cold moist stratify, light. Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). Germination does occur with dry stored seed sown in the green house with light cover, and good crops can be grown, but cold treatment can significantly improve germination of some lots. This Carex, and others with large, inflated perigynia, need *shallow* incorporation into the soil, or *very light* cover, or the seed will never hydrate enough to sprout until the perigynia rots away, as it does in nature. An alternative is to remove the perigynia, which is beneficial because the perigynia of some species are known to contain germination inhibitors. (gni)

In mixes plant up to 0.125 pls lb per acre (USDA 1997)

Can be successfully established from field sown seed, but best established from plugs. Plant on 0.5-1.5' centers in constructed urban wetlands due to slow rate of spread in adverse conditions. Growth rate slow. Seedling vigor low. Vegetative spread rate moderate. Spreads slowly from seed.
Description: general form Robust, caespitose perennial sedge; clump-forming marsh species roots clumps gradually increase in diameter by short rhizomes, 8" minimum root depth culms 1.5-4.0', bases red brown, pinnate fibrillose leaves 7-18 mm wide, yellowish green, M shaped in cross section spikes terminal staminate, occasionally with a few perigynia, lateral spikes 3-6, pistillate, staminate spikelets 1-3 above clustered, stalked, erect, or drooping pistillate spikelets that are thick-cylindrical pistillate scales abruptly narrowed into a long awn, 5 x 1 mm perigynia inflated, divergent to reflexed, numerous pale green, 1-4-1.8 mm wide (7 x 1.5 mm, beak 3 mm, teeth 1.5 mm, stipe 1 mm) 13-20 (14-22) strong nerves persisting as 'bird cage' around achene when rolled between fingers stigmas 3 key features "Culm bases and rhizomes sans fibrillose scales. Culm bases green-brown. Flowering culms over 1/5 m., mostly exceeding leaves. Foliage flat, not glaucous. Pistillate spikes subglobose-oblong, ascending-spreading on stout, rough pedicels, pistillate and staminate spikes conspicuous. Pistillate scales linear-lanceolate, shorter than to barely exceeding perigynia, serrulate awned. Perigynia beaked, the beak toothed; perigynia reflexed to widely divergent." (ilpin)
Comments: Blooms 5-6. Resembles the smaller *C. hystericina*. Wetland restoration, can be short-lived on drier sites. Good shoreline stabilizer from plugs. 429,721 to 534,118 seeds per pound. "Found in Kishwaukee River bottom on Newburg road on the Boone County side of the line but we have not found it in Winnebago County. The Chicago Natural History Museum has Bebb specimens from "Fountaindale" and "Pekatonica"." (Fell 1955)
Associates: Provides food and cover for wildlife. Fruits are eaten by waterfowl. Provides food for sora and yellow rails, swamp sparrows, and tree sparrows, snipe and other song birds.

Carex conjuncta Boott. *MI SOFT FOX SEDGE, aka Green-Headed Fox Sedge (*conjunctus -a -um* united, bound together, from Latin *conjunctus*, united, coupled, for the spikelets.)
Habitat: Low wet prairies or prairie streams, damp woods. Shaded wet ground. "Very rare with us, its habitat is not well known. Apparently it was a plant of low wet prairie or prairie streams, … which are all but gone... "(gccr) Common in bogs, marshes and swales (Pepoon) Moist woods, swamps, wet prairies (rhm02). Wet river bottom prairies, swales, wet open valleys; low wet, alluvial or rich woods; calcareous bottoms and swales (ilpin). distribution Occasional throughout Illinois.

Description: general form Looks like a diminutive *C. stipata*, maturing about a month later culms stems clustered, stout but soft, about equaling the leaves sheaths cross corrugate ventrally spikes staminate flowers are at top of some-all spikes perigynia the base *spongy-thickened* key features "Like *Carex alopecoidea,* this species has soft culms with wing-angled, concave sides, and its fertile scales are whitish. Unlike *C. alopecoidea*, this species has its friable, inner band of its leaf sheaths closely cross-puckered." (ilpin)
Comments: Blooms 5-6. When the larger robust spikelets of *Carex stipata* are golden brown and shattering, *C. conjuncta* is green as a gourd. This species is rare in the trade, sourced for one nursery only. May be short lived. "Uncommon in wet places. It has a stem like the above (*C. alopecoidea)* but the sheaths are rugulose." (Fell 1955)

Carex conoidea Willdenow *IN, MD, MN, NC, OH OPEN-FIELD SEDGE, aka *Carex conoïde*, Cone-shaped Sedge, Field Sedge, Katahdin Sedge, Prairie Gray Sedge (*conoideus -a -um* cone-like, from Greek κωνος, *konos*, a cone, and οειδηος, *–oideos*, with the form of, like, resemble, for the somewhat conic perigynia.)
Habitat: Open wet meadows, fens, low prairies. Moist, open places. Moist, usually sandy, calcareous prairie concentrated near Lake Michigan, sometimes found with *C. aurea* (gccr). Wet meadows, wet prairies (rhm02). In New England grassy meadows and shores, usually in acidic sands or gravel (afne). distribution Frequent near Lake Michigan, occasional in the n. ½ of Illinois, also Massac Co. Uncommon throughout most of its range, most frequent in New England.
Culture: Seeds are highly dormant (≈90%), cold moist stratify or fall plant.
Description: general form Small sedge, tufted culms to 2.5' leaves 2-5.5 mm broad spikes terminal is staminate or barely with a few perigynia, lateral spikes 1-3, pistillate, staminate spikelet long-stalked pistillate scales green awned, scale 3 x 1.5 mm perigynia straw colored, cone-shaped, ovoid, with 16-20 (17-25) impressed nerves 3 x 1.5 mm key features ? rounded scales resembling those of *C. tetanica* (after Fasset). "The roots are fibrous or short-rhizomatous, culms are cespitose. All leaves are flat, narrow, and deep green. Perigynia are dark-green or brown, with impressed nerves, basally rounded, and loose about the achene. The achene is triangular, with concave sides, blunt angles, also is yellow-brown, granular, stipitate and apiculate. Versus *Carex crawei*, and *C. meadii*, this species has: 1) deep green, non-glaucous leaves 2) relatively long, rough-awned pistillate scales equalling or exceeding the perigynia 3) bunched culms." (ilpin)
Comments: Blooms 4-6. 466,119 seeds per pound. This species is rare in the trade, sourced for one nursery only This is the only species of the section *Griseae* that is regularly found in sunny habitats. "Quite uncommon. In Mulford Woods near the Forest Preserve and in Keith Creek Woods." (Fell 1955)
Associates: *Carex conoidea* is often found growing with *C. buxbaumii*, *C. tetanica*, and *C. pallescens.*

Carex crawei Dewey * CT, IN, KY, ME, NJ, NY CRAWE'S SEDGE, aka *Carex de Crawe*, Crawe Sedge, Dwarf Fen Sedge, Early Fen Sedge (After its discoverer, Ithamar Bingham Crawe, 1792-1847, New York physician.)
Habitat: Moist sandy, calcareous interdunal flats, usually near Lake Michigan, moist calcareous sand prairie, dolomitic pavement prairies of the lower Des Plaines River, moist calcareous prairies on the moraine, raised fen, marly fens, where it grows on the border of marl flats in the edge of the turf of the adjacent prairie fens (gccr). Sandy flats, calcareous prairies, fens (rhm02). In New England, calcareous shores, gravels, meadows, glades, quarries (afne).
distribution Occasional in the n. ½ of Illinois; also St. Clair Co.
Culture: 60 days cold moist stratification (pm 09).
Description: roots rhizomes long creeping pistillate scales 2 x 1 mm perigynia 3 x 1.5 mm N 2n = 38, 59, 60 key features "Solitary to loosely cespitose; thick and stiff leaves usually curved or achene enclosed in a beaked perigynium. recurved; terminal spike staminate overtopping the pistillate spike;" (ilpin)
Comments: Blooms 4-5. Fruiting 5 to 8. C3.
Though geographically widespread, this species is rare or local except near the shores of the Great Lakes, in glades in the Interior Highlands, and prairie swales in the Great Plains. Specimens from New York and Ontario have perigynia that approach *C. microdonta*. (fna)
Associates: One of four plants analyzed by Miller et al. (1999) were mycorrhizal, having hyphae and intra-radical spores. Seeds are dispersed by wind and water. Wind pollinated.

Carex crawfordii Fernald CRAWFORDS OVAL SEDGE, aka Crawford's Sedge (Early Fen Sedge?pm2009) (for Ethan Allan Crawford, early settler in the White Mountains of New Hampshire.)
Habitat: Degraded marsh (gccr). Degraded marsh (rhm02). In New England, open ground, wet or dry (afne).
distribution Very rare, Lake Co.
Culture: 60 days cold moist stratification (pm 09). Germination tests indicate this species is mostly nondormant, but will benefit from cold moist stratification.
Description: general form Similar to *C. tenera*; common plants, plants caespitose, slender culms 1-5 dm tall, without pseudoculms leave blades 1-4 mm wide heads spikelets all alike, short sessile spikes staminate flowers confined to tapering spikelet bases perigynia perigynia and scales lanceolate, 3-4.5X as long as wide, less than 2 mm, wide, about

1 mm wide, thin and scale-like, with translucent margins or wings, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity, wind dispersed stigmas 2. N 2n = 52, ca. 66, 70.
Comments: Blooms 5-6. In reference to the Lake County Illinois population, "heretofor, it had been recorded in the Lake Michigan region only from northern Wisconsin and Michigan, where it had been considered to be a relatively conservative species. Taft (1992) regarded this population and those disjunct in the Appalachians as boreal relicts. (gccr) Sounds a bit like *C. houghtoniana*. 2,203,888 seeds per pound

Carex crinita Lam. *IA CATERPILLAR SEDGE, aka *Carex crépu*, Fringed Sedge, Nodding Sedge (*crinitus -a -um* provided with long haired, covered with long hair, mane-like, hairy, from Latin *crinitus*, *crinis*, hair and *–itis*, provided with, for a hairy appearrance of the awned spreading scales.)
Habitat: Wet meadows, mesic savanna. Moist to wet soils, thickets, marshes, ditches, and streambanks. Swampy woods and thickets, unshaded peaty and marshy areas, hydromesophytic swamps behind the high dunes (gccr). Swales, damp thickets, and low woods. Swampy woods, marshes (rhm02). Moderate shade tolerance. Low drought tolerance. No salt tolerance. distribution Occasional throughout Illinois.
Culture: 60 days cold moist stratification (pm 09). Fall plant / cold moist stratify, or cold moist stratify / fall plant, light (Wade). Relatively reasonable germination with cold moist stratification for green house crops. 2004 seed tests reveal a lot with zero percent dormancy! Many, but not all lots we have tested have a low percent dormant seed. (gni)
Description: general form Abundant species, conspicuous or dominant in respective habitats roots plant often forming dense tussocks, but does not spread by elongate rhizomes, plants with abundant yellow root hairs, rhizomes lacking, 18" minimum root depth culms plants 1.0 to 4.0', bases often reddish and pinnate-fibrillose leaves long and slender sheaths smooth to rough, with minute rust-colored hairs heads inflorescence arching, with 3-9 slender, many flowered pistillate spikelets below several slender staminate spikes upper 1-2 spikes staminate or gynaecandrous; lower 2-6 spikes pistillate or androgynous, spikelets pendant; forma *crinita* has lowest 2-6 spikes entirely pistillate pistillate scales with long abrupt awns perigynia 2-3 mm long, perigynia round to ovoid, forma *crinita* has perigynia 2.0-3.5 mm long, often crimped on 1 side achenes flattened, bent stigmas 2 N 2n = 66, 68 key features "These plants have a stout aspect. The perigynia are short-beaked, brown-tawny-green, and anticularly-compressed. The staminate spikes are long-pedunculate, arching-pendulous. The pistillate scales are rough-long-awned, with hyaline margins. The achene are wrinkled or constricted on 1 side." (ilpin)
Comments: Blooms 5-8(?). Wetland restoration. 368,000 to 490,016 seeds per pound.
Associates: Provides food and cover for songbirds, ruffed grouse chicks, and moose.

Carex cristatella Britton CRESTED SEDGE, aka *Carex accrêté,* Crested Oval Sedge, Rosette Sedge, Round-Spikelet Sedge (*cristatellus -a -um* with a small tuft, a small comb, or a small crest, from Latin *cristatus*, bearing a crest, and *–ellus*, diminutive, for the widely spreading perigynia, which appear as tiny crests to some.)
Habitat: Seasonally inundated, wet meadows. Low, open ground, even in fairly disturbed wetlands, moist degraded meadows, degraded bogs (gccr). Agricultural drainage ditches, open swamps, shores; wet places in or near deciduous forests; prefers moist soil, may tolerate up to 6 inches of standing water. "A very common sedge, being found in nearly all wet places." (Fell 1955) In New England, meadows, damp woods, marshes, streambanks (afne). Forms dense patches in open places. Wet woods, marshes, swales, streambanks, ditches, meadows, bogs (rhm02). Nutrient load tolerance moderate. Siltation tolerance low. Tolerant of medium and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant, partial to full sun. pH 4.9-6.8. distribution Throughout Illinois, but more frequent in n. and w. cent. cos. Introduced in Europe.
Cultivation: 60 days cold moist stratification (pm 09). Easy from dry stored seed in greenhouse with no moist stratification, but occasional lots significantly benefit from cold moist stratification. Fall plant or cold moist stratify-light. (gni)

Spreads quickly from fresh seed. In mixes plant up to 0.125 lb pls per acre. (USDA 1997) Growth rate moderate. Seedling vigor low. Vegetative spread rate none. Spreads slowly by seed.
Description general form Common sedge, plants caespitose, slender, stout, tufted roots 8" minimum root depth. culms 1.5-2.5', somewhat larger plants with slender pseudoculms, aphyllopodic leaves 2-10 mm wide spikes most have pistillate flowers at the apex, spikelets 6-15 per culm, globose, hard, prickly, all alike, short sessile, becoming pinkish brown, staminate flowers confined to tapering spikelet bases; in forma *cristatella,* all the spikelets are contiguous perigynia less than 2 mm wide, 3-4 mm long, (3.5 x 1.5 mm, beak 1 mm) rhombic, twice (rarely 3X) as long as wide, broadest above the achene tip, slenderly lanceolate. thin and scale-like, with translucent crinkly margins or wings, divergent to slightly reflexed wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 70 key features "Perigynia wing-margined, lower part firm, without spongy thickening; plants mostly cespitose, sans well-developed rhizomes. Mature perigynia ovoid to suborbicular, less than or equal to 2 1/2 times longer than wide; spikes globose, mature perigynia beaks spreading-recurved; wing abruptly narrowed below middle, thus, base wingless - sterile culms with spreading non-clustered leaves common. Field ID - crowded, nearly globose spikes with perigynia wide-spreading; and by numerous spreading leaves on the numerous sterile culms." (ilpin) "When mature, *Carex cristatella* is readily distinguished from most other

species of sect. Ovales by the widely spreading perigynia and the globose spikes, but immature specimens are frequently mistaken for other species, especially *C. bebbii*." (fna)
Comments: Blooms 5-7. Wetland restoration, good pioneer species for upper shoreline and vegetated swales. Seeds are eaten by waterfowl. 928,000 to 2,647,230* seeds per pound.

Fourteen of fifteen plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, hyphae, and intra-radical spores.

Carex crus-corvi Shuttlew. ex Kinze (or just Shuttlew., or Kunze?) *MI, OH, WI CROWFOOT SEDGE, aka Crow-Beak Sedge, Crowfoot Fox Sedge, Crow-Spur Sedge, Ravenfoot Sedge, Ravens-Foot Sedge (Latin *crus*, leg or thigh, and *corvus*, raven, for the spurred appearance of the perigynia.)
Habitat: Upland swamp, swampy woods and meadows, rare. A slough and river bottom plant. Rare species of upland swampy depressions on the moraine (gccr). Swamps, wet woods, especially pin oak woods, upland swampy depressions (rhm02). Tolerant of medium and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 3.5-7.0. distribution Occasional in the s. ½ of Illinois, becoming less common northward. A species of the Mississippi drainage and the Coastal Plain.
Culture: 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify-light. (Code C, D Ken Schaal). Cold moist stratification is best for a good green house crop. Dormancy levels may swing widely from year to year. (gni). Growth rate moderate. Seedling vigor medium. Vegetative spread rate slow. Spreads slowly from seed.
Description: general form Conspicuous in fruit culms very stout, densely clustered, narrowly winged, shorter than the leaves, 1.5-3.0' sheaths thin and truncate at the mouth, not corrugated perigynia with a *bulbous thickened base* N 2n = 52 key features "Inflorescence basally, sometimes obscurely branched; spikelets not sessile; foliage from glaucous gray or bluish green to deep green. Good distinguishing features are: 1) compound, much branched inflorescence with elongate lower branches, and 2) very elongated perigynium beak. In aspect - robust, large, in leaves and in compound head." (ilpin)
Comments: Blooms 5-8. Wetland restoration. Occasionally *C. stipata* plugs are sold as *C. crus-corvi*. 150,000 to 351,938 seeds per pound. "This has been credited to the county by Bebb and others but it is not known to us." (Fell 1955)
Associates: Possibly partially insect pollinated. Native Lady Bugs work the inflorescences during pollination.

Carex davisii Schweinitz & Torrey *CT, MD, MA, MI?, MN, NY, TN AWNED GRACEFUL SEDGE, aka Davis' Sedge, Terrace Sedge (Named for Emerson Davis, 1798-1866, Massachusetts educator and caricologist.)
Habitat: Uncommon, mesic to moist woods, wooded floodplains, bottomland terraces, mesic to moist woods. "Common in upland and lowland woods." Beech maple forests, high wooded terraces along floodplains, bottomland terraces (gccr). Basswood elm woodlands, rich wooded slopes in ravines and valleys (ilpin). Moist woods, dry woods, wet ditches (rhm02). In New England, rich calcareous, deciduous woods, meadows, shores (afne). distribution Occasional to common throughout Illinois.
Cultivation 60 days cold moist stratification (pm 09). Easy in greenhouse with long, cold moist stratification. Unstratified seed germinates 4-8%.
Description: culms dark maroon at base spikes terminal gynaecandrous, laterals (2-3) pistillate pistillate scales 7.5 x 2.5 mm, awn 3.5 mm perigynia 5 x 2.5 mm key features "This species is characterized by: 1) dark rootstocks, pubescent leaf sheaths and lower surfaces of leaves 2) narrowly cylindric pistillate spikes; 3) triangular achene with concave sides, blunt angles that are loosely enveloped by the perigynium, substipitate and apiculate. Early on, pistillate spikes are erect, but may become nodding-spreading. Early on, the perigynia are pale green, but become brown to yellow-brown." (ilpin)
Comments: Blooms 5-6. 144,000 to 288,303 seeds per pound. "A common sedge mostly of low woods. The disposition of the perigynia and scales in the spikes varies to such a degree as to at times suggest *C. formosa* Dew. which we have not found here." (Fell 1955)

"A southern form?" resembles *C. amphibola* (*grisea)* with the spikes being cylindrical, but not stiff, Long awned scales give spikes a "woolly caterpillar look". It is our only sedge with hairless peryginia and hairy leaves.

Carex eburnea Boott *In, ME, MD, NH, PA EBONY SEDGE, aka Bristle-Leaf Sedge, *Carex ivoirin*, Hairy-Leaved Sedge, Ivory Sedge (Latin *eburneus*, made with ivory, of ivory, for the whitish scales against the blackish perigynia. From *ebur, eboris*, an object or statue of ivory, or an elephant or elephant tusk, perhaps from *e-*, prefix meaning from, and *barrus*, elephant.)
Habitat: Dry to damp limy shores, usually under red or white cedars. Rock Cut State Park, Apple River Canyon. On shaded dolomite in White Pines State Park with *C. pedunculata***.** Calcareous slopes near Lake Michigan, Lake Michigan ravines, high dunes of Lake Michigan, edge of a panne, low sand ridges near Lake Michigan (gccr). Calcareous slopes and ravines with Sugar Maple, Basswood, and Red Oak (ilpin). Calcareous ledges, wooded ravines (rhm02) distribution Occasional in the n. ½ of Illinois, and in counties along the Mississippi River.
60 days cold moist stratification (pm 09).

Description: general form Early minute northern sedge, small tufted, forming low mats, 5-15 (54) cm tall, plant bases brown to red purple leaves 0.1-1 mm wide spikes subterminal spike is entirely staminate or at most with a few perigynia lateral spikes 2-4, pistillate, staminate spikelet 1, hidden among 2-3 pistillate spikelets perigynia minutely pubescent, with only 2 ribs, triangular, light green becoming black, persistent into winter, 1.5-2.2 mm long x 0.7-1.1mm; beak 0.2-0.4 (-0.5) mm achenes ellipsoid-obovoid stigmas 3 key features "Identification by over wintering perigynia is usually possible." (Fell 1959) "1) Aspect; 2) spikes - female spikes erect, ascending, somewhat spreading; sessile to pedunculate; 3) leaves, sheaths, bracts - basal leaves less than 10 mm wide. Leaves capillary, 0.5 mm wide; 4) scales and perigynia - perigynia beakless, or beak less than 0.5 mm l. Perigynia 2 mm l.; 5) achenes." (ilpin)
Description/comments: Flowering 4-6. 832,000 to 1,333,333 seeds per pound. Nonmycorrhizal.

Carex emoryi Dewey ex Torrey (or just Dewey) EMORY'S SEDGE, aka Riverbank Sedge (After Maj. William Hemsley Emory, 1811-1887, U.S. Army officer who collected plants while on missions. He was Director of the Mexican Boundary Survey and, in 1843, was made an assistant in the Topographic Bureau in Washington. He also helped survey the boundary between Canada and the ne USA, and the Gasden Purchase.)
Habitat: Stream margins and swales with flowing water, wooded river floodplains, Mesophytic ravine bottoms, sedge meadows, open depressions in oak savanna (gccr). Wet ground species. Along streams, sedge meadows (rhm02). In New England, swamps, shores, most often in basic or calcareous waters (afne). distribution Occasional in the n. 2/3 of Illinois; also Johnson, Randolph, and Union cos.
Culture: Cloning. Probably self-incompatible.
Description: general form Abundant species (or uncommon according to Fell 1959), conspicuous or dominant in respective habitats roots plant often forming dense tussocks, also spread by elongate rhizomes culms similar to *C. stricta,* but pinnate fibrils lacking, plants 30-150 cm tall; bases often reddish leaves hypostomic, long and slender; Leaves to 6.5 mm wide. ligules less high than wide or straight across; *lowest leaves reduced reddish-brown, bladeless sheaths* sheaths ligule very short, truncate, or forming shallow arc heads inflorescence arching, with 3-9 slender, many flowered pistillate spikelets below several slender staminate pistillate scales 3 x .75 mm perigynia 2-3 mm long, or 2.5mm x 1.5mm, with 3 distinct nerves achenes flattened stigmas 2 N 2n = 72 key features "Its distinction from *C. stricta* is marked, but distinction requires examination of the ligules" (gccr). "*Carex emoryi* resembles *C. aquatilis* in size and habit, and has similar sheaths and spike dimensions. It is distinguished by the finely veined perigynia, the prolonged convex sheath apex and truncate ligule, and the hypostomic leaves. Most specimens identified as *C. aquatilis* var. *altior* are *C. aquatilis*; the type of *C. aquatilis* var. *altior* is an immature specimen of *C. emoryi*." (fna)
Comments: Inflorescences emerge in mid-April. Blooms 4-6. Much like *C. haydenii*, not easy to ID. Sheath characteristics and high chromosome number suggest *C. emoryi* is not in the *C. stricta* subgroup. 2,250,000 to 3,200,000 seeds per pound. "This and the preceding (*C. stricta)* and the following (*C. haydenii*) are so similar as to make separation difficult. This has stouter culms and the lower sheaths are not fibrillose are purple. Uncommon, Kent Creek at Cunningham road west of Rockford." (Fell 1955)

The *emoryi* is always greener over the septic field.

Carex festucacea Schkuhr ex Willdenow (or just Schkuhr) *MI FESCUE SEDGE, FESCUE OVAL SEDGE (New Latin, from classical Latin *festūca*, popular Latin *festūcum*, the name for a stalk of grain, stalk, stem, straw, and *–aceus*, suffix denoting of the nature of, belonging to, for its resemblance to straw or grass; some sources translate this as a resemblance to fescue, but *au contraire*, mooseface.)
Habitat: Uncommon species of mesic prairies and open savannas, wet mesic prairie (gccr), marshes, woods, low grounds. Prairie. Moist prairies, moist savannas, low woods (rhm02). In New England wet or seasonally wet places, low woods (afne). distribution Scattered in Illinois, but apparently more frequent in the n. ½ of Illinois.
Culture: Cold moist stratify, light. (Code C, D Ken Schaal).
Description: general form Common prairie sedge, tufted sheaths aphyllopodic pistillate scales scale 3.5 x 1 mm perigynia 4 x 2 mm, beak 1.5mm N 2n = 68, 70 key features "One of the surest ways of separating this species from similar ones, such as *C. longii* and *C. absolutescens*, is the distance from the base of the perigynia to the widest part; for the latter two species this distance well exceeds 1.2 mm (gccr).
Comments: Blooms 4-6. Similar to *C. absolutescens* and *C. longii*. 576,000 to 1,072,000 seeds per pound. "A common sedge which is usually found on prairies. All the spikes have prolonged clavate bases thus differing from *C. tenera* which also has a moniliform head." (Fell 1955)

Carex flava Linnaeus LARGE YELLOW SEDGE, aka Yellow Sedge (*flavus -a -um* pure yellow; pure, pale yellow, from Latin *flavus*, yellow**,** for the color of the mature perigynia.)
Habitat: Marly marsh, wet prairie in the Indiana Dunes region (gccr); coniferous forests, bogs, meadows, and wet sand or marl. distribution Unknown in Illinois.
Description: Perigynia 3.5-6 mm long, becoming yellow or orange, 8-18 nerved, with conspicuous straight to decurved beaks and brown scales.

Description/comments: Blooms 5. This is one of two Carex species with short cylindrical pistillate inflorescence with the basal perigynia angled retrorsely. 494,284 seeds per pound. Cullina (2008) notes *C. flava* as ant-dispersed.

Carex frankii Kunth *MI BRISTLY CATTAIL SEDGE, aka Frank's Sedge (after Joseph C. Frank, 1782-1835, German botanist and physician who travelled and collected in the United States)
Habitat: Wet meadows, wet savanna. Moist woods, streambanks, low marshy ground, and ditches (ecs). Moist wooded areas, stream terraces, along stream banks (gccr). Wet woods and swamps. Moist woods, along streams, wet ditches (rhm02). Along Kankakee River in Will County. Shade tolerant. Low drought tolerance. No salt tolerance. pH 5.9-7.2. distribution Common to occasional throughout Illinois, except for the northmost tier of cos. (rhm02)
Culture: Fall plant or cold moist stratify, light (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09). Good greenhouse crops can occasionally be grown without stratification (gni). 2004 seed tests revealed a lot with zero percent dormancy, however this species has wide reversals in dormancy mechanisms from year to year, with germination as low as 2-6% without cold moist stratification. Cold moist treatment is insurance.
Description: roots rhizomatous? 9" minimum root depth culms to 2' spikes terminal spike male, may have 1-2 perigynia on top; occasionally absent or aborted (ref. 2); lateral spikes 3-7, pistillate key features grows in small tufts on fairly short rhizomes, aphyllopodic, 1.0-2.0'. "This is a stout, large plant. It is readily identified by: 1) long, leaf-like bracts (2-4 times length of inflorescence); 2) very rough, long awns of the pistillate scales; 3) widely spreading perigynia which are broadest nearest the summit." (ilpin)
Comments: Flowers from 5-9. Wetland restoration, bunching, ornamental. 427,294 to 496,990 seeds per pound. Seems to be somewhat slower than other carices in coming into seed production. George Milner at V3 reports this fairly reliable from seed in the field.

Carex glaucodea Tuckerman BLUE SEDGE (*glaucodeus -a -um* from Latin *glaucus -a -um,* bluish-gray or greenish-gray, from Greek γλαυκός, *glaukos,* silvery, gleaming, or bluish-green or gray, and *-oides*, with the form of or a resemblence, for the strongly glaucous foliage)
Habitat: Woods (rhm02). Wooded slopes over bedrock soils, ridges and ravines. distribution Occassional in the s. ½ of Illinois, absent elsewhere. Adventive in a oldfield in Porter Co. Indiana.
Culture: Available from Chesapeake Native Nursery.
Description: spikes Terminal spike staminate, or barely with a few perigynia. Lateral spikes usually 4, pistillate key features "A plant of dry places. Leaves flat, very glaucous. Staminate spike inconspicuous, mostly sessile or short-peduncled, often exceeding topmost pistillate spike. Pistillate scales less than or equalling 1/2 length perigynia, acuminate to short-awned. Perigynia beakless, slightly emarginate, ellipsoid. Achene triangular, concave sides, blunt angles, stipitate, bent-apiculate. In the field, this plant is recognized by its thick, glaucous leaves lasting through the winter months." (ilpin)
Comments: Blooms 5-7. It has been reported from Lake County, Indiana several times, but the reports are probably all based on a specimen of *C. granularis*.

Carex gracilescens Steud. SLENDER LOOSE-FLOWERED SEDGE, aka *Carex grele*, Slender Wood Sedge, Slender Sedge (*gracilescens* becoming slender, becoming graceful, Latin *gracilis*, slender, thin simple, and *–escens*, beginning to or becoming, for the elongate lower pistillate peduncles.)
Habitat: Degrading Lake Michigan bluff mesic woodlands and mesophytic dune savannas near the lake in Indiana (gccr). Moist or dry woods (rhm02), Often in calcareous soils. distribution Occasional in the n. ¼ of Illinois, also Alexander, Jackson, and McDonough cos.
Culture: Species in the *C. laxiflora* group are reported to be hydrophilic seeds. (Cullina 2008).
Description: Much like *C. blanda*, but less common. Perigynia 3 x 1 mm 2n = 33, 38, 40.
Comments: Blooms April – June. *This species is not in the seed trade and is not commercially available and should not be included in job specks.*

"Not uncommon in large or small tufts along shady roadsides and the edge of woods. Not as common as *C. blanda* which it resembles. (*C. laxiflora* var. *gracillima* Boott)" (Fell 1955)

"On the Valpariso Moraine on lake bluff regions west of Lake Michigan, this species persists in mesophytic woodlands which once were more savanna-like. It was probably a principal fuel matrix species, along with *Carex hirtifolia*, *C. jamesii*. *C. pensylvanica*, and *C. rosea*." (gccr)

Carex gracillima Schweinitz GRACEFUL SEDGE, Purple-Sheathed Graceful Sedge (Latin *gracillimus -a -um,* most slender or very slender, for the elongate slender pistillate spikes)
Habitat: Frequent woodland species, mesic woods, wet swamps, beech maple forests (gccr). "A woodland sedge that is found much more frequently in Stephenson and Dekalb counties than in Winnebago County." (Fell 1955) Irregular distribution, plentiful in some woods, absent from others (Fell 1959).
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). Genesis Nursery seed test data is limited, but indicates cold moist stratification is required for many lots.

Description: culms Plant base red purple leaves abundant, dark green, M-shaped, 4-11 mm broad, evergreen sheaths older leaf sheaths minutely hairy and fine red-dotted heads terminal spikelet with some perigynia at the tip spikes perigynia appressed staminate scales 2 x 1 mm perigynia beakless, bluntly 3-angled, 2.5-3 mm long (3.5 x 1.5 mm), 6-20 nerved, green, ellipsoidal, blunt.
Comments: Blooms 4-5. Unusual woodland sedge. 441,205 to 462,322 seeds per pound.

Carex granularis Muhl. ex Willdenow LIMESTONE MEADOW SEDGE, aka Meadow Sedge, Pale Field Sedge, Pale Sedge (Latin *granulus*, a small grain, and *–aris*, pertaining to, for the spikelets resembling clusters of grains)
Habitat: Wet meadows, old fields, open woodlands, uncommon, shaded hillside seeps, moist old fields wet open calcareous meadows, raw marl, wooded cliffs. Flat woods and fen species. Open calcareous ground near Lake Michigan, calcareous fens, disturbed woods, moist old fields (gccr). Prefers moist soil. Tolerates 1" of standing water for short to moderate (Clean water) times. Potential seed bank species. pH tolerance not available. Nutrient load tolerance low to moderate. Salt tolerance low. Not siltation tolerant! Partial to full sun. Wilhelm, 1991 lists this species in the Alluvial community. Wet ground, irregularly distributed. Woods, old fields, fens, wet meadows (rhm02) distribution Common throughout Illinois (rhm02) "Abundant where found but less frequent than the next (*C. haleana*). Kishwaukee River slough near Killbuck Forest Preserve." (Fell 1955)
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). Fall plant or cold moist stratify, light. Some say germination is best from fresh seed, but works well from dry stored seed with cold moist stratification (gni). I have seen no references to this species having hydrophilic seed. Genesis Nursery seed tests show low germination (1-11%) without cold moist stratification. In seed mixes plant up to 0.31 pls lbs per acre (USDA 1997)
Description: general form Similar to *C. blanda* roots cespitose sedge culms 0.5-2.0' leaves blue-green spikes the typical variety has pistillate spikes 5-6 mm thick pistillate scales 2 x 1 mm, speckled perigynia crowded, only slightly asymmetrical, broadest below middle, or ellipsoidal, 3 x 1.5 mm, OR 2.5 x 1.5 mm (Fell) or 2.3-3.0mm long by 1.0-1.5mm wide (Mohl.), blue green, only 20 nerved. The typical variety has perigynia strongly inflated, ovoid to subglobose, 2.5 mm-4.0 mm long, 1.5-2.5 mm wide key features Similar to *C. blanda*, but leaves blue-green.
Comments: Blooms 5-6. Wetland restoration, useful in partially shaded upper shoreline zones, bunching, calcareous. 256,000 to 428,504 seeds per pound.

Five of ten plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles and vesicles.

"*C. haleana* (Olney) Porter. Kent Creek bottom on North Springfield avenue road; Killbuck Creek at U.S. Rt. No. 51. Conspicuous in early spring because of its thick overwintering leaves. (*C. granularis* var. *haleana* (Olney) Porter)" (Fell 1955)

Carex gravida L. H. Bailey *MI HEAVY SEDGE, aka Coarse Field Sedge, Long-Awned Bracted Sedge (*gravidus - a -um* Latin *gravidus*, fecund, heavy with young, for the fertile looking clusters of spikelets.)
Habitat: Disturbed partially shaded areas, old fields, disturbed moist meadows, dry prairies (gccr). Sand prairies, dry savanna; and roadsides. Prairie roadsides. Dry prairies, old fields, disturbed meadows (rhm02) "Common in high prairie areas." (Fell 1955). distribution Scattered throughout Illinois.
Cultivation Fall plant or cold moist stratify, light (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09). GNI seed test data indicate good germination (70-87%) is possible in some lots without cold moist stratification.
Description: general form Common sedge roots plants caespitose culms to 1.5 m tall; 1.5-3.0' leaves 5-8 mm wide spikes spikelets short, sessile; staminate flowers at apex of each spikelet, a tiny club-shaped mass of whitish scales remaining after anthesis; spikelets aggregated pistillate scales red tinged, 4 x 2 mm perigynia plano-convex, ovate, 3-5.5 mm long (4.5 x 2 mm) (average 4.3 mm, Swink, 1990) nerveless on flat face, red tinged. Remaining green marginally, the body pale, becoming straw-colored or brownish above *the spongy base,* essentially nerveless on both faces (gccr) stigmas 2.
Comments: Blooms 5. Bunching 228,571 to 309,686 seeds per pound. "Noticable because of its long stiff spreading stems and oblong heads. " (Fell 1959)

Two of two plants analyzed by Miller et al. (1999) were mycorrhizal, having hyphae, and intra-radical spores.

"*C. lunelliana* Mack. Not a very convincing species and not recognized by Jones. The beak and scale awns are shorter than in *C. gravida* and the leaves are wider. On Mulford and Penfield roads and other prairie areas east of Rockford." (Fell 1955)

Carex grayii J. Carey BUR SEDGE, aka Common Bur Sedge, Gray's Bur Sedge, Gray's Sedge, Morning Star Sedge, (after Asa Gray, 1810-1888, botany professor at Harvard, author of Gray's Manual of Botany.) (also spelled *grayi)*
Habitat: Wet savannas and mesic woodlands. Alluvial terraces and backwaters, upland swamps, open lowland flats (gccr). Deciduous floodplain forests along major rivers. Also known from a closed canopy Black Oak-Black Maple-Tulip Poplar woodland on the east bluff (upland) of Bureau Creek, north of Princeton. Wet woods, in floodplains, along streams, wooded swamps. (rhm02). Shade tolerant. Low drought tolerance. No salt tolerance. distribution Common throughout Illinois.
Culture: Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). Fall planting in cold frame in fall and bringing into greenhouse works well with germination extending well into late June. Sown in greenhouse without moist stratification also gives very limited, prolonged germination. Genesis seed test data indicate

low germination (4-24%) without cold moist stratification. The perigynia should be removed for greenhouse propagation. The achene of this species is large and has a thick seed coat, which Wolfgang Schütz (2000) suggests as a contributing cause of physiological dormancy.
Description: general form Similar to *C. lupulina* and *C. intumescens,* bunching roots 8" minimum root depth. culms 1-3' heads seed heads are persistent spikes staminate spikelet sessile pistillate scales 8.5 3 mm perigynia shaped like 2 cones fitted base to base; 18 x 7 mm, beak 3 mm, teeth 2 mm, achene 5 x 3 mm, numerous and crowded into 1 or 2 globose spikelets, rarely pubescent key features Similar to *C. lupulina* and *C. intumescens,* but staminate spikelet sessile.
Comments: Blooms 5-7. Attractive cut flowers or dried seed heads. Wetland restoration, landscaping. This species is sold as an ornamental for shade by some ornamental grass growers. 17,804 to 37,715* seeds per pound.

"Very uncommon. In wet woods in Sugar River Forest Preserve and in Pecatonica River sloughs in both Winnebago and Stephenson counties." (Fell 1955)

Carex grisea Wahlenb. GRAY SEDGE, Eastern Narrow-Leafed Sedge, Inflated Narrow-Leaf Sedge, Wood Gray Sedge (*griseus -a -um, grisëus* gray, or pure pearly gray, perle-grey, somewhat grayish, from medieval Latin *grīseus*, grey, pearl grey, pure grey a little verging to blue)
Habitat: Mesic woodlands, moist wooded slopes, low woods and terraces, moist or alluvial deciduous woods. One of the dominant sedges of the Box Elder barrens, co-dominant with *C. Jamesii* and *C. Davisii*. Low woods and terraces, associating with *Acer negundo*. Calcareous springy slopes, ditches, volunteers in partially shaded parks and picnic areas (gccr92). Low woods, roadside ditches (rhm02). In New England rich, deciduous woods, bottomlands, woods (afne). distribution Common, throughout Illinois.
Culture: Fall plant, cold moist stratify. Seeds are highly dormant (1-10% germ w/o cold moist stratification). 60 days cold moist stratification (pm 09). Longer stratification may be indicated.
Description: general form More erect and robust than *C. blanda* culms 0.5'-1.5' bases brown to reddish leaves dark green, evergreen pistillate scales 6 x 1.5 mm, elongate tapering, dark-speckled or streaked perigynia 4-5.2 mm long (5 x 2.5 mm), beakless, symmetrical, ovoid or barrel-shaped, terete or slightly triangular, 30-50 nerves impressed rather than raised.
Comments: Blooms 5-7. Calcareous, bunching. 91,625 to 182,549 seeds per pound. "A common sedge usually found in the edge of woods but also in the open in roadside ditches. Not so common in the sand areas. (*C. amphibola* var, *turgida*)" (Fell 1955)

Possibly partially insect pollinated. Native Lady Bugs work the inflorescences during pollination.

Carex hirsutella Mackenzie FUZZY WUZZY SEDGE, aka Hairy Green Sedge, Hairy-Leaved Sedge, Hairy Savanna Sedge, Hirsute Sedge (*hirtsutellus -a -um* Latin *hirsutus*, hairy, and *–ellus*, diminutive, covered with tiny hairs, for the leaves covered with tiny hairs)
Habitat: Dry woods, sterile situations, in areas having a history of great disturbance (gccr92). Dry woods, fields, dry meadows (rhm02). In New England, open woods, meadows, fields, in neutral to basic soils (afne). distribution Common throughout Illinois except apparently absent from the nw. cos.
Cultivation Cold moist stratify, light (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09). Fall plant in cold frames works well. Seed tests indicate the seed is predominately dormant.
Description: sheaths lowest dark reddish brown, and white nerved, *bladeless,* becoming greenish and hirsute upwards, and quickly with well-developed leaves(gccr) N 2n = 52 key features terminal spikelet pistillate at summit, pistillate scales obtuse to short-apiculate, shorter than the perigynia.
Comments: Blooms 5-6. 288,000 to 456,000 seeds per pound.

Carex hirtifolia Mackenzie HAIRY SEDGE, aka Hairy Wood Sedge, Pubescent Sedge (*hirtifolius -a -um* with hairy leaves, from Latin *hirtus*, rough, hairy, and *folium*, leaf, for the hairy leaves.)
Habitat: Savannas, hill prairies-oak openings, common, in rich woodlands. Dry or mesic woods Maple-basswood forests. Morainal savanna woodlands and Beech maples woods (gccr92). "A common early woodland sedge." (Fell 1955) Generally distributed in damp woods and less commonly in dry woods (Fell 1959). Dry or mesic woods (rhm02). In New England rich woods and meadows, often calcareous (afne). distribution Common throughout Illinois.
Cultivation Fall plant or cold moist stratify, light.
Description: general form Small tufted sedges, loosely bunched, soft hairy leaves and stems. culms 0.8-2.5' tall. Plant bases brown to red purple leaves pale green hairy flaccid, 5-10 mm wide spikes terminal spike entirely staminate, staminate spike 1 sessile or nearly so pistillate scales 4.5 x 1 mm, awn 1.5 mm perigynia minutely pubescent, with only 2 ribs, densely hairy triangular seed sacks, broadly ellipsoid, 3.5-5 mm long, (4 x 1.5 mm), teeth of the beak minute. achenes 3-sided stigmas 3 reddish brown N 2n = 50.
Comments: Flowering 4-6. 340,200 seeds per pound. The most pubescent native carex in Illinois. Resembles a dark green, hairy *C. blanda.*

Carex houghtoniana Torrey ex Dewey *NY *(*In some texts, this is "incorrectly corrected" to *C. houghtonii)* HOUGHTON'S SEDGE, aka *Carex de Houghton*, Houghton's Wooly Sedge, "Friday The 13th Sedge". (According to Voss, this sedge is named after Douglass Houghton, 1809-1845, who discovered the sedge on Friday the 13th, July, 1832, on sandy jack pine ridges near Lake Itasca, shortly before he and Henry Rowe Schoolcraft first visited that lake, the source of the Mississippi River)
Habitat: Dry open sand. Sandy, gravelly, or rocky open ground, ranging from moist (shores, swampy woods borders, and clearings); very dry (jack pine plains, sandy blowouts, dune ridges). Often in disturbed sites... roads and railroads (Voss). In New England dry, acid sands and gravels, rocky openings (afne). Nursery waif in Illinois, sandy oldfield, recently cropland. This species may form part of a long term upland seed bank and will occur in areas where mineral soil has been exposed by fire or other disturbances such as soil scraping. distribution Native to northern Wisconsin, Michigan, Minnesota, and Whiteside County, Illinois.
Culture: Clone at the least. Greenhouse sown without moist stratification yields nothing. 90-120 days cold moist stratification or fall plant in permanent location may work.
Description: general form Plants similar to *C. pellita,* but in early stages larger roots medium sized rhizomatous sedge culms basal reddish, with numerous short pseudoculms leaves blades green, M-shaped, 3-4.5 mm wide; sheaths *basal sheaths reddish purple, bladeless,* with pinnate fibrillose sheaths spikes staminate spikelets 1-3; pistillate spikes 1-3, ascending, remote, 1-4 cm long pistillate scales often minutely fringed on margins perigynia small, globose, pubescent 5-6 mm long, 2-3 mm thick, w/ coarse hairs and 10-16 prominent nerves, sometimes reddish when ripe (description mostly after Fassett) stigmas 3.
Comments: Spreading by strong rhizomes, forming weak, open sod. As a young plant during good years it is very striking in fruit, a kind of in your face kind of sedge, visible from 75 feet. As a mature plant, it is unremarkable and easily overlooked, with widespread fertile and vegetative culms. 72,900 seeds per pound. Seed source nursery production from disjunct population. Observed in bloom April 19, 2005.

Our population was identified by A.A. Reznicek. Another taxonomist called our population one of those un-named troublesome *Carex pellita* hybrids, which leads us to believe some of the clonal hybrid *Carex* mentioned in Swink and Wilhelm (1994) should be re-examined. It may prove to be more common than is thought. In the Flora of North America, there is now a dot for *Carex houghtoniana* in Illinois, and if you look very closely, it is in Whiteside County.

Carex hyalinolepis Steudel *MI DITCH SEDGE, SHORELINE SEDGE, SEDGE (*hyalinolepis* transparent scales, from Latin *hyalin-us*, from Greek ὑάλινος, *hyalinos,* of glass or crystal, and Greek λεπίς, *lepis,* scale or flake.)
Habitat: Calcareous or brackish swamps, swales, and shores, native south and east of our area. Reputedly adapted to urban hydrology. Wet ditches and swamps (rhm02) distribution Occasional to common in the s. ½ of Illinois, apparently absent elsewhere. This sedge also occurs on the east coast, in oligohaline environments.
Culture: 2-3 months cold moist stratification yields less than moderate germination. (gni)
Description: roots long creeping rhizomes culms phyllopodic key features Plants similar to *C. lacustris*, but with whitish to pale brown blade bearing lower sheaths, rarely fibrillose.
Comments: Extremely aggressively rhizomatous, forming extensive sterile stands. Almost nonexistant seed production after 3 years in our plot which was established from seed grown plugs, which in 2002 produced one seed stalk, but flowering and fruiting abundantely in 2003 (see also *C. utriculata*). Surprisingly fertile for a strongly rhizomatous species. 160,000 (gni) seeds per pound. Could be of value in urban erosion control projects, regardless of its nativity.

Blooms April-July. Our colony flowers late April to mid-May.

Some references to this plant in the Chicago region are referred to *Carex acutiformis.* A native nursery offers this species in a shoreline seed mix.

Carex hystericina Muhlenberg ex Willdenow BOTTLEBRUSH SEDGE, aka Bladder Sedge, Porcupine Sedge (*hystericina* Greek *hystrix*, porcupine, and *-inus*, belonging to, for the bristled spike's resemblance to a porcupine)
Habitat: Fens and agricultural drainage ditches; calcareous; common in slightly disturbed wet meadows, and on sandy or marly shores. "frequent species in its limited habitat, the calcareous fen… and more disturbed areas such as ditches" (gccr92). Very common in sloughs, ditches, and other wet places. (Fell 1959) Swamps, calareous fens, wet ditches (rhm02). In New England swamps, shores, meadows, seeps, mostly in calcareous soils (afne). distribution Occasional to common in the n. 2/3 of Illinois
Culture: Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). In greenhouse no treatment is needed for an adequate crop, though some lots significantly benefit from cold moist stratification. An occasional lot may be non-dormant. (gni) Fall plant or cold moist stratify-light.
Description: general form Robust roots caespitose culms 0.5-2.5' (5-30 cm) very variable in size, bases red, pinnate fibrillose leaves 3-10 mm wide heads staminate spikelets 1-3 above clustered, stalked, erect, or drooping pistillate spikelets that are thick-cylindrical pistillate scales abruptly narrowed near base(?) into a long awn (scale 4 x 1 mm, awn 2.5 mm) perigynia inflated, numerous, divergent, lanceolate-ovoid, 13-20 nerved, 5-7 mm long, 1.6-2 mm thick,

(6.5 x 2 mm, beak 2.5mm, teeth 0.5 mm) delicate, pale green to straw-colored achenes broadest above the middle, 1.5 x 1 mm stigmas 3.
Comments: Blooms 5-7. 307,068 to 525,463 seeds per pound. The peryginia remain green as the fruit matures and shatters.

"Common and variable as to height. Ditches, sloughs, and other wet places." (Fell 1955)

Carex interior L. H. Bailey INLAND SEDGE, aka Dwarf Tufted Fen Sedge, Inland Star Sedge, Prairie Star Sedge (Latin *interior*, inner or interior, for its inland provenance) Not providence like the dipsticks say.
Habitat: In Tamarack bogs, more common in calcareous meadows, also moist prairies (gccr92). Wet peaty places; Mostly in wet very acid or very alkaline soils in the sun. Always in very wet open places. (Fell 1959). Bogs, wet meadows, moist prairies, wet woods, swamps (rhm02). In New England swamps, shores, meadows, seeps, often in calcareous soils (afne). 2,000-4,500' "low acid tolerance, medium salinity tolerance." (Rainier) distribution scattered throughout Illinois.
Culture: 60 days cold moist stratification (pm 09). Alone plant 1-2 lb/acre in fall or spring (Rainier) Fourth Corner Nursery.
Description: general form Plants small, slender, tufted roots caespitose culms 13-24" leaves 1-3 mm wide heads spikelets usually 3 (2-5) per culm spikes spikelets all similar, sessile, as broad as long, with staminate scales at bases; scales rounded ? pistillate scales 1.5 X 1.5 mm perigynia ovate, tapering to a short beak, almost nerveless on flat inner face, 1-2 (1.25) mm wide and 2-3.5 (2.25) mm long, green or yellowish perigynia divergent or reflexed, giving spikelet a star shape when viewed from above key features Key characteristics are its resemblance to *C. sterilis*, differing in having only 2-3 spikes. The similar *C. rosea* and *C. radiata* are always in woods. (Fell 1959)
Comments: Blooms 4-5. Bunching habit, good erosion control, good wildlife values, satisfactory forage values. 608,000 to 624,000 seeds per pound. "It resembles C. rosea but it is less robust and it always grows in boggy places. Rather frequent in Coon and Kent Creek bottoms. Usually abundant where found." (Fell 1955)

C. interior is considered nonmycorrhizal and has bulbous-based root hairs. The unusual root hairs may represent an adaptation for nonmycorrhizal growth. (Miller et al. 1999) None of three plants analyzed by Miller et al. (1999) were mycorrhizal, having only bulbous based root hairs.

Carex intumescens Rudge BLADDER SEDGE, aka Greater Bladder Sedge, Shining Bur Sedge, Star Sedge, Swollen Sedge (*intumescens* Latin becoming swollen, from *intumescere,* to swell and *-escens*, becoming.)
Habitat: Hydromesophytic swamps and acidic prairies, hemlock swamps (Wilhelm & Swink 1992). Wet woods, meadows, and swamps (ecs). Cool damp woods, slough and wet woods from several northern Illinois counties (Fell 1959) Wet woods, swamps, marshes, bogs (rhm02). In New England alluvial woods, wet meadows, swales (afne). Shade tolerant. No drought tolerance. No salt tolerance. pH 4.8-7.0. distribution scattered in Illinois, but not common.
Culture: 60 days cold moist stratification (pm 09). Fall plant in cold frames works well. Removing perygynia or give light soil cover should improve germination. Large seeded sedges such as this are physiologically dormant.
Description: general form Bunch type sedge, similar to *C. lupulina* roots 8" minimum root depth. culms to 3' leaves evergreen spikes pistillate 1-3, as long as wide perigynia 2-7 (15) dark green, lanceoloate-ovoid, divergent, 10-15 mm long, not crowded achenes style straight key features Similar to *C. lupulina*, but leaves evergreen. Evergreen leaves and red bases closely resemble *C. arctata* and *C. gracillima.*?
Comments: Blooms 5-6. 37,264 to 40,000 seeds per pound. This species is present in alluvial woods along Rock River in Whiteside and Henry counties. In the past we have misidentified it as *Carex lupuliformis/lupulina*, and propagated and lined it out as such, and learned of our mistake when the young plants seeded out. (It looks like a few-seeded, mutant, steroidal Hop Sedge). When this species is setting seed, the similar *C. lupulina* and *C. lupuliformis* have not yet shown seed spikes. When the hop sedges are ripening, the fruits of this sedge have largely shattered. Provides food and cover for wildlife.

Carex lacustris Willdenow COMMON LAKE SEDGE aka Hairy Sedge, Lakebank Sedge, Lake Sedge, Lakeshore Sedge, Rip-Gut Sedge, Saw Grass (*lacustris* New Latin of a lake, referring to a lake, living in ponds or lakes, from Latin *lacuster*, a lake margin, from *lacus*, lake, for *C. lacustris* a reference to growing in glacial lake plains**.)**
Habitat: Seasonally inundated areas, wet meadows. Marshes, bogs, and swamps (ecs). Calcareous marshes, calcareous shrub communities, bog borders, swampy woods (gccr92) common in all wetlands. Swampy woods, calcareous marshes, bogs, sometmes in standing water (rhm05?). In New England swamps, shores, meadows, marsh edges, in calcareous or circumneutral soil (afne). Shade tolerant. No drought tolerance. No salt tolerance. pH 5.6-6.8. distribution throughout Illinois, but infrequent in the s. cos.
Culture: Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). Seed test data indicate this species has a high percentage of dormant seed and benefits from cold moist stratification. Cold moist stratify-light. Division of mature clumps.
Description: general form Aggressive, coarse, mat-forming, rhizomatous sedges, forming large monotypic stands to 10 m across roots 12" minimum root depth, rhizomatous culms aphyllopodic, bases reddish and pinnate fibrillose;

numerous pseudoculms 20" to 4', usually taller than the fruiting culms leaves blue green, strongly M-shaped, 8-10 mm wide, margins harshly serrate spikes spikelets ascending, cylindrical, 2.5 cm long, scattered on erect culms, the lower 1-4 pistillate, the upper 2-5 staminate pistillate scales acute, 4.5 by 1.25 mm perigynia somewhat inflated, dull green, 5-7 (7 mm long by 2 mm wide) mm long, ovoid-cylindrical, strongly many nerved, blunt, *many with a tiny 3rd tooth* next to one of the small apical teeth, 0.3-1 mm long stigmas 3; N 2n = 74.
Comments: Blooms 5-6. Very irregular seed producer. *C. lacustris* seed has been known to be infected by a black, smut-like infection *inside* the perigynia (Richard Agnew, personal communication, Arkansas Valley Seed Lab seed tests). Provides food and cover for wildlife. 172,98 to 512,000 seeds per pound. Seed production in the wild in this and other aggressively rhizomatous species is "feast or famine", with many years between good crops in any particular colony. This has been noted by Fell (1959). New colonies established from seed may go three to five years before fruiting.

"Found in the county only in old drainage ditches north of Shirland, in Otter Creek bottom in Laona Township and in a prairie slough south of Killbuck Foest Preserve. In Stephenson County it is in a prairie slough south of Ridott and Pecatonica River sloughs north of Ridott. (*C. riparia* Curtis var. *lacustris* (Willd.) Kukenth.)" (Fell 1955)

Carex laeviconica Dewey SMOOTHCONE SEDGE, aka Long-toothed Lake Sedge, Smooth Lake Sedge (Latin *laevis*, smooth, free from hairs, and *conus*, a cone, and *-icus* emphasising a characteristic.)
Habitat: Collected in 1874 by E. J. Hill on "low islands' in the Kankakee River. Further west it grows in low wet prairies along rivers (gccr92). Wet prairies, marshes (rhm02). distribution Occasional in the n. ½ of Illinois, rare elsewhere, and apparently absent from the s. ¼ of Illinois. Called a western species (gccr92).
Description: pistillate scales 6 x 1.5 mm, awn 3 mm perigynia 8 x 2.5 mm, beak 3 mm, teeth 1.5 mm
Comments: Blooms June-July. 192,000 seeds per pound. "Locally common north of Shirland and in prairie sloughs in this and in neighboring counties." (Fell 1955) It resembles *C. trichocarpa* in growth habit and distribution, but with sterile stems less abundant (Fell 1959).

Carex laevivaginata (Kükenthal) Mackenzie *WI SMOOTH SHEATH SEDGE, aka Smooth-sheathed Fox Sedge, Smooth Soft Sedge (Latin *laevis*, smooth , and *vagina*, sheath, for the glabrous sheaths)
Habitat: Swamps and wet woods, wooded seeps, fens, moist limestone barrens (rhm02). Wooded seeps at the toes of bluffs and in fens, moist limestone barren, hemlock swamp (gccr92). In New England swamps, meadows, marshes, alluvial bottomlands, especially on calcareous soils (afne). River bottom (Fell 1959). distribution Scattered in Illinois, but not particularly common.
Description: perigynia the base conspicuously pale and *spongy-thickened* N 2n = 46.
Comments: Blooms 4-6. "It is a southern plant differing from *C. stipata* mainly in the firm inner band of the sheath" (Fell 1959).

Carex lasiocarpa Ehrhart var. **americana** Fernald NARROW-LEAVED WOOLLY SEDGE, aka American Woolly-fruited Sedge, Downy-Fruited Sedge, Hairy-Fruited Sedge, Slender Sedge, Slender Wetland Sedge, Slender Woolly Sedge, Woollyfruit Sedge (*lasiocarpus* rough or woolly-fruited, from Greek λάσιος, *lasios*, hairy, shaggy, woolly, and καρπός, *karpos*, fruit, for the pubescent perigynia; of the New World)
Habitat: Spaghnum bogs, sedge meadows, sometimes in shallow water (rhm02). In Washington shallow water areas and neutral bogs. Sphagnum bogs, peaty, minerotrophic sedge meadows (gccr92). In New England rich meadows, bogs, shores, swales (afne). distribution More northern and usually in peat bogs (Fell. 1959). Confined to the n. 1/3 of Ilinois, also Jefferson Co (rhm02).
Culture: 60 days cold moist stratification (pm 09).
Description: culms to 3' leaves narrow leaves pistillate scales 3 x 1.5 mm perigynia 3.5 x 1.5 mm achenes 2 x 1.5 mm N 2n = 56 key features Key differences from *C. pellita* are narrower leaves and a smooth stem, and they are not likely to grow together (Fell 1959). The inflorescence is similar to *C. pellita*, but the teeth of the perigynia not longer than 0.6 mm (gccr92).
Comments: *C. lasiocarpa* var. *americana*, Blooms 5-6. "Resembles *C. lanuginosa*. Common in wet places in the Sugar River sand area; also in low ground near Perryville (var. *americana* Fern.)" (Fell 1955) "much like *C. pellita,* but less common (Fell. 1959).

Carex lupuliformis Sartwell ex Dewey (or Sartwell at times) *IA-MI-WI FALSE HOP SEDGE, aka *Carex faux-lupulina*, Hop-Like Sedge, Hop Sedge, Knobbed Hop Sedge (*lupuliformis* hop-like in form or habit, from *Humulus lupulis,* meaning a small wolf; or after *C. lupulina* and *-formis*, with the form of.)
Habitat: Wet savannas, swamp white oak terraces. Savanna depressions and wooded morainic swamps, or morainal swamps. (Swink & Wilhelm 1994) Wet woods, wooded swamps marshes, meadows, roadside ditches (rhm02). In New England calcareous swamps, meadows, marshes (afne). distribution Scattered throughout Illinois. Rare in ne Illinois. Rare and local throughout much of its range
Culture: Fall plant or cold moist stratify, hull, light. Most lots are highly dormant and require cold moist stratification. Hulled seed germinates somewhat in greenhouse with no treatment. (gni)

Description: culms 1.4-2.0' spikes staminate spikes usually one or two perigynia ascending or slightly spreading, pale green, becoming yellowish-brown, beaks about as long as the bodies achenes about as broad as long, tapering to the apex, angles knobbed, sides noticeably depressed, short thick stipe.
Comments: Blooms 5,6. Wetland restoration, very ornamental. Spreading tussocks, calcareous. 52,144 to 90,079 seeds per pound.

Fell (1959) noted that in the Rock River Valley, both hop sedges intergrade, but typical specimens of *C. lupuliformis* are not found. Swink & Wilhelm (1994) restrict *C. lupuliformis* to those plants with manifest nipples or knobs.

"Distinction of this from the preceding (*C. lupulina*) is by no means always clear. The beak of the perigynia varies as to its smoothness and as to thickness of the angles in plants in the same clump and the same can be said of the width of leaves, length of peduncle, etc. We have plants in prairie sloughs that we have placed here." (Fell 1955)

Carex lupulina Willdenow (or sometimes Muhlenberg ex Willdenow) COMMON HOP SEDGE, *Carex houblon,* Hop Sedge, Hops Sedge (*lupulinus -a -um* Latin hop-like in form or habit, for the similarity to the infloresence of *Humulus lupulus,* from *lupulus,* a wolf, small wolf, from plants' old name willow-wolf, from its habit of climbing over willows.)
Habitat: Wet meadows, wet savanna. Upland swamps, alluvial prairies and woodlands, wooded swamp, old meanders, bogs. Wet floodplain woodlands. Sloughs and river bottoms (Fell 1959). Wet woods, wooded swamps, meadows, wet prairies, bogs, roadside ditches (rhm02). In New England wet woods, swamps, and meadows (afne). Moderate shade tolerance. Low drought tolerance. No salt tolerance. pH 6.2-7.0 distribution Common, throughout Illinois.
Cultivation Cold moist stratify for 60 days or fall plant, needs light, sow on soil surface (Wade). 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify, light. Preliminary test data indicates this species benefits from cold moist stratification. Hulled seed germinates somewhat in greenhouse with no treatment. (gni)
Description: general form Robust, caespitose sedge roots 18" minimum root depth culms 1.0-1.5', 3-13 dm tall, to 4', bases often red and pinnate-fibrillose leaves 5-13 mm wide spikes upper staminate spikelet 1, pistillate spikelets 2-6, longer than thick, with 30-60 large crowded ascending perigynia pistillate scales 10 x 1.5 mm perigynia 13-20 mm long (15 x 6 mm), green to brown, large, greatly inflated, tough, bladderlike, broadly ovoid, persistant into autumn, well adapted for floating into shore achenes 4 x 2 mm, longer than broad, angles without knobs, slightly depressed sides key features *C. lupulina* and *C. lupuliformis* are distinguished by the presence or absence prominent knobs on the achenes. The achenes do not excede 2.8 m wide.
Comments: Blooms 5-6. Wetland restoration, provides food and cover for wildlife. Bunching, often forming large patches. 52,732 to 81,376 seeds per pound. Most *C. lupulina* in the trade has at least some knobbed achenes of *C. lupuliformis.*

"Common in swamps as in the slough swamp on Kishwaukee River at Killbuck Forest Preserve." (Fell 1955)

Carex lurida Wahlenberg *IA SHALLOW SEDGE, Bottle Brush Sedge, *Carex luisant*, False Bottlebrush Sedge, Lurid Sedge, Sallow Sedge (*luridus -a -um* lurid, pale, wan, sallow, dingy, pale yellow, dirty yellow, brownish-yellow, from Latin *luridus*, pale, from *luror* paleness; dirty brown (????) in one source, for the paleness of the yellow perigynia)
Habitat: Seasonally inundated areas, swamps, deep marshes, bogs, peaty fens, particularly in sandy acidic soils ((W&S92); wet acid sites near streams. Wet ground sedge. In New Englandswamps, wet woods, shores, meadows, marshes, mostly in acidic soils (afne). Moderate shade tolerance. Low drought tolerance. No salt tolerance. pH 4.9-6.8.
Culture: 60 days cold moist stratification (pm 09). Preliminary test data indicate good greenhouse crops can be grown without cold moist stratification. Removing the perigynia may help. Hull, no further treatment, or alternately cold moist stratify, light.
Description: general form Robust, caespitose sedge; Fassett says it resembles a small *C. lupulina*, but also looks like a large *C. hystericina* roots bases red brown, 16" minimum root depth culms to 3' leaves 3-7 mm wide sheaths pinnate fibrillose heads staminate spikelets 1-3 above clustered, stalked, erect, or drooping pistillate spikelets that are thick-cylindrical pistillate scales abruptly narrowed near base(?) into a long awn perigynia inflated, broadly ovoid, green to brown, 7-10 mm long, 2.2-3.5 mm thick, 8-12 nerved stigmas 3.
Comments: Blooms 5,6. "Abundant, variable, and often weedy species" (fna). 192,000 to 347,493 seeds per pound.
Associates: Food and cover for songbirds, ruffed grouse, chicks, ducks and moose (ecs).

Carex meadii Dewey MEAD SEDGE, aka Mead's Sedge, Mead's Stiff Sedge (discovered by Dr. Samuel Barnum Mead, 1799-1880, a pioneer medical doctor who lived near Augusta, Hancock County, Illinois. Frontier doctors were by necessity botanists, using many local plants for medicines.)
Habitat: Dry and sand prairies. High prairie and sand. Frequent in southern Wisconsin (Fell 1959). Prairie kames and hill prairies, also from fens and calcareous seep areas. Prairies, barrens, fens, meadows (rhm2002). In New England calcareous meadows, moist depressions, cedar glades (afne). distribution scattered in Illinois, but not common in the s. 1/3 of Illinois.

Culture: 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify (120?)-light (Code C, D Ken Schaal). Difficult from seed, highly dormant?; or self incompatable and low viability? The early maturing seeds need to be tested for hydrophilicity.
Description: roots rhizomatous culms 0.8-2.0' leaves blades blue green, 3-7 mm wide spikes staminate spikelet long-stalked and round scaled, spikelets slender, elongate, 5-20 flowered, borne all along the leafy bracted culms as long as the leaves pistillate scales 3.5 x 2 mm perigynia 3-4.5 mm long (3.5 x 2.5 mm) 14-30 nerved, green, ovoid to bluntly triangular and somewhat asymmetrical stigmas 3 N 2n = 56 key features "Separating *Carex meadii* and *C. tetanica* can be problematic, particularly in the Great Lakes region where they seem to integrade with each other. *Carex meadii*, the more wide-ranging taxon, can tolerate drier habitats. In addition to the characters in the key, *C. meadii* tends to be a coarser plant with more grayish green leaves, shorter peduncles (bearing the staminate and proximal pistillate spikes), and thicker spikes. The perigynia, including the proximal ones, are strongly aggregated and borne in more ranks within the spike. Also, the beaks of *C. meadi*i may be more distinct and sharply curved." (fna)

"Stouter than *C. tetanica*, likely to be in wetter places and much less common. Kent Creek bottom on Cunningham road west of Rockford." (Fell 1955)

According to Fell (1959), *C. meadii* is more robust than C. *tetanica***,** and has a distinctive blue color that is conspicuous in grass, while *C. tetanica* has green leaves and is hard to distinguish from grass. The former is a dry sedge and the latter is of wet places. *C. meadii* forms large, open, clonal patches and has a distinctive bluish cast when flowering and fruiting.
Comments: Blooms 4-6. Uncommon prairie sedge, a very distinctive blue-green in spring. This is also said to occur in fens and calcareous seeps, where it is difficult to distingiush from *C. tetanica.* Maybe it really is *tetanica* in the wet. At least one or two guide books separate these species this way, but I have seen *C. tetanica* in a dry oak opening hill prairie near Tiskilwa. This species uses a great deal of energy in vegetative reproduction, and may set much empty seed. 304,000 to 320,000 seeds per pound.

Carex molesta Mackenzie ex Bright, Trillia. 9: 4, 20. 1930 (as *modesta*) TROUBLESOME SEDGE, aka *Carex dérangeant,* Common Field Sedge, Field Oval Sedge, Round-Headed Sedge (*molestus -a -um* ME *molesten*, from Ofr *molester,* from Latin *molestare,* from *molestus* troublesome, disturbing, irksome, annoying, unmanageable (taxonomically), from its variability and resemblance to similar species.)
Habitat: Disturbed prairie, moist fields, ditches, disturbed wet depressions, upland swamps (W&S92); Fields and low meadows; old fields, moist prairies, swamps, wet depressions, ditches (Mohlenbrock 1999). Moist places (Fell 1959). Fields, roadsides, bottomlands, openwoods, on dry to wet, often heavy, calcareous soil (fna). In New England open areas, dry or moist, often, heavy calcareous soils (afne). Tolerant of coarse, medium, and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade intolerant. pH 4.9-7.0. distribution scattered throughout Illinois. Somewhat weedy, introduced in California.
Culture: Cold moist stratify, light. Fall plant in cold frame works well (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09). Easy with no treatment (gni2002). Growth rate slow. Seedling vigor low. Vegetative spread rate slow. Slowly spreads from seed.
Description: general form Similar to *C. brevior*, plants caespitose, slender roots 10" minimum root depth culms 1-15 dm tall, vegetative culms few, inconspicuous heads spikelets all alike, short sessile, mostly 3-4, round based and crowded at the culm tip spikes staminate flowers confined to tapering spikelet bases perigynia ovate, beaked, and 2.2 - 4.2 mm wide, more ovate and greener until ripe, and faintly nerved over inner face and scalelike, with translucent margins or wings, wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 68, 70.
Comments: Blooms 4-6. 400,000 to 700,617 seeds per pound. *C. molesta* has been a poorly understood species in the Midwest, and has been confused with *C. straminea, C. brevior, C. merrit-fernaldii*, and *C. festucacea.*

"Differs from the above (*C. brevior*) by having shorter scales and only the terminal spike at times clavate; these things are not important enough, according to Jones, to justify separation as a species. About as common as the above but more likely to be found in moist places." (Fell 1955) "Differs from *C. brevior* in minor characteristics, and has been considered a variety" (Fell 1959).

Carex muehlenbergii Schkuhr ex Willdenow (sometimes seen as just Schkuhr, or Willdenow?) *ME, VT MUEHLENBERG'S SEDGE, aka *Carex de Mühlenberg*, Muehlenberg's Bracted Sedge, Muhlenberg Sedge, Sand Bracted Sedge, Sand Sedge, (*muehlenbergii* New Latin, from Gotthilf Heinrich Ernst *Mühlenberg,* 1753-1815, American German Lutheran minister and pioneer botanist, born in Trappe, Pennsylvania and educated in Halle Germany, who studied botany and other natural sciences in his spare time, and New Latin *–ia.* He was the first president of Franklin College. The accepted spelling for *Carex muehlenbergii* and *Quercus muehlenbergii,* named for the same individual, has changed. His second name is sometimes seen as Henry.) The older correct spelling is *muehlenbergia*, which makes one wonder how to spell the grass genus.
Habitat: The common *Carex* of sandy soils. Dry and sand prairies, open, scrubby, black oak savannas, sandy disturbed ground; dry open sand barrens. Dry often sandy open soil (Swink 1990). In New England dry fields and open woods, often on sand (afne). Common in sand areas, the variety *enervis* Boott. is the usual form in calcareous soils. (Fell 1959)

Culture: Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify, light.
Description: general form Plants dark green, caespitose roots short thick rootstock culms 1.5-2.0', stems stiff, harshly scabrous above leaves the stiff leaves folded, sickle shaped, wiry, gray-green, 2.5-4 mm wide, old leaves are conspicuous heads dense green head of globose spikes spikes spikelets short, sessile; staminate flowers at apex of of each spikelet, a tiny club-shaped mass of whitish scales remaining after anthesis spikelets aggregated into a an ovoid head pistillate scales 3.5 x 1.5 mm perigynia 4 x 2.5 mm plano-convex, ovate, gray green, becoming yellow or dark red, usually with strong nerves on slightly convex inner face. *Note spongy thickened at the base* stigmas 2 key features Differs from *C. gravida*, *aggreregata, cephaloidea,* and *sparganoides* in having a tight, not septate leaf sheath.
Comments: Blooms 5-6. 180,445 to 293,092 seeds per pound. "Our commonest sedge of sandy soils" "A common sedge in the sand areas but very uncommon elsewhere" (Fell 1955)

Carex muskingumensis Schweinitz MUSKINGUM SEDGE, aka Palm Sedge, Swamp Oval Sedge, Swamp Sedge (*muskingumensis* after the Muskingum River, near the momentarily brought to fifteen minutes of fame Muskingum College, alma mater of John Glenn.)
Habitat: In woods along major streams, wet savannas, upland swamps, wooded depressons, wet woodland pockets, low woods, wet meadows, and river bottoms; deciduous floodplain forests of large rivers. "Its most characteristic habitat is along the Kankakee River, where it is found in the highly organic leaf and root litter over mud in the old stream meanders which are inundated in spring" (Wilhelm & Swink 1992). Low, swampy woods and floodplains along major streams, wooded depressions (rhm2002). distribution Occasional throughout Illinois.
Culture: Fall plant or cold moist stratify, light. Easy with no treatment, moist stratification may improve germination, but not necessary. Fresh seed not necessary (gni).
Description: general form Plants cespitose, caespitose, slender, somewhat larger, robust. plants very stiff, resembling a pumped-up, steroidal form of *C. scoparia* plants culms with slender pseudoculms prominent, leafy, 1.5-2.5' tall leaves 2-10 mm wide spikes spikelets all alike, short sessile, acute at both ends, 10-30 mm long, 3-6 mm thick, staminate flowers confined to tapering spikelet bases perigynia incurved- adpressed, lanceolate, 6-10 mm long, 1.2-2.2 mm wide, slenderly lanceolate, thin and scalelike, with translucent margins or wings, wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2. N 2n = 80.
Comments: Blooms 4-6. Wetland restoration cool season, ornamental, with many leafy sterile stems, widely available as an ornamental "grass" with several selections. 602,122 to 716,088 seeds per pound.

This species tends to tenaciously hold some of its seed until mid fall, but some open-grown plants can start shattering in mid-July. A real bugger to combine. A very large-seeded, steroidal Ovales. This sedge resembles *C. tribuloides* in growth habit (Fell 1959).

Carex nebraskensis (or *nebrascencis*) Dewey NEBRASKA SEDGE, aka Plains Tussock Sedge (*nebraskensis* of, from, or pertaining to Nebraska.)
Habitat: Adventive from further west along a railroad and several highways, saline or alkaline roadsides, in wet and often alkaline soils. Can thrive in dry sites as long as its roots remain wet. Best on medium fine to fine textured soils. 2,000-4,500' Neutral or basic soils. Low acid tolerance, medium salinity tolerance. Tolerant of disturbance.
distribution Alkaline roadside, 3 miles south of Woodhull on I-74 southbound, left shoulder, North of Rio Road, south of the Police turn around. Known from several I-74 cloverleaves in the city of Peoria (Jim Alwill, IDOT, personal communication). Also DuPage and Kane cos. Western Cascades to the Great Plains.

"Wet places, often where alkaline, from lowlands to mid montane elevations. It ranges from Washington to California, wholly east of the Cascades, east to South Dakota, Kansas, and Nebraska, and through the Rocky Mountain States to New Mexico"
Cultivation Cold moist stratify. When seeded alone for pasture, drill 5 lb pls per acre in the fall or spring (Granite). Seed 1-2 lb/acre in fall or spring (Rainier). Seed tolerates dry storage at room temperature for 8-12 months (Hoag 2001).

Scarify seeds with 100 grit sandpaper for 10 to 15 seconds. Cold moist stratify in a cloth or mesh bag with sphagnum peat moss for 30 to 32 days @ 3º C (37º F). Germinate at 26º C (78ºF) night and 37º C (98º F) daytime with 24 hour photoperiod. Perigynia is a source of dormancy in this species. It is removed during scarification. There is also some physiological dormancy in the achenes, which is partially removed by 32 days cold moist stratification. Total germination was best with achenes scarified and stratified in sphagnum peat moss. (Hoag 2001, using seed from Jackpot, Nevada and Aberdeen, Idaho.)
Description: general form Plants caespitose, slender, medium to tall, grass-like perennial sod-former, roots rhizomatous culms 1-15 dm tall, spikelets all alike, short sessile heads staminate flowers confined to tapering spikelet bases perigynia thin and scalelike, with translucent margins or wings, wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2.

Comments: Blooms 5-6. Sod forming, good erosion control, good palatability for livestock and valuable for providing forage and cover for waterfowl. Satisfactory forage values. Good wildlife values. Excellent for riparian reclamation where it is native. Probably more common than herbarium records indicate. 425,891 to 912,300 seeds per pound.

Carex nigra (Linnaeus) Reichard *MI, WI SMOOTH BLACK SEDGE, aka Black Sedge, *Carex noir*, Common Sedge (*niger, -gra, -grum* from Latin for black, blackness; shiny black, as opposed to *ater*, matt black.)
Habitat: Eastern coastal (?) species with disjuncts in Michigan and Wisconsin. In New England, it grows in wet meadows, swamps, open turfs, and swales (afne). Also in Central Europe.
Description: N 2n = 83, 84, 85 key features differs from *C. lenticularis* by the rhizomatous habit, dark green leaves, black scales and perigynia, and the short inflorescence bract. (fna)
Comments: Not uncommon in nursery trade as an ornamental grasslike plant. Self incompatable. *Carex nigra* seed is known to be infected with the smut *A. heterospora* and the gall mite *Phytoptus carcis* (Ingvarsson and Ericson, 1998, 2000).

Carex normalis Mackenzie GREATER STRAW SEDGE, aka Intermediate Sedge, Normal Sedge, Spreading Oval Sedge, Scale Wood Sedge (Latin *normalis*, made according to square < *norma*, carpenters square, from the angular sterile culms, with regular spreading leaves)
Habitat: Uncommon, wooded floodplains, pond edges, mesic savannas, riparian terraces, marshes, pond borders, open woods and meadows. Common in or near deciduous forests. Seep springs, mesic woods, floodplains, streambanks, mesic savannas, marshes, pond borders, moist fields, ditches (rhm02). Mesophytic savannas, marshes and along pond borders, moist fields (Wilhelm & Swink 1992). In New England rich, open woods, thickets (afne). Common sedge of dry prairie roadsides (Fell 1959). distribution *Forma normalis,* with spikes continuous, is common throughout Illinois
Culture: Cold moist stratify, light (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09).
Description: general form Somewhat larger plants with slender pseudoculms, plants caespitose culms tufted slender, 1-15 dm tall, culms weak (but stout according to Fell (1959); aphyllopodic, leafy stemmed leaves 2-10 mm wide heads spikelets 3-10, rounded, usually crowded near straight culm apex spikes all alike, short sessile, staminate flowers confined to tapering spikelet bases pistillate scales 2.5 x 1 mm perigynia 4 x 1.5 mm, ovate, thin and scalelike, beaked, 2-2.5X as long as wide, nerved on inner face, green, finally becoming pale brown, somewhat divergent, perigynia less than 2 mm wide, slenderly lanceolate with translucent margins or wings, wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 68
key features *C. tenera* has narrower leaves. *C. Bebbii* has fewer spikelets. *C. projecta* has browner, narrower perigynia with bent beaks. *C. cephaloidea* has delicately textured glossy perigynia. "The inner band is prolonged at the mouth of the sheath thus differing from *C. brevior* and *C. festucacea* which it resembles " (Fell 1959).
Comments: Blooms 5,6. 400,000 to 930,328 seeds per pound. "A common roadside sedge found in dry places. A larger plant having wider leaves than *C. tenera*." (Fell 1955)

Carex ovalis Goodenough OVAL SEDGE, aka *Carex des lièvres*, Eggbract Sedge, Tracy's Sedge (*ovalis* oval, broadly elliptical, from Medieval Latin *ovalis*, from Late Latin, of an egg, from Latin *ovum* egg and *-alis* -al.)
Habitat: In the NW, wetlands, and along streams, meadows, seasonally wet soils, 0-1100 meters. In New England, dry pastures, roadsides (afne). distribution Native to Eurasia and NORTHWEST USA?.
Comments: Introduced Carex, locally established in B.C., N.B., Nfld., Labr., N.S., P.E.I., Maine, N.H., N.Y., N.C., Pa., Tenn., Wisconsin, and New Zealand. At one time in the seed trade as *Carex ovales*. As if we needed another Ovalian sedge. A USDA website wrongly says this is native in the eastern United States.

C. ovalis is also known from California, Nevada, Oregon, and Washington, where it is considered native and sometimes separated as *C. tracyi* Mackenzie.

Carex pedunculata Muhlenberg ex Willdenow (or just Muhl.) LONGSTALK SEDGE, aka *Carex pédonculé* Early Wood Sedge, Long Stalked Sedge, Pedunculate Sedge (*pedunculatus -a -um* with a peduncle, from Latin *pedunculus*, diminutive of *pes*, foot, from the notably pedunculate pistillate spikes)
Habitat: Cool wet to dry woods (Fassett). Dry calcareous wooded ravine slopes, sloping clay bluffs, north-facing bank of ravine, dry upland slope (S&W92). "characteristic of hummocks at the bases of old growth beech trees" east of Chicago (Swink & Wilhelm 1994). Moist to dry mixed forests and woodland openings, on basic and acid substrates. (www.eFloras.org). Dry calcareous slopes, moist ravines (rhm02). In New England rich woods (afne). distribution Rare, Cook, JoDaviess, Kane, Lake, McHenry, and Winnebago cos. "This rare sedge has been found on the crest of moist dolomitic cliffs in Seward Bluffs and Rock Cut Forest Preserves, at the "dells" of Hall Creek and the south ledges of Kinnikinnick Creek in Winnebago County, and White Pines Forest State Park in Ogle County." (Fell 1959).

C. pedunculata has a classic eastern North America eastern Asia disjunct distribution (P.W. Ball, 1990). The Korean plant is known as var. *erythrobasis* (H. LéVeillé & Vanoit) T. Koyama.
Culture: The germination requirements of *C. pedunculata* may represent an adaptation to ant dispersal. It requires light to germinate at maturity, but with dry storage, gains the ability to germinate in the dark. This would mimic gathering,

consuming the elaiosome, and discarding the seed underground by ants. (Bond 1999) Available as plugs from The Natural Garden.
Description: general form small tufted sedges, solitary dense evergreen clumps roots forming purple based lax mats, culms 5-15 (54) cm tall, plant bases brown to red purple leaves stiff flat dark green blades 2-4.5 mm wide, only the tips dying back in winter, with reddish band at die-back point sheaths strong red nonfibrillose basal sheath heads staminate spikelet 1, usually pistillate at the base, some spikelets on peduncles 1-12 cm long from spathe-like sheaths (bracts) at plant base pistillate scales 4.5 x 2 mm perigynia 4 x 1+ mm minutely pubescent, with only 2 ribs, perigynia smooth, triangular with *slender spongy stipe* and minute beak. "the cuneate base pale, *spongy*" (Wilhelm & Swink, 1992) stigmas 3 N 2n = 26.
Comments: Blooms 3-4. "It is usually accompanied by *Cryptogramma stelleri*, *Oryzopsis racemosa,* and *Carex eburnea* here (the above locations) as it is in Apple River Canyon State Park in Jo Daviess County. The early flowering and early dropping of fruit accounts for its being often overlooked. Once known it is easily recognized by the tufts of persistant foliage." (Fell 1959).

The *spongy base* of the perigynia is an elaiosome, attracting ants that distribute the seeds. Handel (1976) says the achenes are subtended by elaiosomes. At least four carex species in eastern North America have ant dispersed seeds. Someone should investigate the other sedges with spongy based perigynia as potential or incipient elaiosomes.

Characterized as a 'fugitive species' colonizing openings in the woods and decreasing as other species move in.

Carex pellita Willdenow BROAD LEAVED WOOLLY SEDGE, Bull Sedge, *Carex laineux,* Woolly Sedge (*pellitus - a -um* from Latin *pellitus*, clothed or clad in skins.)
Habitat: Wet meadows, moist calcareous prairies, prairie fens, degraded wetlands, marshy areas, sandy sedge meadows (gccr92). Usually in calcareous mineral soil in wet meadows, low prairies, and ditches, occasionally in upland fields. Wet prairies, fens, marshes, sedge meadows, swamps (rhm02). In New England meadows, marshes, shores, especially in calcareous soils (afne). "A common wet ground sedge found all over the area in ditches, sloughs, and wet prairies" (Fell 1959). Prefers moist soil. Tolerates 0-6" inundation early in the season. pH tolerances not available. Nutrient load tolerances moderate to high. Salt tolerance low. Siltation tolerance moderate. Full Sun. distribution Occasional to common thoughout Illinois.
Culture: Fall plant or cold moist stratify, light (Code C, D Ken Schaal). 60 days cold moist stratification (pm 09). Fall seed w/ new crop seed, or cold moist stratify.

Seed, rhizomes, and divisions are used in propagation. Good seed crops can be irregular. Limited market availability! Seeding rate not advisable, but directly related to the size of your bankroll.
Description: general form Closely resembling *C. stricta*, but not forming tussocks. Medium sized perennial rhizomatous sedge culms 1-3', with numerous short pseudoculms bases reddish leaves blades M-shaped, 2.5-4.5 mm wide sheaths pinnate fibrillose sheaths heads bracts flat somewhat divergent; pistillate spikes 1-3, ascending, remote, 1-4 cm long spikes staminate spikelets 1-3 1.5-2 pistillate scales 4.5 x 1.25 mm, often minutely fringed on margins; perigynia small, globose, pubescent, 3-4 (4) mm long and 1-2 (1.25) mm thick achenes 1.5 x 1 mm stigmas 3 N 2n = 78.
Comments: Blooms 5-6, fruiting 5-8. Wetland restoration, useful in upper shoreline zones and in vegetated swales. Seeds are eaten by waterfowl, sora and yellow rails, swamp and tree sparrows, and other song birds; cool season, calcareous. 254,199 to 345,509 seeds per pound**.**

C. pellita is considered nonmycorrhizal and has bulbous-based root hairs. The unusual root hairs may represent an adaptation for nonmycorrhizal growth. (Miller et al. 1999). Zero of sixteen plants analyzed by Miller et al. (1999) were mycorrhizal.

Carex pensylvanica Lamarck PENNSYLVANIA or PENN SEDGE, aka *Carex de Pennsylvanie*, Common Oak Sedge, Early Sedge, Yellow Sedge (of Pennsylvania)
Habitat: Ubiquitous, in most native systems, including full sun, limited only by excessive soil moisture. One of the most abundant and widespread sedges, in most habitats except wet soils. Open woods and wooded slopes. Savannas, open woods (rhm02). Savannas, black oak savannas (gccr92). In New England open, dry soil, open woods (afne). Tolerates a wide range of light. "Perhaps our most common sedge" (Fell 1959). distribution Occasional to common in the n. ½ of Illinois, much rarer southward.
Culture: Clone, division. Cold moist stratify or fall plant, light (Wade). Fresh seed should be dried briefly (one week maximum), cleaned, and stored in air-tight zip-lock bag in the refrigerator until sown (Cullina 2008).
Description: general form Small tufted sedges, in tufts connected by slender rhizomes, some say stolons culms erect, up to 16" on a good day, plant bases brown to red purple leaves yellow green, 1-3 mm wide sheaths with reddish brown longitudinal fibrils spikes pistillate spikelets 1-3, globose, sessile, close to base of staminate spikelet, staminate spikelet 1, 5-20 mm long, tapering to each end, with purplish brown, white edged scales perigynia minutely pubescent, with only 2 ribs, 2.5 x 1.5 mm, globose, short-beaked, minutely pubescent, green to gray, often infected with black smut fungus (Fawcett). *The stipe thick* and pale stigmas 3 N 2n = 36.

Comments: Blooms 4-5. Fruiting 5-7. Landscaping, stoloniferous? Can be used as a native turf. 464,000 to 480,000 seeds per pound. "Very early and very common in woods and open places. An important sand binder in the Sugar River area." (Fell 1955) *C. pensylvanica* increases under grazing pressure in the Flint Hills (Herbel & Anderson, 1959)

Miller et al. (1999) found *Carex pensylvanica* from Poplar Creek to be non AM mycorrhizal, and having dark septate fungi. One of eight plants analyzed by Miller et al. (1999) were mycorrhizal, having hyphae, and dark septata hyphae.

Carex plantaginea Lamarck PANTAIN-LEAVED SEDGE, aka Pantain-Leaved Wood Sedge, Plantainleaf Sedge (*plantagineus -a -um* plantain-like, like *Plantago*, from *Plantago* and *-ineus*, denoting a close resemblance, for the plantain-like leaves)
Habitat: Beech maple forests, "climax forests" Rich woods (rhm02). In New England rich, deciduous or mixed woods (afne). distribution Very rare, Cook and Johnson cos.
Species in the *C. laxiflora* group are reported to be hydrophilic seeds. (Cullina 2008).
Description: culms basal sheaths strongly red purple leaves 1-4 cm wide, yellowish to dark green, evergreen spikes staminate spikelets long stalked, bladeless bracts perigynia triangular, curved N 2n = 50, 52.
Comments: Blooms 3-5. The evergreen basal leaves are not terribly fond of spring fire. It is very dificult for the plant to regrow the leaves and flower in early spring. They are even less fond of northwest Illinois droughts.

Carex praegracilis W. Boott. CLUSTERED FIELD SEDGE, aka *Carex très grêle*, Highway, Tollway, or Expressway Sedge, Meadow Sedge, Slender Sedge, Slim Sedge (*praegracilis* very thin or graceful, from Latin *prae*, before, in front, and *gracilis*, thin, slender, for the slender elongate culms)
Habitat: Saline roadsides. Formerly known from several dry prairies in the greater Rockford Airport area and from a low prairie situation in DeKalb County (Fell 1959). Low prairies, roadsides, particularly where salt has been applied during the winter months, dry sterile soil, low areas of medians, and drainage swales (rhm02). Interstate highway areas of high salinity, lower areas of medians and drainage swales, also in a Lake County disturbed savanna (Wilhelm & Swink 1992). In New England low, open ground, shores (afne). distribution occasional in the n. 1/5 of Illinois, also Christian Co.
Cultivation Seeds need light. Clone.
Description: roots sympodial rhizomes culms 8-30" pistillate scales 3 x 1.2mm perigynia 4 x 1.5 mm.
Comments: Blooms 4-5. Non-native, western halophite Forms unisexual clones on roadsides. The clones may vary in length of leaves, height of stems, time of flowering, and amount of fruit. " (Fell 1959). In Walnut Twp., Bureau County it is now appearing on local blacktop roadsides. 756,000 to 1,816,000 seeds per pound.
"This we have found in a low prairie situation in DeKalb but we do not know of it in Winnebago County." (Fell 1955)

Carex prairea Dewey ex A. W. Wood (or seen as *C. prairea* Dewey) FEN PANICLED SEDGE, aka Prairie Fen Sedge, Prairie Sedge (*prairea* of the prairie)
Habitat: Bogs, fens, drainage swales, floating sedge mats, wet meadows, wet prairies, swamps (rhm02). Bogs, calcareous fens, peaty, minerotrophic, floating sedge mat (W&S92). "Very uncommon being known to us only on the north branch of Kent Creek at Springfield avenue and in a shallow bog west of South Beloit." (Fell 1955) " A northern species that is known only in a few wet places in Winnebago County and a bog in DeKalb County." (Fell 1959). In New England calcareous bogs, meadows, swamps (afne). distribution Occasional in ne, Illinois and in cos. along the Illinois River
Culture: Cold moist stratify for 60 days or fall plant, needs light, sow on soil surface (Wade).) 60 days cold moist stratification (pm 09). Cold moist stratify 360 days and it grows like dog hair (gni)
Description: general form Plants in dense tussocks (densely cespitose), stems, leaves long and slender, resembling *C. stricta* leaves, 1.5-3.5 mm wide sheaths slim leaf sheaths tinged with yellow or coppery brown, sheath mouth copper-tinged heads inflorescence compound, of many tiny crowded sessile spikelets, each group of which resemble a single spikelet pistillate scales 3 x 1.5 mm perigynia 3 x 1.5 mm green to pale brown, plano convex, lanceolate, nerveless on the flat face, soon falling N 2n = 66.
Comments: Blooms 5. 1,344,000 to 1,350,000 seeds per pound.

Carex prasina Wahlenberg *WI DROOPING SEDGE, aka *Carex vert poireau*, Leek Green Sedge, Leek Sedge (*prasinus -a -um* grass-green, green like a leek, from Greek *prasinos*, leek green, for the color of the leaves.)
Habitat: Wet mesic swamp forests near Lake Michigan. Rich woods (rhm02). In New England rich, low woods, meadows (afne). distribution Scattered in the nw. ¼ of Illinois, also Johnson and Lawrence cos.
Description: sheaths Lower sheaths green or brown perigynia beaked, sharply 3-angled N 2n = 60.
Comments: Blooms 5. 800,000 seeds per pound.

Carex projecta Mackenzie * OH LOOSE-HEADED OVAL SEDGE, aka *Carex à bec étalé*, Moniliform Sedge Necklace Sedge (from Latin *projicio*, to throw at, push forth, from the moniliform inflorescence, with the spikelets extended or projected along it.)

Habitat: Open swamps and wet meadows. Very common in damp woods and clearings in northern Wisconsin and floodplains of Mississippi and Wisconsin rivers (Fassett). Swampy woods, moist woods, riparian terraces (rhm02). Shaded moranic slopes and riparian terraces, intermittently inundated terrace of the Kankakee River, moist sandy woods, open wetlands (gccr92). In New England damp woods, thickets, meadows, shores (afne). distribution Scattered throughout Illinois. DeKalb and Winnebago Counties (Fell 1959).
Culture: Light, cold moist stratify or fall plant (Wade). Grows well with no treatment, hulling improves germination. (gni)
Description: general form Somewhat larger plants with slender pseudoculms. Very similar to *C. tribuloides*, but variable in size; plants caespitose roots short black fibrillose rhizomes culms slender, wiry, 1-15 dm, (to 1.2 m) tall, angles harshly scabrous, leafy sterile shoots common leaves 2-10 mm wide, leafs lax, to 5 mm wide, often equaling or exceeding the inflorescence heads axis of inflorescence flexible or arching spikes spikelets all alike, short sessile, somewhat spaced staminate flowers confined to tapering spikelet bases pistillate scales short, blunt perigynia less than 2 mm wide, slenderly lanceolate. thin and scale-like, with translucent margins or wings, wings not abruptly narrowed, occasionally crinkly margined, beaks tending to be bent backwards a little and can be C-shape in cross section, in apex of spikelet, wind dispersed, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 64 key features Similar to *C. tribuloides* perigynia and achene, but differs in its separated moniliform spikes. "In many respects *Carex projecta* is intermediate between *C. cristatella* and *C. tribuloides*; it is sometimes difficult to distinguish from those species. However, when all three species occur together, *C. projecta* flowers and fruits first, *C. tribuloides* later, and *C. cristatella* latest of all. When *C. projecta* is in mature fruit, *C. cristatella* will be just past flowering." (fna)
Comments: Blooms 5-6. 1,434,439 to 2,208,000 seeds per pound.

"This may be a variety as the prolonged spike is the main feature which separates it from the preceding (*C. projecta*). Prairie slough east of Rockford, Kishwaukee River slough near Killbuck Forest Preserve and on an old drainage ditch west of Yale bridge. Also in DeKalb County." (Fell 1955) " This uncommon sedge looks somewhat like *C. tribuloides* but is of a more lax habit." (Fell 1959)

Carex projecta has over wintering vegetative stems that root and produce new shoots at the nodes. (Ball and Reznicek , 2002)

Carex pseudo-cyperus Linnaeus CYPERUS-LIKE SEDGE, Cyperus Sedge, False Bristly Sedge (*pseudo-cyperus* "false" cyperus, false flat sedge, from Greek ψευδής, *pseudes*, false, and *Cyperus,* for its resemblance to a flat sedge)
Habitat: Swamps, marshes, around ponds (gccr92). In New England shores, swamps, bogs (afne). distribution Native north and east of our area, but cited by Deam from Lake County, Indiana.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: general form One of the porcupine sedges N 2n = 66 key features It differs from *C. hystericina, C. lurida*, and *C. baileyi* with its noninflated perigynia. *C. comosa* is very similar, and has a non-inflated perigynia, *C. pseudo-cyperus* has perigynia only 3-5 mm long and the teeth of the beak are straight rather than spreading. (Mohlenbrock, 2005) It is a smaller and more slender plant than *C. comosa.*
Comments: Blooms 6-8. Voss (1972) states that occasional specimens are close to *C. comosa.*

Carex radiata (Wahlenberg) Small EASTERN STAR SEDGE, aka *Carex rayonnant,* Star Sedge, Straight-Styled Wood Sedge, Tufted Wood Sedge (*radiatus -a -um* radiate, rayed, with rays, radiating in form, from Latin *radius,* a ray, spoke of a wheel, for the radially spreading perigynia)
Habitat: Moist, mesophytic woodlands, usually near moist depressions, usually in moister areas than the closely related *C. rosea*. Woods, both mesic and dry, disturbed areas. (rhm02). In New England moist woods (afne). distribution Common from Cook County eastward, while *C. rosea* is common from Cook County westward (Swink & Wilhelm 1994). Scattered throughout Illinois.
Culture: 60 days cold moist stratification (pm 09). (Code C, D Ken Schaal). Seed is dormant as a doorknob. *Carex radiata* is one of those seeds that have a perishable elaiosome and should be stored in a ziplock in a refrigerator until sown or pretreated. Alternately Kew indicates storage behavior is Orthodox p, with 92% viability of seed dried to 15% and frozen for 11 months at -20º C. Hmmm, only viability, not germination.
Description: perigynia 3-7 radiating in all directions, 2.5-3.8 mm long, to 1.5 mm wide, rounded or broadly cuneate at *the spongy base, spongy-thickened at base*, the body filled by the achene, nerveless on both faces, the beak serrulate, mostly 0.5-0.8 mm long, typically shorter than the elongate stigmas achenes N 2n = 58.
Comments: Blooms 4-5. 716,088 to 800,000 seeds per pound. 5.93 grams per 1000 seeds.

Carex retrorsa Schweinitz DEFLEXED BOTTLE BRUSH SEDGE, Hooked Sedge, Knot Sheath Sedge, Retrorse Sedge (*retrorsus -a -um* bent backward or downward, from Latin *retrorsus*, contraction of *retroversus*, turned or bent backwards, for the deflexed or downward pointing lower perigynia)

Habitat: Stream terraces, riverine wet meadows; wet woods and adjacent lowlands. In New England alluvial woods, low grounds, swamps, shores (afne). distribution Occasional in the n. ½ of Illinois, also in Coles, Richland, & Union cos.
Culture: 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify, light. *C. retrorsa* may be short-lived in plantings and is often difficult to find seed and plants.
Description: general form Caespitose sedge, variable in size of plant, spikelets, and perigynia culms bases often red and pinnate-fibrillose leaves 3-8 mm wide sheaths with raised septa between the veins heads pistillate spikelets crowded at the top of the culm, sometimes hiding the staminate spikelets pistillate scales 5 x 2 mm perigynia horizontally spreading, the lower reflexed, large, 5 x 2mm, 5-10 mm long, greatly inflated, green or tan, with delicate papery texture, curved back or at the least divergent from the axis, persistant into autumn; well adapted for floating into shore.
Comments: Blooms June 5-7. 176,000 to 225,198 seeds per pound. *C. retrorsa* seed may form part of a short term persistent soil seed bank, with a longevity of >1yr to < 5 yr (Thompson et al., 1997) Storage behavior is Orthodox? Seed oil content 4.8%, protein content 11.3%.

"Uncommon. Sugar River sloughs at the Forest preserve and west of Yale Bridge, Coon Creek slough south of Rockton-Shirland road, Kishwaukee Rive slough at Killbuck Forest Preserve and in a prairie slough at Alpine and Sandy Hollowroads east of Rockford." (Fell 1955) It often grows with and can be confused with the Hop sedges. Robust sedge of sloughs and stream bottoms, abundant in places (Fell 1959).

Carex rosea Schkuhr ex Willdenow (*C. convoluta* Mackenzie) CURLY-STYLED WOOD SEDGE, aka Rosy Sedge, Star Sedge, Stellate Sedge, Tufted Wood Sedge, (Latin *roseus,* of roses, for the rosulate-spreading perigynia (*rosulate* from late Latin *rosula*, diminutive of *rosa,* rose))
Habitat: Mesic woodland, common, in rich woods, resembles *C. convoluta*, but narrower, softer leaves. Mesic woods (rhm02). In New England dry, open woods (afne). distribution Occasional throughout Illinois.
Culture: 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify, light. Seed is dormant as a doorknob. Kew notes storage behavior is Orthodox p, with 89-96% germination after 140 days imbibing on 1% agar at 5ºC.
Description: general form Densely ceaspitose culms slender, wiry, 0.5-1.0' smooth or scaberulous below the inforescense, equal to or shorter than the inflorescence leaves blades 1.7-3 mm wide, margins scaberulous sheaths smooth, tight, with hyaline ventral band heads spike 2.5-6 cm long spikes 4-7, androgynous, about as long as wide, perigynia radiating in all directions at maturity, lowest 2-4 remote pistillate scales scarious, ovate, obtuse, not reaching the base of the beak perigynia lanceolate 3.5-4.5 mm long, serrulate beak about 1 mm long, body nerveless on both bases, *spongy-thickened and wrinkled below the middle* stigmas shorter than to about as long as the beak, thick, dark red N 2n = 52.
Comments: Blooms 4,5,6. 606,141 to 848,000 seeds per pound. *C. convoluta, C. rosea,* and *C. radiata* can be quite confusing. View references to these species which lack herbarium specimens with caution. This species had been known as *C. convoluta* Mackenz. and *C. radiata* had been known as *C. rosea*.

Miller et al. (1999) found *Carex rosea* from Poplar Creek to be mycorrhizal, and having dark septate fungi. Five of nine plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, hyphae, and dark septate hyphae.

Carex rostrata Stokes BEAKED SEDGE, aka Northern Yellow Lake Sedge (*rostratus* rostrate, beaked, from Latin *rostratus*, beaked, referring to the shape of a beak, for the beaked perigynia.)
Habitat: Shallow water or wet soils around waterways. Bogs, sloughs, around ponds and lakes, swamps (Molhenbrock, 2005) In New England shores, swamps, bogs (afne). Wet meadows from low to moderately high elevations. "Very common throughout its range." "A robust northern plant that grows in Sugar and Pecatonica river sloughs and in the prairie slough in the Searle Tract on North Central Avenue, Rockford." (Fell 1959) Best in moderately fine to fine textured soils. Neutral to basic soils (Granite) Shallow water and wet soils. 2,000-4,500'. Low acid tolerance. Medium salinity tolerance. distribution
Culture: When planted alone for pasture, drill 7 lb pls per acre in fall or spring (Granite). Plant 1-2 lb/acre in fall or spring (Rainier).
Description: general form Medium to tall grass-like perennial sod-former roots coarse strongly rhizomatous, sod forming, sedges, forming large monotypic stands to 10 m across culms new shoots evergreen, numerous pseudoculms 0.5-1.5 m high, 13-36"+, usually taller than the fruiting culms, bases reddish and pinnate fibrillose leaves pale or yellow green, 3-8 mm wide, dried leaves show numerous cross veins more prominently than other species spikes spikelets yellowish, brown, or red-tinted ascending, cylindrical, 2.5 cm long scattered on erect culms, the lower 1-4 pistillate, the upper 2-5 staminate pistillate scales acute, pistillate scales 5 x 0.5 mm perigynia 5.5 x 2.5 mm, 50-130 per spikelet, somewhat inflated, 16 nerved; perigynia variable in size and shape, but usually broadly ovate and more abruptly tapering than its close relatives achenes 2 x 1.5 mm stigmas 3 N 2n = 60.
Comments: Blooms 7-9. Good erosion control. Satisfactory forage, moderately palatable, provides good habitat for wildlife. Good wildlife values. Wetland and riparian restoration. 360,000 to 440,000 seeds per pound. "We have found

this widespread species only in a Coon Creek slough south of Rockton-Shirland road and in a pecatonica River slough north of Pecatonica. In vegetative features it resembles *C. lacustris*. Ours is var. *utriculata* (Boott) Bailey." (Fell 1955)

Carex sartwellii Dewey RUNNING MARSH SEDGE, aka Carex de Sartwell, Sartwell's Sedge, (discovered by Henry Parker Sartwell, 1792-1867, American botanist)
Habitat: Moist to wet meadows, open swamps, shallow water; wet meadows. Calcareous wetlands (Swink, 1990) Moist calcareous meadows. Low wet prairies and calcareous meadows, creek and river bottoms, marshes, dunes, peaty swamps, open cold bogs (rhm02). distribution Occasional in the n. ½ of Illinois, also St. Clair and Washington cos.
Culture: Fall plant, light.
Description: general form Plants slender, plants 2-6 dm tall, forming dense bright green beds 1-10 m across roots rhizomatous culms 2-6 dm tall, or 2-3', almost solitary culms scattered along coarse black rhizomes, pseudo culms numerous, tall slender leaves strongly aphyllopodic, leaves 1.5-4.5 mm wide sheaths green striate (vertical stripes) on all 3 faces and slightly prolonged at apex above blade (into a collar) heads inflorescence 1-3 cm long, of 6-30 crowded spikelets, upper ones progressively smaller spikes spikelets all similar, short sessile, crowded near culm apex, brown pistillate scales 3.5 mm x 1.5 mm perigynia small, brown, ovate, flat short beaked, 2.5-4.5 mm long, 4-9 nerved on convex inner face, spongy at the base stigmas 2 N 2n = 62.
Comments: Blooms 4-5. Calcareous, 824,720 seeds per pound. *C. pellita* plugs are often sold as *C. sartwellii*. Overall limited commercial availability, often seasonal.

This species is sometimes confused with the rare European adventive, *C. disticha* Hudson (Catling et al, 1988). *C. disticha* has more prominent spikes, reddish-brown pistillate scales, and longer and wider perigynia, 4-5.5 mm, with beaks, 1-2 mm, about as long as the body.

"Uncommon. The boggy places in Kent and Coon Creek bottoms, the low prairies west of Yale bridge and south of Killbuck and in like situations in DeKalb, Ogle, and Stephenson counties." (Fell 1955) A northern sedge found in wet prairies and slough borders (Fell 1959).

Carex scoparia Schkuhr ex Willdenow BROOM SEDGE, aka *Carex à balais,* Lance Fruited Oval Sedge, Blunt Broom Sedge, Pointed Broom Sedge, Pointed Marsh Sedge (*scoparius -a -um* broom or sweeper, broom-like, from Latin *scoparius*, sweeper, broom, a sweeper, from Latin *scopa*, broom, for the many stramineous culms resembling broom straws, or for for resemblance of tufts of stems to a crude broom.)
Habitat: Wet meadows; very common in open wetlands, sandy lake shores, and fields, moist calcareous prairies. Common in wet prairies, also in calcareous fens and moist calcareous prairies. Wet open woods, wet prairies, wet meadows, seeps, calcareous fens. "Wet to dry, open habitats, usually on acidic, often sandy soils." (fna) "Bogs, swamp forests, marshes, seepy ledges, ditches; common." (Weakley 2008) Swamps and moist to dry, open ground (ecs). "Common in such boggy places as south of Rock Cut, Coon and Kent Creek bottoms, and the prairie west of Yale Bridge." (Fell 1955) Sedge of wet places, irregularly distributed but abundant where found (Fell 1959). Shade tolerant. No drought tolerance. Low salt tolerance. pH 4.6-6.9. distribution Common throughout Illinois.
Culture: Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). Grows well in greenhouse with no treatment. Easy from dry stored seed, dry storage 70 (180)-light. Self sows prodigously in rich, open ground (*in situ* 200 bu. Corn Belt soils, not urban bulldozer smear) (gni).
Description: general form Plants densely caespitose roots 8" minimum root depth culms without pseudoculms slender, 1-15 dm tall, 1-5 dm tall, 1.5-3.5', 8" to 36" leaves blades 1-4 mm wide spikes spikelets all alike, short sessile, tapered to an acute point at each end, 12-14 mm long, crowded or remote on the culm, staminate flowers confined to tapering spikelet bases pistillate scales 3.5 x 1 mm perigynia less than 2 mm wide except rarely in *scoparia*, perigynia thin and scalelike, with translucent margins or wings, wind dispersed, mostly appressed, and all or all but the beaks hidden by the scales, becoming brown at maturity; 5.5 x 2 mm, incurved, broadest at or above the upper end of the achene, lanceolate to narrowly rhombic, (3X as long as wide, appearing depressed over achene on inner face stigmas 2 N 2n = 56, 58, 60, 68.
Comments: Blooms 5-6. Common plants, wetland restoration, calcareous, bunching. Fell (1959) notes the species is subject to vegetative variations. 1,096,618 to 1,759,689 seeds per pound.
Associates: Two of two plants analyzed by Miller et al. (1999) were mycorrhizal, having vesicles and hyphae. Provides food and cover for songbirds, ruffed grouse chicks, ducks, and moose.

Carex shortiana Dewey SHORT'S SEDGE (discovered by Charles Wilkins *Short*, 1794-1863, physician and botanist)
Habitat: Seasonally inundated, wet woods, dry savanna. The heads of ravines running into Lake Michigan, springy areas. Mesic woods, bottomlands, at the head of ravines, wet meadows. distribution Common in the s. ½ of Illinois, occasional to rare elsewhere.
Culture: 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify-light
Comments: Blooms 5-6. Landscaping, attractive brown seed heads. 250,898 to 444,400 seeds per pound. The first place I ever saw this sedge was an open wooded, high and dry hill in Springdale Cemetery in Peoria. "It is notable among tristigmatic carices in having all the spikes gynecandrous, the lateral ones conspicuously repeating the pattern of the terminal spike." Theodore S. Cochrane, 2002, Carex Linnaeus sect. Shortianae, Flora of North America vol. 23.

Carex sparganoides Muhlenberg ex Willdenow BURR-REED SEDGE, aka Bur Sedge, *Carex faux-rubanier,* Loose-Headed Bracted Sedge (*sparganoides* like sparganium, from *Sparganium*, and Greek *–oides,* with the form of, for the resemblance of the inflorescense to bur reeds.)
Habitat: Maple basswood forests. Woodland or forest sedge. Beech and sugar maple woods, degraded woodland remnants. Dry to moist deciduous or mixed forests. Dry or moist woods (rhm02). In New England rich woods (afne). Neutral or basic soils. distribution Scattered throughout Illinois.
Culture: 60 days cold moist stratification (pm 09).
Description: general form Similar to *C. convoluta* (see *C. rosea*), but plants much more robust, caespitose culms to 6 dm tall leaves 5-9 mm wide sheaths friable, whitish, cross puckered spikes spikelets short, sessile; staminate flowers at apex of each spikelet, a tiny club-shaped mass of whitish scales remaining after anthesis, perigynia 12-40 per spikelet pistillate scales 2.5 x 1.5 mm perigynia 4 x 2 mm, plano-convex, ovate, nerveless on flat face except, green at maturity, but becoming yellowish to red when dehiscing stigmas 2 N 2n = 46, 48.
Comments: Blooms 5-6. 453,600 seeds per pound. According to Fell (1959), it persists for many years after the removal of the forest. "A late flowering, stiff, thin stemmed sedge of woods and roadsides which has an interrupted inflorescence." (Fell 1955) "A common, robust distinctive looking sedge having one or a few stiff stems, an interrupted head and lax leaves mostly clothing the base of the stem." (Fell 1959)

Carex sprengelii Dewey ex Sprengel (or just Dewey) LONG-BEAKED SEDGE (common name used by Fell 1959), aka *carex de Sprengel*, Sprengel's Sedge (*sprengelii* after Kurt (Curt) Polykarp Joachim *Sprengel* (1766-1833), Prussian (Pomerania) botanist and physician.)
Habitat: Seasonally wet savannas, moist woods, on terraces and near streams, dry savanna, sandy thickets; moist woods and steep banks, wooded terraces, rich wooded ravine slopes. "Conspicuous plant that grows in large patches in upland woods (Fell 1959). Moist woods, wooded terraces (rhm02). In New England rocky woods, alluvial thickets, river terraces, often in calcareous soil (afne). distribution Common in the n. ½ of Illinois, also Washington Co.
Culture: Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). Needs moist stratification, often less than 1% germination without cms. Fall plant or cold moist stratify, light.
Description: general form Forming dense tussocks or fairy rings 1-5 dm across culms 1.5-2.0' leaves abundant, yellow green, 2-4.5 mm wide, old leaves forming copious tufts of gray brown fibrils at base of plant pistillate scales 6 x 1.5 mm perigynia 6 x 2.5 mm 5-7 mm long, with abrupt linear beaks long as the globose body N 2n = 42.
Comments: Blooms 4-5. Landscaping, ornamental, bunching, calcareous. 157,420 to 254,342 seeds per pound. "An early and conspicuous sedge common in woods and on roadsides. (*C. longirostris* Torr.)" (Fell 1955)
Miller et al. (1999) found *Carex sprengelii* to be non AM mycorrhizal, with a dense covering of root hairs (without bulbous bases). Zero of four plants analyzed by Miller et al. (1999) were mycorrhizal.

Carex squarrosa L. *MI, OH SQUARROSE SEDGE, aka Narrow-Leaved Cat-Tail Sedge (*squarrosus -a -um* rough, scurfy, with protruding scales, with leaves spreading at right angles, with parts spreading, or even recurved at the ends, Latin *squarrosus*, rough, scurfy, for the overall rough-looking appearance of the spikelets, with widespreading perigynia beaks.)
Habitat: Morainic depressions and upland swamps, wooded terraces of till plain streams, upland swampy depressions. Streambanks, moist woods, and marshes (ecs). Low woods, swamps, along streams, wet meadows (rhm02). Shade tolerant. No drought tolerance. No salt tolerance. pH 5.6-7.3. distribution Scattered throughout Illinois but more commmon in the s cos. A southern sedge, in the Bebb collection (Fell 1959).
Culture: 60 days cold moist stratification (pm 09). Remove perigynia, cold moist stratify (60 to 90), light. (Cold moist stratification, light KS BPN). Somewhat inflated peryginia, hull seed or very light cover with milled soil or seed will not hydrate.
Description: general form bunch type roots 8" minimum root depth. culms 1-3' N 2n = 56.
Comments: Blooms 5-6. 200,353 to 348,160 seeds per pound. In rich soils with irrigation, it seems to tolerate full sun quite well. Very ornamental, needs support.

Carex sterilis Willdenow DIOECIOUS SEDGE, aka Common Tufted Fen Sedge, Fen Star Sedge, Sterile Sedge (*sterilis* sterile, infertile, from the Latin *sterilis*, unfruitful, for the frequent staminate inflorescences)
Habitat: Wet places, fens and wet limey sands. Mostly in wet, very acid or very alkaline soils in the sun. Characteristic tufted sedge of marly or mineral soil seeps and fens and of calcareous springy meadows (Swink & Wilhelm 1994). Wet meadows, fens, marly seeps (rhm02). In New England wet, calcareous soils (afne). "always in very wet places and is known from Winnebago, Boone, and DeKalb Counties." (Fell 1959). distribution Confined to the n. ½ of Illinois; also Coles. St. Clair, and Washington cos.
Culture: Cold moist stratify 60 days or fall plant, light (Wade). 60 days cold moist stratification (pm 09). Cold moist stratify, light.

Description: general form Similar to *C. interior*, forming larger, denser, more wiry tussocks; plants small, slender, caespitose stems tufted culms angles scabrous above leaves 1-3 mm wide sheaths aphyllopodic heads often dioecious spikes spikelets all similar, sessile, as broad as long, with staminate scales at bases, spikelets mostly 4 per culm pistillate scales acute, 2 x 1 mm perigynia 2.5 x 1.5 mm, divergent or reflexed, giving spikelet a star shape when viewed from above perigynia more broadly ovate and reddish, beak half to as long as the triangular body.
Comments: Blooms 4-5. Calcophile, 1,040,000 seeds per pound.

"Much like the above (*C. interior*) and found, though less commonly, in the same places. Plants that are entirely staminate or entirely pistilate are occasionally found and are confusing. It is also found in Boone and DeKalb counties." (Fell 1955) "This resembles *C. rosea* and also *C. interior***.** Much less common than the former and perhaps more common than the latter to which it is related." (Fell 1959)

Carex stipata Muhlenberg ex Willdenow OWL-FRUIT SEDGE, Awl-Fruited Sedge, Awl Sedge, *Carex stipité,* Sawbeak Sedge, Soft Sedge, Spongy Sedge, Stalkgrain Sedge, Stalked Grain Sedge (the weak sucullent stem), and last and least, Common Fox Sedge, a very bogus, or at least a very confusing, name. (*stipatus -a -um* from Latin *stipatus*, compressed, surrounded, for the easily compressed culms. It is also accurately translated as crowded, from Latin *stīpāt-* participle stem of *stīpāre*, to crowd, to accompany in crowds, a possible reference to the crowded spikes. See the verb *stipo stipare*, meaning to press closely, compress; to crowd a place; to press round a person, accompany, attend.)
Habitat: Common sedge of wet places. Low, open ground, wet ditches, wet meadows, bogs; in all types of wetlands; prefers moist soil. Wet meadows, marshes, swamps, fens, wet ditches, bogs (rhm02). Partial to full sun. Shade tolerant. Low drought tolerance. Tolerates inundation to 6", tolerant of some water level fluctuations. Nutrient load tolerance high. Salt tolerance low to moderate. Siltation tolerance moderate distribution Occasional to common throughout Illinois.
Culture: Fresh seed not necessary, germinates well from dry stored seed and spring sown with no treatment, ranging from 77% to 92% germination, cold moist stratification increases germination very little (gni). Others say fall plant or cold moist stratify, light. Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09). "Sow fresh, fall sow, or cold moist treatment. Light cover. Excellent germination." (mfd 1993). Clump forming species, plant plugs on 1-1.5' centers. In seed mixes plant up to 0.125 pls lb per acre (USDA 1997).

Our 2006 crop seed had 91% germination 2% dormancy, just weeks after harvest. It may potentially germinate the same year it is produced.
Description: general form Perennial sedge, caespitose, forming solid clumps 2.0-3.0 roots 8" minimum root depth. culms stout, but thick and flaccid, easily compressed and crimped, 2-4 mm wide, often 2 mm or more wide a couple of centimeters below the inflorescence triangular, soft, septate, scabrous, 16" to 4' tall leaves blades lax, 4-10 mm wide septate, the middle and upper ventral bands becoming rugose-puckered, thin and easily torn at the summit sheaths *cross-wrinkled,* and easily broken on inner side as in *C. vulpinoidea* heads inflorescences 1.5-10 cm long spikes spikelets several, in a dense, spiciform panicles 2-10 cm long, inflorescense compound, of many tiny crowded sessile spikelets, each group of which resemble a single spikelet pistillate scales 2.5 x 1 mm, ovate; acute, acuminate, or cuspidate; about equaling the base of the beak perigynia spreading or ascending, 5 x 1.5 mm, 3.5-5 mm long, beak 2.5 mm, plano convex, nerveless on the flat face, strongly few nerved on both faces, 3-8 mm long, lanceolate, shiny green to brown, pale, inflated, with green, serrulate beak as long or longer than the body, *spongy thickened at the base,* maturing in June N 2n = 52 (48 in Japan) key features thick soft stems are distinctive.
Comments: Blooms 4-5. Wetland restoration in upper shoreline zone and vegetated swales, Attractive light green foilage. Provides food and cover for wildlife. Provides food for sora and yellow rails, swamp sparrows, tree sparrows, snipe and other song birds. Calcareous 498,901 to 663,743 seeds per pound.

"A common, rather late sedge that is easily recongized by its thick soft stems, friable sheaths and the yellow green color of the soft leaves. There is a marked variation in the size of the plant, width of the leaves, etc." (Fell 1955)

Seven of seven plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, and hyphae.

Carex straminea Willdenow ex Schkuhr (or just Willdenow?) *IN, MI AWNED OVAL SEDGE, aka Eastern Straw Sedge, Straw Colored Sedge, Straw Sedge (*stramineus -a -um* straw-colored, like straw, from Latin *stramineus*, made of straw, straw-colored, for the color and texture of the plant)
Habitat: Pin Oak savannas, peaty prairie zone around acid bogs. Low wet areas. Wet savannas, also along a railroad (rhm02). In New England swamps, fresh water marshes, meadows, swales, in sandy or peaty, acidic soils (afne).
distribution Rare in Illinois, Menard, Ogle, and Winnebago cos.
Culture: Germinated well in green house from 2 year old dry stored, refrigerated seed with no treatment. Genesis seed tests indicated that 2006 crop year was totally dormant (zero germ, 90% dormant) while 2007 crop seed from the same plants *and hulled* was totally nondormant (94% germ, zero dormant). 2009 crop in the hull was 4% germination, 87% dormant. (gni no date) Curbstone data indicates there are germination inhibitors in the perigynia of this species.
Description: N 2n = 74.

Comments: Blooms 6-7. 1,164,103 1,876,033 seeds per pound. "Uncommon. Sandy roadsides south of Rock Cut and north of Shirland; the C. B. & Q. right-of-way south of Killbuck Creek. Striate sheaths, awned scales and a flexuous inflorescence characterize this species." (Fell 1955)

Δ Carex stricta Lamarck COMMON TUSSOCK SEDGE, aka Hummock Sedge, Meadow Sedge, Prairie Sedge, Sedge, Tussock Sedge, Upright Sedge, Uptight Sedge (*strictus -a -um, -strictus* strict, upright, erect, tight, rigid, from Latin *strictus*, drawn tight, bound up, maybe from the fibrilose lower sheaths appearing as laced together)
Habitat: Characteristic of prairie sloughs, but also found in other wet areas. Abundant species, conspicuous or dominant in respective habitats, fens-wet meadows; open acid or alkaline peaty shores and meadows, often where water levels fluctuate slightly (Fassett). One of the most common marsh and wet meadow sedges. Swamps, streambanks, and wet meadows (ecs). Sedge meadows, fens, marshes (rhm02). In New England swamps, shores, meadows (afne). Shade tolerant. Low drought tolerance. No salt tolerance. pH 3.5-7.0. distribution Occasional to common in the n. ¾ of Illinois, apparently absent elsewhere. Considered an Ice Age relict in Missouri.
Culture: Good seed is hard to find. Good seed germinates so-so (≈30% tops) in greenhouse with no treatment (gni). Fresh seed is not necessary. Fall plant or cold moist stratify, light " Sow fresh, fall sow, or cold moist treatment. Light to very light cover. Very good germination" (mfd 1993). Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification (pm 09).
Description: general form Plants usually forming very dense tussocks, but occasionally in uniform stands; 1.5-3.0' on mounds of peat to 2 dm high roots 18" minimum root depth culms to 3'; bases slender, reddish, pinnate-fibrillose leaves slightly M-shaped, long and slender 2-4.5 mm wide, wiry, stringly glaucous toward the tips when young, later green, *lowest leaves reduced to bladeless sheaths, which split ventrally, becoming pinnately fibrillose* sheaths ligule acute, as high as wide, longer than width of blade forming sharp "V" spikes inflorescence arching, with 3-9 slender, many flowered pistillate spikelets below several slender staminate pistillate scales purplish rounded scales are usually longer than the perigynia, but rarely much shorter perigynia ascending, ovate, longer than broad when young, somewhat flattened, 2-3 mm long1-1.6 mm wide, pale green becoming brown when falling, faintly nerved, 2 nerved, but never 3 nerved, *sometimes aborted by fungi* achenes flattened stigmas 2 N 2n = 68.
Comments: Blooms 4-6. Bunching, plants often forming dense tussocks, also spread by elongate rhizomes. Tussocks are formed by vertically growing rhizomes! In wetland restoration, this species is grossly over specified in totally inapropriate habitats. It is a conservative, clean ground-water sedge, not a ditch weed as it is used. Provides food and cover for wildlife. 848,000 to 1,135,000 seeds per pound. " A very common hummock forming sedge found in marshes and other wet places throughout the county." (Fell 1955) " It is the most common member of the group which includes *C. haydenii, C. emoryii,* and *C. substricta*." (Fell 1959)

C. stricta is considered nonmycorrhizal and has bulbous-based root hairs. The unusual root hairs may represent an adaptation for nonmycorrhizal growth. (Miller et al. 1999) Zero of thirteen plants analyzed by Miller et al. (1999) were mycorrhizal.

Carex swanii (Fernald) Mackenzie DOWNY GREEN SEDGE, aka *Carex de Swan,* Hairy Savanna Sedge, Swan Sedge, Swan's Sedge, (*swanii* for Charles Walter (Wally) *Swan*, 1838-1921, a naval surgeon and early member of the New England Botanical Club)
Habitat: Dry woods and fields (ecs). Dry, mesic and wet mesic savanna; dry sand (Fassett). Black Oak savanna and hydromesophytic swamp forests of the Lake Michigan dunes. Savannas, dry woods, swamp forests (rhm02). In New England woods, often dry, thickets, clearings (afne). "An eastern plant that is often found in Indiana but which is rare in Illinois. It grows on the edge of a prairie slough on the Nimtz farm near Rock Cut Forest Preserve in Winnebago County." (Fell 1959). distribution Scattered throughout Illinois but not particularly common.
Culture: Fall plant or cold moist stratify, light. Difficult.
Description: general form Plants caespitose, tufted from short rhizomes, erect to spreading culms 1.5-3', reddish purple at the base leaves pubescent, 1-4 mm wide spikes bracts usually sheathless, spikelets usually crowded near culm tip, short, cylindrical, erect, terminal spikelet pistillate at tip pistillate scales 2 x 1 mm perigynia 2 x 1 mm small green; pubescent N 2n = 54.
Comments: Blooms 5-6. 686,760 seeds per pound.

Carex tenera Dewey MARSH STRAW SEDGE, aka Flexed Sedge, Narrow Leaved Oval Sedge, Remote Sedge, Quill Sedge, (*tener, tenera* slender, tender, soft, from Latin *tener*, soft or tender, probably from the weak appearance of flexed, slender inflorescence axis)
Habitat: Wet to mesic savannas and nearby prairies, Swampy depressions, mesophytic bluffs; (Mohlenbrock, 1999). Wet to mesic savannas and near by open areas, swampy depressions. Floodplain woods, wet meadows, mesic prairies, swampy depressions, wet ditches (rhm02) "Uncommon sedge of prairie roadsides and edge of woods…" (Fell 1959).
distribution Occasional to common throughout Illinois.
Culture: 60 days cold moist stratification (pm 09).
Description: general form Common plants, caespitose, slender, 1-15 dm tall culms without pseudoculms leaves blades narrow, 1-4 mm wide spikes staminate flowers confined to tapering spikelet bases spikelets all alike, short

sessile, spikelets remote on arching zigzag culm, markedly moniliform inflorescence perigynia ovate, 2-2.5x as long as wide, 4.5 x 2.5 mm, 3-4 mm long, 1.5-2 mm wide, rather long beaked, nerved on inner face less than 2 mm wide, thin and scale-like, with translucent margins or wings, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2 N 2n = 52, 54, 56.
Comments: Blooms 5-6. 320,000 to 936,082 seeds per pound. "Common in damp and dry open places, usually the edge of woods and on prairies. The moniliform head is usually nodding." (Fell 1955) "Often called *C. straminea.*" (Fell 1959)???
Associates: *C. tenera* is considered nonmycorrhizal and has bulbous-based root hairs. The unusual root hairs may represent an adaptation for nonmycorrhizal growth. (Miller et al. 1999). Zero of two plants analyzed by Miller et al. (1999) were mycorrhizal. Seeds are wind dispersed.

Carex texensis (Torrey ex L.H. Bailey) L.H. Bailey TEXAS SEDGE (*texensis* Texan, of or fromTexas, USA.)
Habitat: Occasional as a lawn weed, rocky or sandy woods, mesic-dry. Disturbed soil, particularly in lawns and cemeteries (rhm02). distribution Rare and scattered in Illinois, apparently absent from the n. 1/3 of Illinois.
Culture: Cold moist stratify, light (Code C, D Ken Schaal).
Description: general form caespitose culms slender, taller than the leaves, smooth leaves up to 1.5 mm wide sheaths pale green, lower stramineous to brown heads spikelets 2-8 spikes androgynous, moniliform spikes 0.5-3 cm long pistillate scales ovate, surpassing the base of the beak perigynia plano-convex, lanceolate, 2.5-3 mm, smooth margined, widely spreading to deflexed, *spongy-thickened at base, the spongy portion* to 1 mm long stigmas filiform, longer than the beak.
Comments: Blooms 4-6. Known from Springdale Cemetery, Peoria. 384,000 to 800,000 seeds per pound.

Carex torta Boot ex Tuckerman (or F. Boott) * GA TWISTED SEDGE, aka Beaked Riverbank Sedge, *Carex tordu*, Streambed Sedge (Latin *tortus*, a twisting, winding, for the short twisted beak of the perigynia.
Habitat: In and along streams, often in rocky streambeds subject to continuously flowing water. Along and in streams (rhm02). In New England streambanks (afne). distribution Southern 1/4 of Illinois and Whiteside County (rhm99). Presumably along banks of Kankakee River in Lake County, Indiana (Swink & Wilhelm 1994)
Description: perigynia Distinctive nerveless perigynia, with small twisted beak and purple black pistillate scales with hyaline margines (Mohlenbrock 1999) N 2n = 66.
Comments: Blooms 4-6. Fruiting 6. An early maturing, diminutive *C. stricta*-looking sedge. 807,829 to 822,464 seeds per pound.
Significant potential in erosion control, but the genotype Nazis won't use it, but they cheerfully embrace the biogeographical atrocities of some nurseries with colorful catalogues. Perhaps if we showed a few color photos …

Carex tribuloides Wahlenberg (Val. in rhm02) AWL-FRUITED OVAL SEDGE, aka Bristlebract Sedge, Blunt Broom Sedge, Tufted Marsh Sedge (*tribuloides* from Latin *tribulus*, three-pointed, a caltrop, from Greek *tribolos*, any of various prickly plants, athreshing board studded with spike, and *-oides,* with the form of. Alternately *tri*, 3, *bulbus* , bulb, and *-oides*, like, resemble.)
Habitat: Wet meadows and wet woods. Alluvial wetlands, upland swamps, peaty marshes, flat peaty fens, wet prairies, wet woods and moist meadows; river floodplains and oxbows. Hummocks and rotted logs on higher river terraces. Swink & Wilhelm, 1994 notes its range is nearly identical with the closely related *C. projecta*, but *C. projecta* is mostly in mesophytic woods and *C. tribuloides* is more often in open, peaty marshes and wet prairies. Wet woods, swamps, wet ditches, peaty marshes, swales, wet prairies, wet meadows, peaty fens, oxbows, shores of lakes and ponds (rhm02). Shade tolerant. Low drought tolerance. No salt tolerance. pH 4.8-7.0 distribution Common throughout Illinois.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Fall plant or cold moist stratify, light.
Description: general form Somewhat larger plants with slender pseudoculms, less robust than *C. muskingumensis,* 1.5-3.0', plants caespitose, tufted roots 8" minimum root depth culms slender, 1-15 dm tall, to 3' leaves 2-10 mm wide sheaths aphyllopodic heads inflorescence stiff, rather crowded, spikelets 6-12 mm long, blunt all alike, short sessile spikes staminate flowers confined to tapering spikelet bases perigynia 5 x 1.5 mm, incurved-adpressed, lanceolate, 3X long as wide, broadest above type of achene, the marginal wing slightly but abruptly narrowed above the middle thin and scale-like, with translucent margins or wings, less than 2 mm wide, mostly appressed and all or all but the beaks hidden by the scales, becoming brown at maturity stigmas 2.
Comments: Blooms 5-6. Wind dispersed. Wetland restoration, provides food and cover for wildlife. Closely related to *C. projecta,* which is typical of mesophytic woods, while *C. tribuloides* is of open peaty marshes and wet prairies (Swink & Wilhelm 1994). 1,565,517 to 1,790,927 seeds per pound. George Milner at V3 reports this fairly reliable from dormant seedings in the field. *Carex tribuloides* has overwintering vegetative stems that produce new shoots at the nodes. (Ball & Reznicek 2002) "A rather common sedge of wet places which matures late." (Fell 1955) "Matures late. The numerous long, leafy sterile stems develop after flowering time." (Fell 1959).

Carex trichocarpa Schkuhr (or Muhlenberg ex Willdenow, of just Muhlenberg, or in AFNE Willdenow.) *In-Mi or *CT, MA HAIRY FRUIT SEDGE, aka *Carex à fruits velus*, Hairy-Fruited Lake Sedge, Rigid Sedge (*trichocarpus -a -um* hairy-fruited, bearing hairy fruit, from Greek τριχος, *trichos*, a hair, and καρπος, *karpos*, fruit.)
Habitat: A common slough sedge, seldom fruiting. Wet meadows and sloughs, mesic savanna, marshes and wet meadows. Shallow water and wet soils, calcareous soils. Open stream valleys and low prairies. Moist calcareous meadows and sloughs, moist thickets, and seeps. Calcareous meadows, sloughs, seeps, marshes (rhm02). In New England calcareous marshes, bottomlands and meadows (afne). Tolerant of fine and medium textured soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.7-7.0. distribution Ocassional to frequent in the n. ½ of Illinois; also Washington Co.
Culture: Seed rarely and unreliably available, clone (gni). 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify, light, or cloning. Growth rate rapid. Seedling vigor low. Vegetative spread rate none according to the USDA, *but it spreads quickly and aggressively underground, forming large clones.*
Description: general form Very similar to *C. atherodes,* coarse aggressively rhizomatous sedges, forming large monotypic dense non-flowering beds of slender pseudoculms, 5-10 dm tall, to 10 m across culms numerous pseudoculms 0.5-1.5 m high, usually taller than the fruiting culms, bases reddish and pinnate fibrillose leaves 4-7 mm wide, M-shaped sheaths mouth of sheath is deeply concave with a *deep purple (reddish) V (or blotch) on the side opposite leaf blade*, (one of the few carices you can ID vegetatively, but *C.* X *subimpressa* is similarly marked) heads spikelets ascending, cylindrical, 2.5 cm long, scattered on erect culms, the lower 1-4 pistillate, the upper 2-5 staminate pistillate scales acute, 3.5 x1.5 mm perigynia 7 x 2 mm, beak 3 mm long, or beak 6-9 mm long, teeth 2 mm, ovoid, somewhat inflated, short-white-hairy (pubescent) stigmas 3 N 2n = ? key features according to Fell (1959), the bright purple sheath mouth and *the frequent absence of fruiting stems* are distinctive.
Comments: Blooms 5,6. Wetland restoration. Many colonies do not produce crops every year, good seed crops every 3-5 years if you are lucky. 378,000 seeds per pound. "A common wet soil sedge that fruits in early June. The spikes are graetly overtopped and hidden by the long leaves. Large patches are often completely sterile. The purple sheath mouth is distinctive." (Fell 1955)

Carex tuckermanii Dewey (or Boott.) *CT, IL, MD, MA, NJ TUCKERMAN'S SEDGE aka Bent Seeded Hop Sedge, *Carex de Tuckerman* (Edward *Tuckerman*, 1817-1886, American botanist and lichenologist)
Habitat: Plant of the northern wet woods. Upland glacial depressions in mesic savannas; wet hollows and meadows, floodplain forests. Streambanks, moist woods, and marshes (ecs). "Upland depressions in wet savannas"?, or should it be wet depressions in upland savannas (rh02). In New England meadows, shores, swamps (afne). distribution Rare, confined to the northeast corner of Illinois; also Hancock Co.
Culture: Cold moist stratify for 60 days or fall plant, needs light, sow on soil surface (Wade). 60 days cold moist stratification (pm 09). Germination moderate, should remove perigynia or give light cover. Germinates sporadically in greenhouse w/o cold stratification. (gni)
Description: general form Bunch type spreading from short rhizomes culms forms large tussocks, culm 1-3' leaves w/ many long leaves 2-6mm wide spikes pistillate short to long-cylindrical, often arching, scattered on the culm perigynia 7-10mm long, 4-6 mm wide, often more than 5 mm broad, broadly short-ovoid, shiny, becoming light brown achenes unsymmetrical, *invaginated on one side* (as if collapsed), "bent", or with a dent in one side.
Comments: Blooms 4-6. Fruiting 6-8. Wetland restoration, provides food for wildlife. 60,000 to 87,885 seeds per pound. The ripe seed head looks like a shiny brown hornworm. Specimens are in the Bebb collection in Rockford College and Chicago Natural History Museum (Fell 1959).

Carex typhina Michaux * CT, ME, MA, MI, NY, PA CATTAIL SEDGE (*typhina* like *Typha* from the resemblance of the pistillate spikelets to cattails.)
Habitat: Moist or wet woods, marshes, fens. Deciduous floodplain forests of large rivers (Fassett). Bottomland woods. swamps, wet meadows (rhm02). In New England shores, meadows, wet woods (afne). Tolerant of fine and medium textured soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 5.7-7.0. distribution Occasional in the s. ½ of Illinois, usually infrequent elsewhere.
Culture: Cold moist stratify or fall plant (Wade) 60 days cold moist stratification (pm 09). Growth rate moderate. Seedling vigor low. Vegetative spread rate none.
Description: general form Very similar to *C. squarrosa*. culms densely tufted, ≈ 5 dm tall leaves 5-9 mm wide, upper leaves taller than stems perigynia 30-60 per spikelet, divergent, inflated, the body obovoid, abruptly beaked
Comments: Blooms 6-9. 224,000 to 652,299 seeds per pound. Oberved by Wilhelm in the fen area of Hartz's wetland, west Bureau County, down by the Green River, ...

Carex utriculata Boott. COMMON YELLOW LAKE SEDGE, aka Beaked Sedge, Northwest Territory Sedge (*utriculatus -a -um* with a small bladdery one-seeded fruit, bladder-like from Latin *utriculatus*, shaped like a little bag,

from Latin *utriculus* small bag diminutive of *uter* leather bag, for the perigynia. Utricle is a European term for perigynia.)
Habitat: Marshes and shallow water, acidic areas of bogs, minerotrophic borders of bogs. Marshes, bogs, sometimes in standing water (rhm02). In New England swamps, marshes, meadows, bogs, shores (afne). distribution Occasional. Not common, confined to northeast Illinois; also St. Clair Co.
Cultivation Clone, cold moist stratify. Sporadically in the trade, difficult to find at best.

David E Steinfeld (2002), using seed from the high Cascade Mts, placed seed in linen bags in cool running water for 2 days and layered bags between shagnum moss @ 35° F for thirty days. Emergence was within 10 days. Daytime temperatures were between 90º and 95ºF and nighttime temperatures were 70F. Seedlings were placed in a cattle trough in a dilute solution of Excal 21-5-20 @ 100 ppm N.

Seedlings were fall planted in a constructed basin under irrigation. **When some seedlings were 1.5 feet tall, the basin was flooded. Seedlings smaller than 1.5 feet died.** (Emphasis added).
Description: roots clump forming with rhizomes and stolons (?) on perennially wet sites.
Comments: Blooms 5-6. 160,000 to 228,571 seeds per pound. Attractive foliage and seed heads. In shallow water creates important egg-laying habitat for amphibians. Can be short lived in less than ideal hydrology. Propagators store this and other carices in closed lid jars in a refrigerator @ 2 degrees C (35º F).

Carex vesicaria Linnaeus var. **monile** (Tuckerman) Fernald *MD BLISTER SEDGE, aka Bladder Sedge, *Carex vésiculeux*, Inflated Sedge, Tufted Lake Sedge (*vesicarius -a -um* Latin *vesicarius,* relating to a bladder, or a remedy for a bladder ailment, from Latin *vesca*, bladder, for the inflated perigynia, and Latin *monile,* a necklace or collar, for the beaded appearance of the pistillate inflorescence)
Habitat: Upland swamps, depressions, and wet prairies; pond edges and various wetlands. Upland swamps and depressions, wet meadows (rhm02). Moderate shade tolerance. Low drought tolerance. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance low. Shade tolerance intermediate. pH 4.5-7.5. distribution Occasional in the n. ½ of Illinois, extending southward to Lawrence, St. Clair, Wabash, and Washington cos.
Cultivation 60 days cold moist stratification (pm 09). Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate.
Description: general form Similar to *C. tuckermannii* roots mat-forming, or clump-forming by short rhizomes? 16" minimum root depth culms 1-3' leaves reticulate? spikes spikelets straight and narrowly cylindrical pistillate scales 6.5 x 0.5 mm perigynia 6.5 x 3 mm, very shiny ovoid, straw yellow, 2-3.5 mm wide, neatly arranged in a braided pattern in side view achenes straight key features the shininess of the perigynia distinguishes this species from *C. rostrata* and *C. laeviconica.*
Comments: Blooms 5-8. Wetland restoration, provides food and cover for wildlife. to 165,936 to 192,000 seeds per pound. "Uncommon. In old drainage ditches east of Sugar River Forest Preserve and west of Yale Bridge, in Coon Creek bottom and in the prairie slough south of Killbuck Forest Preserve. A widespread and variable species." (Fell 1955)

Carex vulpinoidea Michaux *the original, the one, the only and still* FOX SEDGE, aka *Carex vulpinoïde*, Common Fox-tail Sedge, Foxtail Sedge, now called by infidels BROWN FOX SEDGE (*vulpinoidea* from the English vulpine, of or like, or relating to a fox, from Latin *vulpinus*, of or pertaining to a fox, from *vulpes,* earlier *volpes* (genitive *vulpis, volpis*) fox, cognate with the Greek αλοπεχ*, alopex*. The quick brown fox sedge jumped over the lazy taxonimist.)
Habitat: Common in wet places. Wet meadows, upland swamp; in all wetlands, rarely old fields. Swamps, wet meadows, low areas, moist open ground (rhm02). In New England low, open ground, shores, meadows, marshes (afne). Prefers seasonal water depths of 6" or less, does not tolerate extended inundation, but tolerates some fluctuations. Low acid tolerance, medium salinity tolerance. Tolerant of standing water in spring and early summer. Partial to full sun. Moderate shade tolerance. Low drought tolerance. Nutrient load tolerance moderate to high, No (ecs) salt tolerance to low or moderate. Siltation tolerance moderate. pH tolerance not available. distribution Common, in every Illinois county. Naturalized in parts of Europe.
Cultivation Cold moist stratify or fall plant, light (Wade). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Readily established from seed. Seed responds to fall planting or cold dry storage. Sow on top of soil or very light cover fall plant or cold moist stratify, light. In mixes plant 0.06- 0.5 lb pls per acre (usda); alone plant 1 lb/acre in fall or spring (Ranier). Seeds, bare root plants and plugs readily available. Plant on 1.0-1.5' centers. Bare root material must be planted by the Friday before June 15, while plugs may be planted up to Labor Day. If you must plant after Labor Day, you just can't wear white.
Description: general form Perennial sedge, caespitose roots 16" minimum root depth culms 1-2 mm thick, wiry, 24-36+" leaves blades 1-5 mm wide sheaths cross-wrinkled spikes inflorescence compound, of many tiny crowded sessile spikelets, each group of which resemble a single spikelet; inflorescence 2-15 cm long, with many protruding threadlike bracts and awned scale tips perigynia 2.5 x 1 mm, green to brown, plano-convex, 1.7-4 mm long, ovate dull green to brown, flattened with 2 corky wings, beak 1/2 to 1/3 as long as body. flowers, green and brown, nerveless on the flat face stigmas 2 N 2n = 52.

Comments: Blooms 5-7. Fruiting 7-8. Bunch type, Good erosion control. Wetland restoration, useful in upper shoreline zone and in vegetated swales Good wildlife values. Provides food for sora and yellow rails, swamp sparrows, tree sparrows, snipe, and other songbirds. Satisfactory forage. Successional, bunching. 1,254,144 to 1,681,481 seeds per pound**.** "Common fox-tail sedge, growing abundantly in moist places. The leaves are longer than the stems." (Fell 1955) Eight of ten plants analyzed by Miller et al. (1999) were mycorrhizal, having arbuscles, vesicles, hyphae, and intra-radical spores.

" A delightful genus to work with—" Goodrich and Neese (1986) quoted in Hurd et al (1998).

Te audire no possum, musa sapienum fixa est in aura

CYPERUS Linnaeus 1753 **Galingale, Flat Sedge, Umbrella Sedge, Prairie Papyrus** *Cyperaceae* New Latin, from Latin *cyperos,* a kind of rush, from Greek *kypeiros,* probably of Semitic origin; akin to Hebrew *koper*, a resin. Huge genus, 600 (500-550) species from tropics to temperate zones. Many ornamental species, some house plants, water garden plants, and weeds. Some species are tuberous, many nut-like and edible, some fragrant and used in perfumery, and some Amazon species are medicinal. All have triangular stems and spikelets of flat overlapping scales. Most are easy from seed.

Cyperus erythrorhizos Muhlenberg REDROOT FLATSEDGE, aka Red-rooted Sedge (*erythrorhizos* with red roots, from *erythro*-, red, combining form of Greek ἐρυθρός, *erythros*, red, and a root**,** referring to a root, *rhizo*, from Greek ῥίζα-,*rhiza*-, root.)
Habitat: Wet ditches, Green River Lowland, mudflats of creeks and rivers.
Description: Common. Tall annual with red roots, scratchy margined basal leaves, cylindrical clusters of narrow spikelets, green ribbed reddish scales, and trigonous egg-shaped seeds.
Comments: 8,647,619 to 9,559,574 seeds per pound. "Common on the muddy banks of Rock and Kishwaukee Rivers and elsewhere over the county." (Fell 1955)

Cyperus esculentus Linnaeus YELLOW NUT SEDGE, aka Chuffa, Earth-almond, Field Nut Sedge, Ground Almond, Nut Sedge, Yellow Nut Grass, Wild Chufa (*esculen-, esculent, esculentus* Latin edible**,** esculent, fit for human food.)
Habitat: Moist fertile soils, agricultural wetlands, and lawns. Moist fields, meadows, lawns and gardens. Common plant of farmed wetlands. Tolerates seasonal or occasional flooding, up to 12". Full sun. Moderate drought tolerance. Nutrient load tolerance high. Salt tolerance low. Siltation tolerance high. pH 5.0-7.5, or pH 5.0-7.0 (ecs). Distribution nearly worldwide.
Culture: No treatment. Anon. 1981 recommends 25 lbs. (tubers)per acre drilled in between April 1 and June 15. Ernst recommends 40 lb planted alone. Generally available as tubers, or transplants, not as seed. Grows easily from seed on moist soil. Drawdown said to stimulate new growth from tubers.
Description: Short-lived perennial sedge, 1-2', 8" to 3', stoloniferous, bearing tubers. 10" minimum root depth.
Comments: Aggressive. Yellowish flower in mid-July to August. Achenes seldom maturing. Useful for urban stream bank stabilization. "Common in low meadows or other wet places." (Fell 1955)
Associates: Seeds are eaten by waterfowl and other critters. Waterfowl eat rhizomes. Waterfowl, upland game birds, and songbirds eat the seeds and tubers. Terrestrial furbearers (esp. squirrels) and small mammals eat tubers. Provides cover for reptiles, amphibians, and small mammals.

Cyperus schweinitzii Torrey ROUGH SAND SEDGE, Crowfoot Sedge, Crowfoot Cyperus, Great Plains sand sedge, Schweinitz's cyperus, Schweinitz's flat sedge (*schweintzii* after Lewis David von Schweinitz, 1780-1834.)
Habitat: Sand prairies and sandy savannas
Culture: Seeds germinate after a period of cold, moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Light, cold moist stratify or fall plant.
Description/comments: 0.5-2.0' Blooms 6-8. Bunching. 880,000 seeds per pound. "Common in Sugar River sand areas and on the sand prairies about Camp Grant and to a less extent on high prairies." (Fell 1955)

DULICHIUM Persoon **Threeway Sedge, Duliche** *Cyperaceae Dulichium* from the Latin *Dulichium*, *Dolicha*, from Greek Δολίχη, *Doliche*, a city or an island of the Ionian Sea, southeast of Ithaca, belonging to the kingdom of Ulysses, or Latin *dulichium*, a kind of sedge. According to Homer, Dulichium abounded in grass and wheat. Some sources refer to Dulichium as an ancient name for Euboia, in eastern Greek. A monotypic genus found in North America, but known from Europe as fossils. x = 15.

Dulichium arundinaceum (Linnaeus) Britton THREE-WAY SEDGE, aka Pond Sedge (*arundinaceum*, reed-like from the Latin, *arundo*, reed, cane, and *-aceus*, resembles, like.) Common name is from the alignment of the leaves.

Habitat: Bogs and marshes, swamps and sedge meadows. Bogs, marshes, lake margins, swampy fields, and ditches (ecs). Moderate shade tolerance. Low drought tolerance. No salt tolerance. pH 4.7-7.5.
Culture: 60 days cold moist stratification (pm 09).
Description: general form Erect, perennial, semi-aquatic, emergent sedge roots rhizomatous, spreading 18" minimum root depth culms 1-3', stems, stiff, round, hollow leaves narrow 2-7" long stiff, spiraling up and away from stem heads inflorescence long spikelets in 2 rows in upper leaf axils seeds brownish, beaked nutlet with fine barbed bristles key features the combination of distichous *Cyperus*-like spikelets and many, distinctly 3-ranked, cauline leaves makes this species distinct. Stems round, hollow.
Comments: Blooms 7-8. One of the easiest sedges to recognize with three-ranked leave arrangement. Provides food for waterfowl and muskrats. Waterfowl eat the achenes. Attracts moose. Look out! 1,600,000 seeds per pound.

Sic gorgiamus allos subjectatos nunc.

ELEOCHARIS R. Brown 1810 **Spikerush** *Cyperaceae Eleocharis* marsh-beauty, marsh-favor, marsh-joy, New Latin, from Greek ἑλεο- *heleo-* marsh, or *helodes*, growing in marshes, *heleios*, dwelling in marshes, and χαρις, *charis* grace, beauty, pleasant. A genus of 120-200 (200) species of aquatic and wetland herbaceous annuals and perennials, cosmopolitan. Mohlenbrock (2005) introduced the name Spikesedge since Eleocharis are in the sedge family not the rush family. Seeds are achenes. Cold moist stratification, saturated soils, light, division of mature plants of perennial species. The seeds of many species are highly dormant. Formerly given as *Heleocharis* Lestibudois, now considered an orthographic variant, but it is more etymologically accurate.

The amphibious leafless sedge *Eleocharis vivipara* develops C4-like traits and Kranz anatomy under terrestrial conditions, but it develops C3-like traits without Kranz anatomy under submerged conditions

Eleocharis acicularis (Linnaeus) Roemer & J.A. Schultes NEEDLE SPIKE RUSH, aka *éléocharide aciculaire*, Hairgrass, (*acicularis, -is, e* needle-like, like a pin or needle, from Latin *acicula*, a small pin for a head-dress, and -*aris*, from –*alis*, of, or pertaining to, needle-shaped, needle pointed, slender, for the stems)
Habitat: Seasonally inundated areas. Marshes, mudflats, exposed muddy shores forming large mats, very springy calcareous areas (Swink & Wilhelm 1994). Low wet ground (rhm02). distribution Occasional throughout Illinois
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratification, saturated soils, light, division of mature plants of perennial species. Seed cold moist stratified for 90 days germinated at 15º C. Seed dormancy is physiological dormancy (C. Baskin 2003f). Seed from Eugene, Lane Co., Oregon, fall planted with outside natural winter stratification, fair germination in 2 weeks at 70º/50º F greenhouse (Bartow 2004b).
Description: key features "Achenes distinguish *Eleocharis acicularis* from *E. intermedia.* Culm width and culm length distinguish *E. acicularis* from *E. wolfii*. Bristles may be present or absent." (ilpin)
Comments: Blooms 5-10. C3. 943,867 to 1,165,597 seeds per pound. "Common on muddy banks of Rivers, creeks, and sloughs." (Fell 1955)

Eleocharis calva Torrey BALD SPIKE-RUSH (*calvus -a -um* bare, naked, bald, hairless, from Latin *calvus*, bald, hairless, naked.) An invalid name, see *E. erythropoda.*
Description: This is actually *E. erythropoda*. 2,268,000 seeds per pound.
"Is rather common. It resembles the two preceeding (*E. palustris* and *E. smallii*) and has been treated as a variety of *E. palustris*, but is easily separated by the solitary basal scale." (Fell 1955 as *E. calve* Torr.)

Eleocharis dulcis (Burm.f.) Trin. ex Hensch. vars. CHINESE WATER CHESTNUT (*dulcis* DUL-kis *dulcis*, sweet, or any taste not acrid, for the edible tuber.)
Habitat: Canned food section of your supermarket.
Culture: Slice thinly, stir-fry, add MSG and soy sauce. It is one of the few vegetables that remain crisp after cooking, due to cross-linked cell walls that are reinforced by phenolic compounds. Eating uncooked corms may result in an infection *Fasciolopsiasis* from trematodes, large intestinal flukes up to 7.5 cm long. Take out anyone? The Water Chestnut or Water Caltrop is *Trapa natans*.

Eleocharis erythrpoda Steud. RED-ROOTED SPIKE RUSH, Bald Spike-rush, *Éléocharide à tiges rouges*, Red-Based Spikerush, (*erythrpodus -a -um* red-footed, red-stalked, with a red stem or red base, from Greek *erythros*, ἐρυθρός, red.)
Habitat: Seasonally inundated, wet meadows. One of the most common spike rushes, moist calcareous habitats, such as lake borders, marshes, and ditches, highly alkaline highway ditches and medians, sediment rich cattail marshes. Wet soil (rhm02). distribution Common in the n ½ of Illinois, rare elsewhere.
Culture: Cold moist stratification, saturated soils, light, division of mature plants of perennial species
Description: general form plants perennial, mat-forming, 0.5-2.5' N 2n = 16, 18, 19, 20 key features "large, single,

suborbicular basal scale that completely encircles the culm (ilpin).
Comments: Blooms 5-6. Fruiting summer. Tolerant of calcareous to alkaline situations wetland restoration. 737,612 to 1,176,166 seeds per pound.

Eleocharis obtusa (Willdenow) Schultes BLUNT SPIKE RUSH (*obtusus -a -um* obtuse, blunt, rounded at the apex, from *obtusus*, blunt, obtuse, from *obtundo*, to beat upon, to make blunt, dull.)
Habitat: One of the most common spike rushes, shores and moist flats, around artificial ponds, calcareous marshy ground, interdunal flats near Lake Michigan, old sandy excavations, small sandy ditches (Swink & Wilhelm 1994). Seasonally inundated, wet, muddy shores, disturbed artificial wetlands and ditches. Mudflat species, needs saturated soils. Tolerates inundation to depth of 6". Full sun. Low drought tolerance. Nutrient load tolerance moderate to high. Salt tolerance variously reported as none to low to moderate. Siltation tolerance low. pH 4.0-8.7.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Saturated soils, light. Annual, spreads by seed where there is little competition. Requires drawdown to mudflat conditions for germination. In mixes plant 0.02-0.4 pls lb per acre (USDA 1997).
Description: Almost exclusively an annual tufted herb, rarely moderately rhizomatous and short-lived perennial, 1.0-1.5', occasionally 2.0'. 10" minimum root depth. Brownish flower key features Versus the two other varieties, this one has: 1) tubercle greater than 2/3 width and 1/4-1/2 height of achene; 2) bristles mostly present, exceeding achenes. (ilpin)
Comments: Blooms 5-9. Wetland restoration, useful in upper shoreline zones, stream bank stabilization, and in vegetated swales; Roots and seeds are eaten by waterfowl. Provides food for rails, muskrats, and rabbits. Ducks and rabbits eat seeds and plants. Bunching, calcareous. 900,794 to 2,734,940 seeds per pound.
"Common on muddy river and creek banks. In Coon Creek bottom peat areas that have been plowed and are still very wet the next year, it is at times an abundant first invader." (Fell 1955)

Eleocharis palustris (Linnaeus) Roemer & Schultes MARSH SPIKE RUSH, aka Common Spike Rush, *Éléocharide des marais (palustris, palustre* marsh-living, of swamps, of marshes, or growing in bogs, marsh loving, from Latin *paluster -tris -tre* marshy, boggy.) see *E. smallii*
Habitat: Edge of swamps, sloughs, ponds, and streams (rhm02). distribution Occasional throughout Illinois.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratification, saturated soils, light, division of mature plants of perennial species.
Description: general form Erect perennial semi-aquatic, emergent sedge culms 4-40" tall, alone or in spaces clusters leaves sheaths sheaths as base of stem heads in spiral covered by brownish scales; inflorescence solitary pointed spikelet seeds gold brown nutlet with half of top covered with a cap N 2n = 16, 17, 36.
Comments: Blooms 6-9. C3. 1,156,688 to 1,600,000 seeds per pound. "It is not always easily separable from the two following (*E. smallii* and *E. calve*): the growth habit is much the same. All have lenticular achenes and a more or less oblique, herbaceous sheath orifice. This is the most common, being found in wet places over the county." (Fell 1955) Mohlenbrock maintains this name over *Eleocharis smallii* Britt.

Eleocharis smallii Britt. CREEPING SPIKE RUSH, MARSH SPIKE RUSH
Habitat: Mudflat species, needs saturated soils. pH data not available. Nutrient load tolerance low. Salt tolerance moderate. Siltation tolerance low. Full sun
Culture: Cold moist stratification, saturated soils, light, division of mature plants of perennial species. Sow seed on mudflats during drawdown conditions; Spreads underground by rhizomes and by seed where competition is reduced. In seed mixes plant 0.2-0.4 pls lb per acre (USDA 1997), but 0.125 is recommended.
Description: Grasslike perennial herb, 12-18", w/ extensive creeping rhizomes, brownish flowers.
Comments: Blooms 6-9. "It is a questionable species much like the above (*E. palustris*). It is uncommon, being found in Coon Creek bottom and in the sandy low prairie west of Yale bridge." (Fell 1955)
Associates: Seeds are eaten by waterfowl. Non-mycorrhizal.

SCIRPUS (Reichenb.) Palla **Bulrushes, Tule** (Also spelled bullrush.) *Cyperaceae* New Latin, from the classical Latin name for rush, bulrush. Bulrush from Middle English *bulrysche, bolroysche*, perhaps from *bule* bull and *rysche, roysche*, *rusche* rush. Mohlenbrock (2005) introduced the name Bulsedge since *Scirpi* are in the sedge family not the rush family. Widely distributed large genus of annual or perennial sedges bearing solitary or much-clustered spikelets containing perfect flowers with a perianth of six bristles. Fruits are achenes, wind pollinated. Waterfowl, marsh birds, shorebirds, upland game birds, and songbirds eat seeds. Aquatic furbearers eat rootstocks and aerial stems. Small mammals eat stems. Radical name changes coming, with the traditional genus split into 3-4 genera. Includes *Bolboschoenus* Palla 1905 and *Schoenoplectus* (Reichenbach) Palla 1888.

Scirpus acutus Muhlenberg (or Muhlenberg ex Bigelow) *CT, PA (new name *Schoenoplectus acutus* (Muhl. ex Bigelow) A.Löve & D.Löve) HARD-STEMMED BULRUSH, aka Great Bulrush (*Schoenoplectus* from Greek σχοῖνος, *schoinos*, a rush, reed, or cord, and *plectos*, *plektos,* plaited, twisted, woven, in reference to the use of culms in

making useful object; *acutus* acutely angled, sharp, pointed, tapering to a point, made pointed.)
Habitat: Wet meadows, minerotrophic waters, emergent in 3" to 3' depths. Fresh, acid, marl, mildly alkaline, or slightly brackish water. Marshes, shores, pond margins, swamps. Standing water to wet muddy soils. Saturated soils of fens, or up to 3' of water in marshes. Moderately fine or fine textured soils. Established plants are tolerant of semi-permanent flooding. Nutrient load tolerance low to moderate. Siltation tolerance low to moderate. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance low to moderate or high. Shade intolerant, full sun. Basic to neutral soils. Alkaline tolerant. pH variously 5.2-8.5 (usda) or 6.7-9.1.
Culture: Fall plant or cold moist stratify (90), light, saturated soils. "Cold moist treatment, or fall sow. very light cover. Good to fair germination" (mfd 1993) No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) USDA (1997) says seeds need cold wet stratification for several months then light and warm temperatures. Fresh seed can be fall planted on mudflats after drawdown. For germination the following spring. Plant 5 lb pls per acre in fall or spring for pasture or reclamation, seeded alone, in fall or spring (Granite). Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate. Spreads moderately from seed.

Seeds, bare root, and plugs readily available from commercial sources. Anon 1981 says "plant in spring or fall. ...1000 roots / acre". Plugs or bare root material in spring is favored over seeding for better establishment. Plants need to be planted at the same depth they have been growing in soft, moist soils, on 3' centers in no more than 4" of water. Bulrushes will grow into deeper water as the planting matures. It may take 3 growing seasons to develop a dense planting (USDA 1997).

Seed cold moist stratified for 84 days germinated at alternating temperatures of 25º/10ºC, with germination greater in the light than dark (C. Baskin 2003h).
Description: Stout, tall, cool-season, rhizomatous, "sod-forming" perennial emergent herb, 3.5-9.3'.
Comments: Blooms 5-9. Landscaping, wetland and riparian restoration, useful in lower shoreline zones and in vegetative swales. Established plants tolerant of wave action and water level fluctuations. 320,000 to 615,176 seeds per pound.
Associates: Provides food and cover for waterfowl and muskrats. Attracts waterfowl. Waterfowl and shorebirds eat achenes. Good nesting habitat for many species of birds and mammals, preferred nesting habitat for redhead and canvasback ducks. Provides spawning and nursery habitat for bluegills, large-mouth bass, northern pike and other fish.

Scirpus americanus THREE SQUARE BULRUSH
Culture: Seed cold moist stratified for 180 days germinated at 30º-32ºC in light. Seed dormancy is physiological dormancy. (C. Baskin 20031)

"Schuyler (1974) discusses the need to replace the name *S. olneyi* (as traditionally applied) with *S. americanus*, traditionally applied to what must now be called *S. pungens*. Because of this nomenclatural change, the interpretation of much some information and records is now uncertain." (Weakley 2008)

Scirpus atrovirens Willdenow DARK GREEN RUSH, aka Dark Green Bulrush, Green Bulrush (*atrovirens*, dark green)
Habitat: Wet meadows, wet soil. Lake and pond shores, stream banks, marshes, wet meadows. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 4.0-8.0.
Culture: Fall plant or cold moist stratify, light. "Fall sow, or cold moist treatment. May be beneficial to cold store fresh seed if not immediately sowing. Very light to no cover. Excellent germination" (mfd 1993). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Best planted outdoors in the fall. . (pm 09)
Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description: Dark green, perennial, bunch type bulrush, 2.0-5.9 '.
Comments: Blooms 6-8. Aggressive, bunching, cool season. Provides cover for wildlife. 7,038,759 to 10,436,781 seeds per pound. "Common in marshy places, var. georgianus (Harper) Fern. being the most frequent. Proliferous plants are uncommon." (Fell 1955)

Scirpus cyperinus (Linnaeus) Kunth WOOL GRASS (*cyperinus*, similar to a *Cyperus*)
Habitat: Wet meadows and swamps, wet meadows, upland swamps. Marshes, wet meadows, swamps, shores and ditches (ecs). Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 4.8-7.2.
Culture: Fall plant or cold moist stratify-light. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Best planted outdoors in the fall. . (pm 09)

Seed from Michigan's upper peninsula was stratified at 33º to 42ºF for 30 days (Schultz et al 2001).

Seed can be stored dry in ziplock bags for 6 months or cold moist for 3 to 4 months without affecting germination. Pretreat seed in ziplocks containing sphagnum at 42ºF or in cold water at 42ºF. Germination is greatest on saturated medium with green house temperatures 55ºto 100ºF. (Grabowski 2001b).

Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description/comments: 3.0-5.0', bunching. Blooms 7-9. Ethnobotanical uses, landscaping. Wetland restoration, provides food and cover for waterfowl and muskrats. 16,814,815 to 27,200,000 seeds per pound. "Common in marshy amd other low wet places." (Fell 1955)

Scirpus fluviatilis (Torrey) Gray *KY, MA, PA, TN. RIVER BULRUSH. In Illinois, excepting Chicago, this is *Bolboschoenus fluviatilis* (Torr.) Soják; (*Bolboschoenus* from Greek *bolbos*, a swelling or bulb, and *schoenos*, a rush, reed, for the presence of corms, as opposed to *Schoenus*, which has no tubers; *fluviatilis -is -e* pertaining to a river, of or from a river)
Habitat: Seasonally inundated areas, marshes, tidal (???) and nontidal, farmed wetlands, margins of streams and lakes, moist sandy shores. Shallow water marshes, sloughs, borders of ponds and bays, riverbanks. Semi-permanent to permanently flooded conditions. 2" to 30" water to moist soil. Nutrient load tolerance moderate to high. Siltation tolerance high. Anaerobic tolerance high. CaCO3 tolerance high. Drought tolerance low. Fertility requirement medium. Salinity tolerance none or low to moderate. Shade intolerant, partial to full sun. pH variously 4.0-7.5 or 7.0-9.1. distribution 37 of the lower 48 states
Culture: 90 (or 60) days cold moist stratification, or best planted outdoors in the fall (pm 09). Fall plant or cold moist stratify (90-120), light. Some say seed needs cold water treatment. Seed crops can be erratic, and seed availability may be limited some years. In mixes plant 0.06 to 0.125 lbs/ pls per acre (USDA 1997)

Tubers, bare root, and plugs are commercially available. Tubers and plugs are preferred for establishment. Plugs may sell out early. Plant tubers 2-5" deep on 1-3" centers in 1-4" of water in spring or early summer. Young shoots should not be flooded. Mud flat conditions preferred for planting. 1000 roots per acre at 1.5' intervals in up to 2' of water (Anon 1981). (I would not put a name on that advice either). Spreads quickly and may form monocultures. Can increase established plants by division, but labor intensive.

Seed cold moist stratified for 180 days germinated in light at 30º to 32ºC. Inferred dormancy is physiological dormancy. (Baskin and Baskin 2003)
Description: Perennial emergent herb, 3.0-7.0'. 16" minimum root depth.
Comments: Blooms 5-9. Wetland restoration, useful in lower shoreline areas and vegetated swales for erosion control. Rhizomatous, aggressive, excellent shoreline erosion control. Provides food and cover for waterfowl. Seeds eaten by ducks, geese, rails, and shorebirds. Muskrats eat stems and roots. Spawning habitat for bluegill and bass. 56,049 to 87,000 seeds per pound. "Abundant in Pecatonica River sloughs north of Pecatonica, but not known elsewhere in the county. Also in Steephenson county in Peatonica River sloughs." (Fell 1955)

Scirpus maritimus Linnaeus *CT, IL, NJ, NY ALKALI BULRUSH, aka Bayonet Grass, Cosmopolitan Bulrush, Saltmarsh Bulrush, Seaside Bulrush (*maritimus*, maritime, of the sea)
Habitat: Fresh water marshes below 4000 feet. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement low. Salinity tolerance high. Shade intolerant. pH 4.0-7.0. distribution Throughout temperate North America, Asia, and New Zealand
Culture: Seed cold moist stratified for 80 days germinated at alternating temperatures of 30º/5ºC, with germination greater in light than dark (C. Baskin 2003i)

Seed from Presidio, Ca. needs no treatment (Young 2001f). Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.
Description/comments: roots rhizomatous culms 2-3.2.0'. Blooms 8-9. 160,000 seeds per pound.

Scirpus paludosus A. Nels. [*S. maritimus* var. *paludosus* (A. Nels.) Gl.] ALKALAI BULRUSH (*paludosus*, marsh-loving)
Habitat: Saline roadsides. Wet alkaline or saline soils in meadows, marshes, or near waterways. Best in moderately fine to fine soils. Basic to neutral soils.
Culture: Plant 8 lb pls per acre in fall or spring for pasture or reclamation (Granite).
Description: Cool-season, stout, tall, 2-5', rhizomatous, sod-forming, grasslike perennial. Blooms 5,6,7,8,9. Valuable for cover for waterfowl and shorebirds. Recommended for reclamation of mudflats, bogs, or other areas adjacent to shallow or stagnant water. Adventive in our area. 162,000 to 430,000 seeds per pound.

Scirpus pendulus Muhl. [old name *S. lineatus* Michaux] RED BULRUSH, BULRUSH (*pendulus*, pendulous, hanging)
Habitat: Wet meadows, mesic prairies, low woods and along streams. distribution
Culture: Fall plant or cold moist stratify-light.

Description/comments: 1.5-3.0'. Blooms 5-6. Wetland restoration, bunching. 5,973,684 to 6,725,925 seeds per pound. Good nesting cover, some populations may not manifest themselves in dry years. "Uncommon. Kishwaukee River bank at Shirley bridge below Cherry Valley and on drainige ditches in Otter Creek bottom in Laona Township." (Fell 1955 as *S. lineatus* Michx.)

Scirpus pungens Vahl CHAIRMAKER'S RUSH, aka Common Three square Bulrush, Olney Threesquare (*pungens*, piercing, sharp pointed)
Habitat: Marshes, stream borders, along shores, and in marshes. Wet meadows, marshes, and other low-lying sites. Moist shores, riverbanks, and mud flats. Best in medium fine to fine textured soils., saturated soil to 18" inundation. Tolerates seasonally flooded conditions. Nutrient load tolerance low. Siltation tolerance low to moderate. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance medium to high. Shade intolerant, full sun. Neutral or basic soils. Tolerant of alkalinity but does not require it. pH 6.7-8.9. or 3.7-7.5 (usda).
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Fall plant or cold moist stratify (90), light. Some say seeds need cold (34-36º F) wet stratification for 6-12 months followed by warm temperatures (75-80ºF). Fall seeding with natural stratification gives better results than spring seeding. Better germination with light and alternating temperatures. Seeded alone plant 8 lb pls per acre in fall or spring (Granite). In mixes plant 0.06 to 0.125 pls lbs per acre. Seeds, bare root and plugs available commercially. Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.

Plants suffer 50% mortality in > 20" H_2O. Bare root plants can have good survival planted spring to early summer. Plant rhizomes 2-5" deep on 2-6' centers. In favored locations, growth is rapid. Newly established plants are not flood tolerant. Water levels may need to be left down for some time. Sensitive to oxygen depletion.
Description: Cool-season, rhizomatous, grasslike perennial emergent herb. 3.0-5.0', up to 4', 14" minimum root depth. "Sessile spikelets, scales 2 cleft at apex to various degrees, bristles short. Stout rhizomes. Versus *S. subterminalis* and *S. torreyi*; versus *S. acutus* f. congestus - 1) absence of red-dotted viscid scales; 2) sharp triangular culms." (ilpin as *S. americanus*)
Comments: Blooms 5-9. Wetland and riparian restoration. Useful in lower shoreline zones, stream bank stabilization, and vegetated swales. Resists wave action and water level fluctuations. rhizomatous. 159,410 to 328,623 seeds per pound. "Very common on the banks of rivers, creeks, and sloughs." (Fell 1955 as *S. americanus* Pers.)
Associates: Important wildlife food. Provides food and cover for muskrats and waterfowl. Seed eaten by pintail, lesser scaup. Gadwall, canvasback, ringneck duck, rails, and shorebirds. Muskrats eat stems and rhizomes. Stems provide cover and habitat for ducks and small mammals, and spawning grounds for bluegill and bass.

For the variety *pungens*, "This taxon has traditionally had the name *Scirpus americanus* applied to it; this name, however, is properly applied to the traditional *Scirpus olneyi*. *Scirpus pungens* (or *Schoenoplectus pungens*) becomes the correct name for this plant (Schuyler 1974).

Scirpus rubrotinctus (*ruber*, red)
Fall plant on top of the ground or cold moist stratify for 60 days (Wade)

Scirpus validus Vahl **creber** [new name *Scirpus tabernaemontani* K. C. Gmelin] SOFT STEM BULRUSH, aka Bulrush, Great Bulrush (Medieval Latin *validus* strong, from Latin *valere* to be strong, strong, and *crebrus*, close, frequent, repeated) (*tabernaemontani* after Jabob Theodor von Bergzabern [*Tabernaemontanus*] 16th century physician and herbalist)
Habitat: Wet meadows, upland swamps, marshes, shallow water, brackish or fresh shallow water and marshes. Established colonies may be found in 12-20" water (maximum 48", minimum saturated soil to 6" water.) Nutrient load tolerance moderate. Siltation tolerance moderate. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement low. Salinity tolerance low to moderate. Shade intolerant, full sun. pH 5.4-7.5, or 6.5-8.5. distribution Throughout temperate North America south into tropical America.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Fall plant or cold moist stratify, light. Fall seeding more successful than spring seeding. Sow seed on wet mudflats in fall. Seeded area must be kept wet to covered with 1-2" water, followed by drawdown in mid to late spring. New seedlings are not tolerant of flooding.

Grabowski (2001a) had 30% germination after 4 weeks with two treatments; 1) cold moist stratification for 5 to 7 months, and 2) dry cold for 2-3 months followed by 3 to 4 months cold moist stratification. Seeds germinate best in saturated soils such as commercial ebb and flow greenhouse bench with greenhouse temperatures from 55º to 100ºF.

Seed cold moist stratified for 80 days germinated at alternating temperatures of 30º/5ºC, with germination greater in the light than dark (C. Baskin 2003j). Seed cold moist stratified for 180 days germinated at 30 to 32C, with germination greater in the light than dark (C. Baskin 2003k).

With Matanuska Valley seed, dried seed was hydrated and sown on Cornell wetland mix and exposed to winter temperatures, giving spotty, 25%, germination. Ross et al. (2004) are now experimenting with keeping seed moist until sown and surface sowing.

In mixes plant 0.06 to 0.25 pls lbs per acre (USDA 1997).

Seeds, bare root and potted plants are available. Bare root or potted materials are more reliable than seeding. Bare root materials may be planted in up to 6" of mud, but always try to plant things at the depth they had been growing previously. You will kill some species by planting them too deeply. USDA (1997) says plant in up to 12", but we recommend 4" maximum, and let them colonize into deeper water. 2-6' centers.

Drawdown is essential to establish seedings and helps promote vegetative establishment. Draw down in late spring and keep the water level down until fall. New plantings must be fenced to excludecarp, muskrats and Canada geese. Sensitive to oxygen depletion. Growth rate rapid. Seedling vigor low. Vegetative spread rate rapid.
Description/comments: Perennial, rhizomatous emergent herb, 3-10'. Blooms 5-8. Ethnobotanical uses. Pond landscaping, wetland restoration, very good for lower shoreline zone and used in vegetated swales. 496,000 to 622,344 seeds per pound. "Common on the banks of Rock and other rivers and Kent and on other creeks." (Fell 1955)
Associates: Seeds eaten by waterfowl, shorebirds, and rails. Plants are eaten by muskrats. Colonies provide nesting cover for waterfowl and habitat for insects and young fish.

Quidquid Latine dictum sit altum viditur.
Valeas, lacerta!

DIOSCOREACEAE R. Brown 1810

DIOSCOREA Linnaeus 1753 **Yam** *Dioscoreaceae* After Pedanios Dioscorides, 1st century Greek herbalist. Tender climbers.

Dioscorea villosa Linnaeus WILD YAM
"Woods, thickets, fence rows and railroads. Common." (Fell 1955) 60 days cold moist stratification (pm 09).

EUPHORBIACEAE A.L. de Jussieu 1789 **Spurge Family**

EUPHORBIA Linnaeus 1753 **Spurge** *Euphorbiaceae* New Latin, from the classical Latin *euphorbe,-a* euphorbia, from *Euphorbus*, 1st century Greek physician to Juba II, ob. 23, client-king of Mauretania and Numidia. (*Also seen as king of Numidia. Western Numidia and Mauretania Caesariensis are essentially the same place. The modern country of Mauritania is west and south of ancient Mauretania.*). Juba II was educated in Rome and married the daughter of Anthony and Cleopatra. Occasionally, *Euphorbia* is interpreted as being from Greek *eu*, well, and *phorbê*, pasture, food, although some species produce a blistering sap. Euphorbus is also the name of a Trojan hero of the Trojan War. A very large and wide spread genus of greatly diverse appearing plants, some being fleshy succulents, others like cacti, others leafy and herbaceous, or sub-shrubs, or tender shrubs, but all having milky juice and flowers without a calyx and included in an involucre which surrounds a group of several staminate flowers and a central pistillate flower with 3-lobed pistils. Annual and perennial species.

Seeds mature in late summer, about 3-4 weeks after flowering. Ripe seeds are quickly shed. Germination is easy by cold moist stratification. The seedlings have fragile taproots that are easily damaged while transplanting. Code B. 4-6" tip cuttings with 2,000-ppm liquid dip yield about 50% rooted in 4-6 weeks. (Cullina 2000)

Euphorbia corollata Linnaeus FLOWERING SPURGE, aka Apple Root, Milk Ipecac, Purging Root, Snake Milk, White Purslane, Wild Hippo. Common name from Latin *expurgare,* to purge.
Habitat: Mesic, dry, hill, and sand prairies, savannas and open woods. Dry to moist prairies and open woods, dry open woods, fields and roadsides, common plant in prairies, glades, and open glades. "A common weed of roadsides and pastures." (Fell 1955)
Culture: "Moist cold treatment, or fall sow. Light cover. Fair to good germination." (Dunham 1993) 30 days cold moist stratification (pm 09). Seeds germinate after about 60 days of cold moist stratification (Heon et al. 1999). Moist cold stratify or fall plant. Division-stem and root cuttings, best from moist stratified seed monoecious. Moist cold stratification, easily divided and transplanted, root cuttings (2-3" section of upper root containing a bud), but roots are brittle and difficult to produce uniform transplants, can use 2" root cutting treated with Rootone planted 2" deep.
Description: Warm season, two to three feet tall. Alternate linear leaves, nearly sessile, hairless, whorled below the flower cluster, leaves turning dark red in fall. Lower leaves are shriveled or shed at time of flowering. Umbellate (flat topped to paniculate cyme) clusters of 5 tiny white flower-like bracts from June to mid September. True flowers in center of bracts. The poinsettia is a close relative with red bracts surrounding the true flowers. Fruit is broad capsule that explodes when ripe.

Comments: Blooms 5-9. Euphorbia is a member of a family of latex, or milky sap producing plants. The latex sap is acrid and can cause blisters on sensitive skin. Inconspicuous white flowers with long lasting white bracts, pollinated by short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, and Hemiptera. Ethnobotanical uses, landscaping, aggressive, allergenic sap. 128,000 to 160,000 seeds per pound.
Associates: Pollinated by short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, and Hemiptera. Spurge has been used as a laxative, but overdose is poisonous. Poisonous to livestock. Attractive delicate cut flower, when used as filler, very similar to Baby's Breath. The latex sap may not mix well with some cut flowers.

FUMARIACEAE Augustin de Candolle 1821 **Fumitory Family** A family of about 15-20 genera and 500-600 species of herbs, primarily north temperate.

DICENTRA Bernhardi 1833 **Bleeding Heart** *Fumariaceae* From Greek *di,* two and *kentron*, a spur, for the flower has two spurs. A genus of about 12 species of perennial herbs with a relictual north temperate distribution: eastern North America, western North America, and eastern Asia.

Dicentra seeds are hydrophilic, ant-harvested, and mature late spring to early summer. As soon as seeds are black, harvest green pods and sow seeds immediately in cold frame. Code D*. (Cullina 2000) Remove and replant bulblets while dormant during summer.

Dicentra cucullaria (Linnaeus) Bernhardi DUTCHMAN'S BREECHES (hood-like, for the flowers.) "Common in woods." (Fell 1955)
Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm 09).

GENTIANACEAE A.L. de Jussieu 1789 **Gentian Family** A family of about 87 genera and over 1600 species of herbs, shrubs, and trees, cosmopolitan.

FRASERA Walter **Green Gentian** *Gentianaceae Frasera* after John Fraser, 1750-1811, a Scottish collector of North American plants.

Frasera caroliniensis Walter AMERICAN COLUMBO, aka Green Gentian
Best planted outdoors in the fall (pm 09).

GENTIANA Linnaeus 1753 **Gentians** *Gentianaceae* New Latin, from Latin *Gentiana* after King Gentius of Illyria, 2nd century BC, who discovered medicinal properties of *G. lutea*, the European yellow gentian. A genus of about 350-400 species annual, biennial, or perennial herbs, primarily temperate and arctic, that have smooth opposite leaves and showy solitary or cymose, erect, vase-like flowers with 4-lobed or 5-lobed corolla, flowering late summer and fall. Some species contain a bitter glycoside often used as a tonic.

G. andrewsii and *G. flavida.* "Cold moist treatment or fall sow. Very light cover. Grit works well. Good germination. Potted plants benefit from light shade. (Dunham 1993).

Seeds mature in fall. Capsules may be infested with weevils (?) that eat much of the seed. Surface sow and lightly cover with sand for outdoor treatment. Seedlings are slow growing, feeding helps. Code B, H. (Cullina 2000)

Fruit is capsule with tiny seeds. Some species have "balloon-like" flowers

Gentiana andrewsii Grisebach BOTTLE GENTIAN, aka Closed Gentian (after H.C. *Andrews*, early 19th century botanical writer)
Habitat: Wet meadows, mesic to wet prairies, mesic savannas.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Fall plant or cold moist stratify, light, easy from moist-stratified seed, successional restoration, division with care.
Description/comments: Unusual blue flowers pollinated by bumble bees, Coleoptera, 1.0-2.5'. Blooms 8-10. Cut flowers, attractive dried seed heads, landscaping, calcareous. Retesting of individual lots show viability declines significantly in storage, from 93% to 6% in 10 months. 4,480,000 to 11,493,670 seeds per pound. "Relatively common and generally distributed in wet places; low prairies in Grove Creek bottom, swampy places on Killbuck Creek, Searle Tract, C. & N.W. Ry. east of Winnebago, and boggy places in Coon Creek bottom." (Fell 1955)

Gentiana crinita Froel. FRINGED GENTIAN (long haired, from Latin *crinitus*, with long hair, hairy.)
Habitat: Wetland, wet prairies. Moist meadows, woods, and streambanks. Said to tolerate clay soils.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Fresh seed, do not dry store seed! Cold moist stratify, light or GA3.

Description/comments: Blue flowers, blue as "the male bluebirds back" (Thoreau) 1.0-1.5' Blooms 8-11. Biennial. 2,387,360 to 3,200,000 seeds per pound. "This is uncommon and it is irregular in distribution from year to year in the boggy places in Coon Creek bottom and the Searle Tract. Also in Kishwaukee River bottom near Cherry Valley and in a bog near Irene, in Boone County." (Fell 1955)

Gentiana flavida Gray *IN-Mi -WI YELLOWISH GENTIAN, aka Cream Gentian, Pale Gentian, White Gentian (Yellowish, from Latin *flavus*, adjective, golden yellow, reddish yellow, flaxen, blonde, and *idus*, adjective suffix, condition or progression.) facu
Habitat: Mesic and dry prairies, dry savanna, wooded slopes clay soils; damp woods, prairies, and meadows
Culture: Fall plant or cold moist stratify-light. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description/comments: Cream flowers 1.5-3.0'. Blooms 8-10. Cut flowers, dried seed heads, ethnobotanical uses landscaping. Tolerates mildly acidic soils. 2,240,000 to 6,532,374 seeds per pound.

"Uncommon, being usually in woods, often dry sandy ones; edge of woods in Rock Cut, sandy oak woods west and north of Shirland. Also in a dry brushy place on Cunningham road west of Rockford. It is the first gentian to bloom. When in flower it has a peculiar way of spreading out flat on the ground with the heads turned up." (Fell 1955)

Gentiana procera Holm SMALL FRINGED GENTIAN (tall, high, long, tall and slender like a tree, from Latin *procerus*, adjective, tall, large.)
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) 11,568,000 seeds per pound.

"Uncommon. Coon Creek in Winnebago County, a bog east of Irene in Boone County and in a similar situation in Kishwaukee River bottom in DeKalb County. There is some question whether most of our plants are not of this species rather than the preceding. (*G. crinita*) The only places that we have seen large, much branched plants with broadly ovate leaves and with long fringe on the free edge of the petals is in Coon Creek bottom and the Searle Tract. All others in our neighborhood are suggestive of G. procera in the size of the plant, the shape of the leaves, and the fringing of the petals." (Fell 1955)

Gentiana puberulenta J. Pringle *MI PRAIRIE GENTIAN, aka Downy Gentian
Habitat: Mesic, dry, and sand prairies
Culture: Fresh seed-fall plant or cold moist stratify-light-division-cool soils-temperature sensitive. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) (Code C, D, needs companions Ken Schaal)
Description/comments: Blue flowers pollinated by bumble bees. 0.5-1.0'. Blooms 8-10. 4,536,000 to 6,960,000 seeds per pound. "Locally common on dry prairies; C.& N.W. RY. east and west of Rockford, the Searle Tract, the gravel hills and bluffs that border Rock River. Even more than other gentians this is subject to attack of its seed capsules by insects." (Fell 1955)

Gentiana quinquefolia Linnaeus STIFF GENTIAN
Habitat: Dry calcareous hill and gravel prairies, dry calcareous slopes, calcareous woodlands in rocky, shallow soils over dolomite; mesic and dry mesic prairies and savannas
Culture: Sow seed as soon as ripe or cold moist stratify as soon as ripe. Very small seed, needs light to germinate. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description/comments: Biennial or annual, 1.5-2.5'. 2,880,000 seeds per pound. "Quite uncommon, on dry gravel bluffs, limestone outcrops and high prairies." (Fell 1955)

GERANIACEAE A. L. de Jussieu **Geranium Family** 11 genera and about 700 species of herbs and shrubs, mostly temperate.

GERANIUM Linnaeus 1753 **Geranium, Cranesbill** *Geraniaceae* From the Greek name *geranion* from *geranos* a crane, for the beak like fruits. Perennial herbs. The domestic geranium is a *Pelargonium* (from the Greek *pelargos*, a stork, also referring to the storks bill-like fruit). A genus of about 300-430 species of herbs, mostly temperate.

Seeds are hydrophilic, mature in early summer, and are explosively expelled. Seeds should be planted immediately in a cold frame or stored in a plastic bag until fall. Seedlings should be encouraged to grow all summer by good container culture, consistent moisture and regular feeding, keeping containers from becoming warm and dry. Code B* (Cullina 2000)

The western *G. caespitosum* sow seed in fall or for spring sowing, scarify seed and soak 6-8 hours in water or hydrogen peroxide, then cold stratify 1-4 months (pots 2000). Some seed technicians feel *G. maculatum* has 'hard' seeds, scarification may help.

Geranium maculatum Linnaeus WILD GERANIUM, aka Spotted Cranesbill
Habitat: Mesic savanna and woodland. "Common in woods, thickets, and meadows." (Fell 1955)

Culture: "Sow seed upon ripening and overwinter flats, or fall sow. If not possible try cold moist treatment. Scarification of ...? variable germination." (Dunham 1993) 90 days cold moist stratification. Best planted outdoors in the fall. (pm 09) Fresh seed or cold moist stratify, cool soils. Geranium has hard seed coats, needing scarification.
Description/comments: Pink flowers 1.0-1.5', Blooms 4-7. Seeds mature early summer. Ethnobotanical uses. 80,000 to 89,396 seeds per pound.

GRAMINEAE A.L. de Jussieu 1789 or *Poaceae* (R. Brown) Barnhart 1895 Grass family

If it's flat and smooth,
it's little bluestem

If it's flat and fuzzy,
it's big bluestem

If it's round and smooth,
it's switchgrass

If it's round and fuzzy,
it's Indian grass

Ray Schulenberg

Annual or perennial herbs, or woody shrubs and trees in some bamboos. Approximately 670 genera and 10,000 species, cosmopolitan. Plants with cylindrical, jointed, and often hollow stems, and 2-ranked leaves, each with a sheath, ligule, and blade. Individual flowers inconspicuous, with 2-6 stamens, 1 pistil, and 1-3 small scalelike tepals, or lodiclues, with each flower enclosed by bracts (lemma and palea), the whole called a floret. Single or several florets are attached to an axis subtended by 2 nonfertile bracts or glumes; each floret produces a 1-seeded, achenial fruit, a grain or caryopsis, occasionally achenes in some genera, the seed being encased in a ripened ovary. Largely wind pollinated. Some Bamboos produce fleshy fruits.

Primitive grasses may have evolved 89 million years before the present (mybp) (some suggest 100-110 mybp), with conventional grasses known from the Paleocene-Eocene boundary, 55 mybp. Grasslike opal phytolyths are known from dinosaur coprolites from the Late Cretaceous (71-65 mybp) in India. Grasses were in adequate abundance to fuel the grazing mammal radiation of the Miocene. C4 photosynthesis originated in the mid-Miocene (16-12.5 mybp). C4 grasses may be less palatable than C3 grasses, with lower nitrogen content and more sclerenchyma (Caswell et al 1973).

Worldwide family of over 10,000 species, occuring over a wide range of moisture regimes. Climax vegetation in seasonally drier regions of the world. Grasses provide many important food, fiber, forage and technological plants.

Grasses provide valuable wildlife cover and nesting habitat for elk, deer, muskrats, game birds, songbirds, ducks, waterfowl, marsh birds, shorebirds, (rails, herons, marsh wren), small mammals, fish, reptiles, amphibians, and insects. Beetles eat pollen and roots. Grasses are larval hosts for many butterflies, including the browns, Satyrinae, and the related Morphinae. Rusts are common on grasses, and approximately 600 species of smuts (*Ustilaginales*) are known to occur on grasses. Endophytic fungi are widely distributed among grasses, which influence the palatability of the foliage and seeds, the level of insect infestations, and the rate of vegetation decay. Endophytic fungi produce a number of alkaloids, including ergot alkaloids.

"Grass noun. Probably from about 1150 *gras*, found in Old English *graes, gaers,* herb, plant grass (about 725, in *Genesis A:* earlier in the compound *graesgroeni* (grass green); cognate with the Old Frisian *gres* grass, old Saxon and modern Dutch *gras*, Old High German *gras* (modern German *Gras*), Old Icelandic *gras* herb, grass and Gothic *gras* herb from Proto Germanic **grasan*, from Indo-European **ghra-s.* root *grho*.

AGROPYRON Gaertner 1770 From Greek αγριος, *agrios*, wild and πυρος, *pyros,* wheat. A widely distributed genus of chiefly perennial grasses with erect spikes of usually solitary several-flowered sessile spikelets. The synonyms of our local wheat grasses are too complex to list in detail here, but are very interesting to those who have been toilet trained at gunpoint. About 35 species, widely distributed in temperate climates. Some species are often infected with ergot. Also spelled *Agropyrum*. Aka *Elytrigia*: Greek *elytron*, sheath, covering.

Linnaeus originally placed all wheatgrasses in *Triticum*, the wheat genus. Look fast folks, cause the name *Agropyron* may vanish before your eyes. *Agropyron* is now reserved for the inroduced crested wheatgrass complex.

Agropyron repens (L.) P. Beauv. #AK, AZ, CA, CO, HI, IA, KS, OR, UT, WY [New nomenclature this will be *Elymus repens* (L.) Gould.] QUACKGRASS, aka Common Couch, Couchgrass, Couch Grass, Creeping Quackgrass, Dog Grass, Quitch, Quitch Grass, Quick Grass, Scutch, Scutch Grass, Twitch, Twitch Grass, Witchgrass. (*repens*

creeping, from Latin, *repens*, participle of *repo*, to crawl, or creep; having creeping and rooting stems.)
Habitat: Weed of fields, roadsides, and railways. Adapted to coarse, medium and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. High fire tolerance. Salinity tolerance none. Shade intolerant. pH 5.2-7.8. distribution Species is common in northern 3/4, rare in southern 1/4 of state for forma *repens*. Forma *aristatum* is rare, only found in Cook co.
Culture: Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid. Moderate seed spread rate.
Description: general form Rhizomatous introduced perennial roots long, running rootstocks, with numerous shoots forming a loose but tough sod, 14" minimum root depth leave rolled in the bud-shoot sheaths not compressed, not keeled, pubescent with soft, short, erect or retrorse hairs especially on lower leaves, rarely glabrous, green, split, with hyaline margins overlapping auricles present, 1 to 3 mm long, slender, terete, clawlike, clasping; collar distinct, puberulent both inside and outside, whitish, yellowish or sometimes purplish tinged, broad, V-shaped, divided by midrib, oblique. ligule membranous, 0.5 to 1.0 mm long, obtuse, finely tooth-fringed, ciliolate or entire; blade 3 to 10 mm wide, 8 to 20 mm long, flat, slightly keeled at base, sharp-pointed, green sometimes slightly glaucous; upper surface generally sparsely pilose-pubescent, slightly ridged but midrib not conspicuous; margins and upper surface harsh-scabrous key features "This grass is extremely variable in the degree of hairiness of the blades and sheaths. The hairs are more noticeable on the young leaves in the spring than on those formed later in the season. *Agropyron repens* may be distinguished from *A. cristatum* by its puberulent collar and less conspicuously ridged blade." (Nowosad etal 1936) "Like *Agropyron smithii*, but has pubescent sheaths and flat broader leaf blades. Forma *aristatum* with awns to 10 mm long versus *A. smithii*; leaves are deep green or blue-green, felxible, soft, flat leaves." (ilpin)
Comments: Noxious weed in Alaska, Arizona, California, Colorado, Hawaii, Iowa, Kansas, Utah, and Wyoming. "B" designated weed in Oregon. This species is considered weedy and invasive in parts of its range. The creeping rhizomes are difficult to eradicate Blooms June-July. C3. Allelopathic (usda). 110,000 seeds per pound. Larval host of *Thymelicus lineola*, European Skipper (Skipperling).

"Our common quackgrass has very short awns. The long awned variety appears more often in highway shoulder and railroad bank plantings." (Fell 1955)

Agropyron riparium Scribn. & J.G. Sm. [New nomenclature *Elymus lanceolatus* (Scribn. & J.G. Sm.) Gould ssp. *lanceolatus*.] STREAMBANK WHEATGRASS, aka Thickspike Wheatgrass. (*riparius -a -um* of river banks, from Latin *riparius*, frequenting banks of streams or rivers, riverside.)
Habitat: Definitely not Midwest native but occasionally specked in Illinois jobs. Adapted to coarse to fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement medium. Salinity tolerance low or medium or high. Shade intolerant. pH 6.6-8.4. Characteristics may vary with the cultivar. Common in the northern Great Plains and Intermountain regions.
Culture: Plant in fall or spring, 6-8 lbs per acre in fall (Rainier). 6-8 pls lbs (20-25 pls seeds per sq ft) in early srping on heavy to medium textured soils and in late fall on medium to light textured soils (USDA). For turf plant 2 pls lbs per 1,000 ft. sq. For reclamation, plant 15 pls lbs per acre (pots 2000). Growth rate moderate. Seedling vigor high to excellent. Vegetative spread rate rapid.
Description: Cool-season, more drought-tolerant, than its name would lead you to believe, strongly rhizomatous, sod-former, spreading strongly underground, short to medium tall, to 1'-3',perennial sod-former, with thin leaves making a soft texture. Forms an extensive rhizome system.
Comments: Makes fine textured lawn if mowed, responds to irrigation. Excellent erosion control. Good wildlife value, medium to desirable forage value for cattle, sheep, horses, and elk. This grass is also eaten by deer and antelope in the spring. Several commercial varieties available, with seed counts ranging from 66,000 to 153,000 seeds per pound.

This species has been specified in erosion control projects in northern Illinois. Its use should be limited in Illinois, until its aggressive potential is known. According to the USDA plant guide (http://plants.usda.gov), this plant grows near sea level in the Great Lakes region, which by my calculation puts it near the deepest parts of Lake Michigan. *Elytrigia dasystachya* (Hook.) A. Löve & D. Löve subsp. *psammophila* (J.M.Gillett & Senn) Dewey GREAT LAKES WHEATGRASS grows on the shores of Lake Michigan in Wisconsin and Michigan (threatened in Wisconsin).

Agropyron smithii Rydb. [New nomenclature *Pascopyrum smithii* (Rydb.) A. Löve] WESTERN WHEAT GRASS, aka Bluejoint, Bluestem, Colorado Bluestem, Smith Bluejoint, Western Quackgrass (*Pascopyrum* from Latin *pascuum,* pasture, and Greek *pyros*, wheat) (after Jared Gage Smith, 1866-1925)
Habitat: Railroads and waste places, and dry prairies? It does not do well on coarse soils, best in neutral to basic soils. Where native it grows best in bottomland soils, but will grow on heavy upland soils. Medium acidity tolerance, medium salinity tolerance. distribution Occasional in northern 2/3, rare in southern 1/3 of Illinois. Introduced from western North America.

Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment, seeds are non dormant (Baskin & Baskin 2001). Seed 10 pls lbs per acre, plant in fall or spring (Granite). Broadcast 1 pls lb per 1,800 sq. ft. or drill 12-15 pls lbs per acre. 10 lb per acre in fall or spring (Ranier)
Description: Cool-season, saline-tolerant, moderately drought-tolerant, strongly rhizomatous, sod-former, medium tall,13-24 tall. Plants are glaucous, stems bluish green, leaf blades have rough, raised, harsh, veins on upper surface. 2n = 56. key features: "This taxon has lemmas glabrous, scabrous, or pubescent near the base; leaves and culms have a silver-blue cast, and leaves have unique involute margins." (ilpin)
Comments: Blooms 6,7. C3. AGGRESSIVE AS HELL. Potentially a serious weed in Illinois, but a good pasture grass in the Great Plains where it is native. Drought resistant and winter hardy. Poor erosion control. Good wildlife value. Moderate forage value. Moderately palatable to livestock and wildlife. Used in range seedings and grass waterways, most often in mixtures. Good for xeriscaping. Allelopathic, native further west, adventive our area. Var. *molle* (Scribn. & J. G. Smith) Jones is known in northern Illinois (Floyd and Gerry 1994). 110,000 to 117,500 seeds per pound. Several commercial varieties available. Known to hybridize with its very close relative, the dreaded Quackgrass *A. repens*. My friend and mentor, Jock Ingles pointed out the problems of using this plant in Illinois restorations, while showing me some business campus plantings along the Illinois River, dominated by this grass. In the early- to mid-1980's, some people experimented with Western Wheatgrass as a seed mix component in the high rainfall Tall Grass Prairie, because it is native, cool season, and short, and cheap! Just what everyone did want and still wants in a native grass. It is too aggressive in Illinois except in landfill or mine reclamation work.

"Doubtfully native. Much used for erosion prevention on cuts and fills. Its color is noticably bluer than the above (*A. repens*)." (Fell 1955)
Associates: Endomycorrhizal.

Agropyron trachycaulum (Link) Malte ex H.F. Lewis [or just (Link) Malte] *MA, NJ, OH [New nomenclature this will be *Elymus trachycaulus* (Link) Gould ex Shinners] SLENDER WHEAT GRASS, aka Dog Couch Grass, Rough-stemmed Wheatgrass, Bearded Wheatgrass, Western Rye-Grass. (Greek *trachy*, rough, or *trachelos*, neck, and Latin *caulis*, stem)
Habitat: Mesic prairies, waste grounds, railroad tracks, degraded, calcareous prairies, occasional in sandy soils, 2,000-4,500'. Adapted to medium and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement medium. Salinity tolerance medium or high. Shade intolerant. pH 5.6-9.0. Native to northern and northeastern Illinois.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment, drill no deeper than 0.75" deep, 5 to 7 lbs (6-8 Granite) pls per acre, but never plant alone, easily and quickly established. Plant in late fall or early spring. Plant 6-8 lb/ac in fall (Rainier 2002). In midwestern seed mixes do not excede 1-2 pls lbs per acre, or the permanent matrix will be stunted. Growth rate rapid. Seedling vigor high. Vegetative spread rate none. Slow seed spread rate.
Description: general form Cool season, short-lived (3 to 5, rarely 5-10 years) perennial bunchgrass roots very short rhizomes culms moderately tall 13-24" leaves rolled in the bud-shoot sheaths not compressed, glabrous, light green, split; margins hyaline auricles rudimentary or absent. collar distinct, glabrous, pale green, continuous, often oblique ligule membranous, 0.5 to 1.0 mm long, truncate, finely ciliate blade 3 to 6 mm wide, 5 to 25 mm long, flat, narrow at base, tapering to a sharp point, medium green, glaucous, scabrous and distinctly ridged on upper surface, keeled on under side; margins scabrous key features *Agropyron pauciflorum* (*trachycaulum)* is distinguished from *Agrostis tenuis* by its broader blades, rudimentary auricles and its tufted habit.
Comments: Blooms 7-8. C3. Cool season, bunch grass, moderately drought tolerant. Calcareous soils, saline tolerant. Good for quick, native perennial non-aggressive cover. It is a good native nurse crop, persisting long enough for slower developing species to establish. Very good erosion control. Good forage values. Good palatability to livestock and wildlife. Best wildlife values. Used for food and cover by upland game birds and small mammals. Beware of large grazing ungulates. Good xeriscaping. 110,400 to 171,030 seeds per pound. Several commercial sources and varieties of subspecies *trachycaulus* are available. Some characteristics may vary with the cultivar. "Prairie east of Winnebago, apparently native." (Fell 1955, as *A. pauciflorum* (Schw.) Hitch.)
Associates: Endomycorrhizal.

AGROSTIS Linnaeus 1753 **Bentgrass, Cloud-grass, Spear-grass** *Agrostis* field-grass, from Old Greek αγρος, *agros*, a field, or Greek *Agrostis*, grass, from *agrosteis*, grass, αγρωστις, *agrostis,* field grass eaten by mules, variously ascribed to *Triticum repens* and *Cynodon dactylon.* Αγρωστις was a name used by Theophrastus for an αγριος, *agrios*, wild, grass.
About 100 species throughout the temperate and cool regions (35 in USA) having an open or contracted panicle with small one-flowered spikelets. Typically moisture loving plants. Mostly perennials, but three annual species occur in the United States.

Agrostis alba L. RED TOP GRASS Common name from its usually reddish pyramidal panicles, which may occasionally be white. (*albus -a -um* from Latin *albus*, white, particularly a dull rather than a glossy white, or, dead white; pale; a general white.)
Habitat: Apparently some possible native populations in fens, but widespread in degraded prairies and wetlands, with most populations introduced from Europe. Coastal marshes, roadsides. 0-4,500'. Formerly planted as a pasture grass, now a "temporary matrix" grass. Wet, poorly drained soils. Will tolerate frequent flooding. Adapted to coarse, medium, and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance none. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none, or low or moderate. Shade intolerant. pH 4.5-7.5 or 8.0.
distribution Native to the northern parts of the Old and New Worlds, but introduced over much of the United States.
Culture: No treatment needed. Needs light. Seed 1 lb pls per acre (Granite). Seed in fall or spring. Drill 3 - 4 lb pls per acre (Stocks). .75 to 1 per 1000 ftsq new seeding (for turf). 8-10 lbs per acre (USDA1937). Seed 1 lb per acre in fall or spring (Rainier 2002). In mixes use a maximum of 1-2 lbs per acre in mixtures. For pure stands use 4-5 lbs per acre. Higher rates may be used in critical erosion areas, but redtop grows rapidly after seeding and heavy rates are not advised. Growth rate rapid. Seedling vigor high. Vegetative spread rate rapid. Moderate rate of spread from seed.
Description: Dark green, glabrous perennial, cool season, with erect or geniculate culms, fine stems, reddish to white seed head roots rhizomatous, open to thick sod, fibrous root system, from long, vigorous, creeping rootstocks, minimum root depth 20" leaves narrow, rolled in the bud-shoot sheaths not compressed, not keeled, glabrous, smooth, green, longer than the internode on the basal shoots, split with margins overlapping auricles absent, collar prominent, glabrous, pale green, V-shaped, usually oblique ligule membranous, thin, 1.5 to 4.0 mm long, rounded to acute, lacerate, erose, or split, minutely retrorse hairy on back blade 2 to 7 mm wide, 5 to 20 mm long, flat, tapering to a sharp point, prominently ridged on upper surface; midrib distinct below; surfaces scabrous or smooth; margins scabrous key features "This is a matted perennial with purple spreading panicle. It differs from var. *palustris* by broader blades, erect culm with spreading purple panicle branches, and presence of rhizomes. Foliage is bluish-green." (ilpin) "*A. alba* is distinguished from *Phleum pratense* by the glabrous margins of collar, the absence of a notch at either side of ligule and by the prominently ridged upper surface of blade. It is distinguished from *A. palustris* by the absence of long surface stolons and non-creeping habit. It has a longer ligule and broader blades in qcomparison to *A. tenuis* and *A. hiemalis,* respectively." (Nowosad etal 1936)
Comments: Blooms 6-7. C3. Aggressive, cool-season, sod-forming weed. Establishes quickly for erosion control, excellent erosion control. Establishes quickly in moist soil. Adapted to moist or moderately wet sites. Tolerates acidic soils, infertile soils, and periodic flooding. It is used as a crop on poor soils and worn out ag lands. Used for pasture and turf grass. Said to not be aggressive in mixes. (?) One of our most widely adapted grasses. 4,850,000 to 5,469,000 seeds per pound.

"We have considered this and the next (*A. palustris*) as being native. This is common red-top and is found in fields, yards and on roadsides." (Fell 1955)

Associates: Palatable and nutritious to livestock and wildlife, but not as palatable as timothy and Kentucky Bluegrass. Better when hayed or grazed before seed heads form. Overall poor wildlife and forage values (Rainier 2002).

Redtop pollen is known to cause seasonal allergic reactions in certain individuals. "This species and *Phleum pratense*, in June and July, cause most of the hayfever cases in the eastern United States." (ilpin)

When Linnaeus described *A. alba*, he was describing a species of *Poa*, hence the *A. alba* in the literature is not the *A. alba* of Linnaeus. A more current, commonly used name is *Agrostis gigantea* Roth. There is also considerable confusion between redtop and creeping bent, with somewhat circular definations. Redtop is often considered a nonstoloniferous, mostly rhizomatous, variety of creeping bentgrass, and creeping bentgrass is considered a stoloniferous variety of redtop, with references to *A.alba* or *A. stolonifera* not distinguishing between the species.

Agrostis alba Linnaues var. **palustris** (Huds.) Pers. CREEPING BENT GRASS, Carpet Bentgrass, Spreading Bent Grass, (*palustris -is -e* marsh-living, of swamps, of marshes, or growing in bogs, marsh loving, from Latin *paluster -tris -tre* marshy, boggy)
Habitat: Widely planted for turf, but native in alkaline fens and along quality streams, occasionally in drainage ditches. Wet meadows, marshes, fields and roadsides. Grows well in moist sites. Medium to moderately fine textured soils. Acidic to neutral soils (Granite). 0 – 4,500'. Low drought tolerance, high acidity tolerance, low to moderate salinity tolerance. pH 5.0 – 7.5 (pH 6.0 – 7.0 preferred for lawns).
Culture: No treatment necessary. Can be drilled 1/4" or broadcast and cultipacked, 2 to 3 pls lbs / 1000 ft. sq., or 0.5-1.0 lb per 1000 ft sq. for turf. Plant when moisture is favorable, early spring, June to July, or late fall. Plant 2 pls lbs fall, spring or summer for pasture (Granite). Medium rate of establishment. Seed 2 – 3 lb/acre in fall or spring (Rainier 2002).
Description: Cool season, prostrate and low-growing, medium to tall grass, 13-24+", glabrous, stoloniferous perennial, sod former, sometimes with short rhizomes; long creeping stolons spreading along the surface of the ground, branching and rooting at the nodes, culm leaves flat and wide leaves rolled in the bud-shoot sheaths not compressed, not keeled, glabrous, smooth, pale green or purplish, shorter than or equaling the internode in length on the vegetative shoots, split with hyaline margins auricles absent. collar distinct, glabrous, pale green, usually oblique ligule membranous, thin,

1.5 to 3 mm long, rounded or obtuse, finely lacerate-toothed or entire, minutely hairy on the back blade 1.5 to 4 mm wide, 3 to 10 mm long, erect, flat, tapering, distinctly ridged on upper surface, slightly keeled on lower surface, scabrous on the surfaces and margins key features "Creeping bent-grass and red top are often considered as varieties of *A. stolonifera* being very similar to red-top in leaves and ligule and differing from it in habit of growth, the former producing long surface stolons and the latter rootstocks." (Nowosad etal 1936)
Comments: Cool season sod former, forming mats of foliage in moist situations. Calcareous, some varieties saline/alkaline tolerant, some tolerate acidic conditions. Good for erosion control and reclamation sites. This is the grass used on golf course putting greens. It escapes from the greens and does well in the water level fluctuation zone of golf course wetlands. Its long creeping stolons may reach 4 feet in one growing season. Used for lawns, pastures, meadows, and irrigated areas. Poor wildlife and forage values. 4,990,000 to 7,800,000 seeds per pound.

"Common in Killbuck Creek bottom in Winnebago and Ogle counties; less common along other Winnebago County streams." (Fell 1955)

According to a US EPA study in the Proceedings of the National Academy of Science, pollen from genetically modified Roundup resistant bentgrass, released by the good folks at Scotts and Monsanto, has been shown to travel 13 miles. Scotts thought the pollen would move 1000 feet. Sure. Some fear the transfer of resistant genes to feral and wild *Agrostis* populations creating another Roundup resistant super weed. Bye bye local ecotype bent populations, hello Superbent.

Agrostis hyemalis (Walter) B.S.P. HAIRGRASS, aka Fly-away Grass, Tickle Grass, Winter Redtop Specific epithet may be spelled *hiemalis* in older literature. (Latin *hyemalis*, of winter, from *hiemalis,* of winter, wintery)
Habitat: Dry, sandy soils, slightly acid, sandy soil; sterile, sandy acid, abandoned fields, old meadows and pastures where the competition is slight. "A common early grass of fields, farm lots, yards and roadsides." (Fell 1955) In the northern plains, wet meadows, seepage areas, ditches, stream banks, shores and also in upland situations, often where alkaline. In northwest Illinois, this is an occasional weed of fallow ground and an agricultural wetland soil sedbank species.
Culture: 60 days cold moist stratification (pm 09).
Description: general form A small tufted grass with slender, fine, soft, leaves, from a basal rosetts, an open ground species leaves rolled in the bud-shoot sheaths not compressed, slightly keeled, glabrous, smooth, pale green to white or purplish, split auricles absent collar narrow, inconspicuous, pale green ligule membranous, 1 to 2.5 mm long, truncate or three-pointed, entire or finely lacerate, hairy on the back blade 0.5 to 2 mm wide, 2 to 8 mm long, soft, very sharp taper-pointed, often inrolled or involute and hair-like when dry, glabrous, distinctly ridged and scabrous on upper surface, smooth and distinctly keeled on under surface; margins scabrous.
Comments: Blooms 5-7. Readily grazed, but one of the least palatable redtops. According to Swink & Wilhelm (1994), it frequently grows with *A. scabra* with specimens being intermediate. 1,360,000 to 9,669,674 seeds per pound.

Agrostis perennans (Walter) Tuckerman * PA UPLAND BENT GRASS aka Autumn Bentgrass, Thin Grass, Tall Bentgrass, Perennial Bentgrass (Latin *perennans*, perennating, perennial, from *perenno*, to last many years.)
Habitat: In woods with no leaf or vegetative cover, moister acidic woods, floodplain woods with little vegetative cover (potcr94). Dry open ground or in light shade (ecs). Woods, thickets, open areas, stream banks. Open woods, thickets, rocky banks and dryish open soil. Adapted to fine and medium textured soils. Anaerobic tolerance high. CaCO3 tolerance none. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.5 – 7.5.
Culture: Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate.
Description: general form perennial to 1 to 3.5', decumbent, mostly tufted roots rhizomatous, 8" minimum root depth spikes panicle key features This *Agrostis* is distinguished by its smooth panicle branches and its usually green panicle branches with 5-9 whorls of branches.
Comments: Blooms 8-10. C3. May be short lived. 8,000,000 per pound.

Agrostis scabra Willd. FLY-AWAY GRASS, aka Rough Bentgrass, Tickle Grass (*scaber, scabra* scabrous, rough or gritty to the touch on account of numerous minute projections, from Latin *scaber*, scabby, rough.)
Habitat: In habitats similar to *A. hyemalis,* rocky moranic hills (Swink & Wilhelm 1994). Fine to medium textured soil. Low drought tolerance. Low salt tolerance. pH 6.0 – 8.0
Description/comments: Bunchgrass to 3', 12" minimum root depth. Blooms 6-11. Used for reclamation. 5,000,000 to 5,400,000 seeds per pound. "Later than the above (*A. hyemalis*) but otherwise it is much the same and probably as frequent." (Fell 1955)

Agrostis tenuis Sibthorp COLONIAL BENTGRASS, aka Browntop, Highland Colonial Bent, Rhode Island Bent (*tenuis -is -e, tenue* slender, thin, fine from Latin *tenuis, tenu-,* fine, thin, slender, slim.)
Habitat: Moist or moderately wet sites. Meadows and permanent pastures, lawns, dry, open ground. Full sun. Low drought tolerance, moderate salt tolerance. Tolerates acidic and infertile soils. Best on medium to moderately fine

textured soils. pH 5.0 – 7.5 (pH 6.0 – 7.0 preferred for lawns). distribution Introduced from Europe. Occcasionally escapes from lawns.
Culture: Plant 2 pls lbs per acre (Pasture) in fall, spring, or summer.
Description: general form Cool season, dark green, glabrous, tufted perennial bunchgrass, medium tall, 6 -12" roots sometimes with stolons or short rhizomes, spreads by rhizomes or short rootstocks. 12" minimum root depth leaves fine, rolled in the bud-shoot sheaths not compressed, glabrous, green or purplish, longer than internode on vegetative shoots, split with the hyaline margins overlapping auricles absent collar distinct, narrow, glabrous, light green, continuous or divided by the midrib, oblique ligule membranous, short (0.3 to 1.2 mm long), truncate, entire or finely toothed, sparsely and minutely hairy on back blade 1.5 to 3.5 mm wide, 2 to 10 mm long, truncate at base, sharp-pointed, flat with margins rolling in towards the apex, involute in dry weather, dark green, dull or sometimes shiny on the under surface, distinctly ridged on the upper surface, slightly keeled on under surface; margins and upper surface scabrous key features: *A. tenuis* can be distinguished from *A. alba* by its short, truncate ligule, smaller size and darker and more delicate foliage (Nowosad etal 1936).
Comments: Blooms 6 – 9. C3. Forms a compact sod or appears slightly tufted. Nutritious and highly palatable. Turfgrass. Known to chemically inhibit Azalea, barberry, yew, and forsythia. (Chick and Kielbaso, 1998). 5,890,000 to 8,700,000 seeds per pound.

ALOPECURUS Foxtails *Alopecurus* From the Greek *alopekouros*, beard grass, *(Polypogon monspeliensis*), from ἀλώπηξ, *alopex, alopek-,* fox and *-ouros,* –urous, from combining form of Greek οὐρά, *oura*, tail, the name for a grass with an inflorescence like a fox's tail. Genus of grasses found in temperate regions and having slender culms, flat leaves, and soft spikes.

Alopecurus arundinaceus Sobol CREEPING FOXTAIL
Habitat: Medium to moderately fine soils. Tolerates acidic soil but best in neutral. Full sun. Low drought tolerance, moderate salt tolerance. pH 5.6-8.4 (ecs)
Culture: Plant 1-4 pls lbs in fall or spring.
Description: general form Medium to tall grass cool season, long lived, strongly rhizomatous sod-former adapted to wet or periodically wet soils roots 12" minimum root depth spikes yellow seed heads with black seeds.
Comments: Blooms 5-9. Tolerates acidic and salty soils. Very palatable and nutritious. Pasture grass for wet meadows. Food and cover for wildlife. 786,000 to 900,000 seeds per pound.

Alopecurus carolinianus Walter [*A. geniculatus*] ANNUAL FOXTAIL
Habitat: Hydric soil seed bank species, fallow fields, a benign weed.
Description/Comments: Annual or perennial key features "Longer awns of the glumes distinguish this species from *A. aequalis,* while the shorter spikelets distinguish it from *A. pratensis* (ilpin). Blooms 5, 6. C3. Wetland "nurse crop". "Marsh fox-tail is an annual that we have found only inthe slough marshes in Sugar River bottom." (Fell 1955) Seed is occasionally for sale, but it is not a stable item in the trade.

Alopecurus pratensis Linnaeus MEADOW FOXTAIL (from Latin *pratens*, *pratensis,* growing or found in meadows)
Habitat: Meadows, open moist ground, often subject to temporary flooding. Moderate to fine textured soils, best in low lying clays and loams. Full sun. Low drought tolerance, low salt tolerance. pH 5.0-8.0
Culture: Plant 4-5 pls lbs in fall or spring.
Description: general form medium to tall, glabrous, cool-season, forming loose tufts of shoots, a bunch grass? roots rhizomatous sod former?, possibly slightly stoloniferous, 12" minimum root depth culms to 2' leaves abundant dark green foilage, rolled in the bud-shoot sheaths not compressed, glabrous, green. sometimes purplish at base, split with the broad-hyaline margins overlapping auricles absent, collar medium broad, glabrous, light green or yellow, divided, oblique ligule coarse-membranous, faintly striate, 1.0 to 2.5 mm long, truncate to obtuse, entire, ciliate, undulate or oblique, puberulent on back, variable in shape and margin blade 3 to 8 mm wide, 10 to 15 mm long, flat, taper-pointed, dull; upper surface scabrous and prominently ridged; midrib forming a slight keel on under surface; margins quite scabrous key features "spike-like panicles, flowers several weeks earlier than *Phleum pratense*, with which it can be confused (ilpin). "*Alopecurus pratensis* may be distinguished from *Phleum pratense* by its more scabrous blade margins, absence of cilia on collar and absence of notches on the ligule." (Nowosad etal 1936)
Comments: Blooms 5-9. C3. Seeded as a meadow or pasture grass. 575,000 to 580,000 seeds per pound.

AMMOPHILA Host **Marram Grass** *Ammophila* from *ammophilus*, sand-loving, from Greek ἄμμος, *ammos*, sand, *-o-,* and ancient Greek φίλος, *philos*, loving, dear, from φιλοσεον, *philoseon*, loved; loving, friendly, fond, and *–us*, Latinizing suffix; also listed as from *fileiu (phila)*, love. A small genus of coarse perennial grasses growing on sandy shores and dunes and having awnless flowers crowded into a long spikelike panicle.

Ammophila breviligulata Fern. *IL AMERICAN BEACH GRASS, aka Beach Grass, Marram, Marram Grass, Psamma, Sea Sand Grass (*breviligulatus* short-liguled from Latin *brevi*, short, and *ligula*, a little tongue.)
Habitat: Sands near Lake Michigan, other Great Lakes, and Atlantic Coast. One inland population is known near Eau Claire, Wisconsin.
Culture: The seed is not in the trade. Potted plants from The Natural Garden, bare root from Prairie Moon and Van Pines. 'Improved' selections are available.
Description: key features "blades involute above, flat at the base; paniculate inflorescence contracted to appear spikelike; callus with a tuft of hairs" (ilpin). So-called "improved" selections are available.
Comments: C3. Pollen is allergenic.

ANDROPOGON Linnaeus [at one time *Amphilophis*] **Bluestem, Beard grass, Broomsedge** (bearded-male, or man beard from Greek ανηρ, *aner,* ανδρ-, *andr-,* man, male and from ancient Greek πώγων, *pōgōn*, beard, ανδρο-πωγων, *andro-pogon*, in reference to the many species with long white hairs in the seed head, the awned male spikelet, or properly the pubescent pedicels of the staminate spikelets.) The common name bluestem is for the bluish bloom near the nodes of the culms of some species

A large and almost cosmopolitan genus (about 150 species Dayton et al 1937; 120 species FNA) of perennial grasses, widely distributed in the warmer parts of the world, with spikelike racemes having the flowers in pairs, one sterile and one fertile. Rachis joints and pedicles often bear long silky hairs. Stems are solid and pithy. Thirteen species are native to North America north of Mexico, most of which grow in the SE USA.

"No pretreatment considered necessary. In my experience, cold moist treatment has been successful. Light cover. Excellent germination." (Dunham 1993) Fresh seed does best with 2 weeks cold, then surface sow (JLH). Wind pollinated.

In the major grasses that we have been testing over the years, there is always a variation in the amount of dormant seed versus germinable seed. Most lots of grass have some percentage of dormant seed, which benefits from a cold period to break dormancy mechanisms. Cold moist treatment usually enhances germination of most grasses, activating that dormant portion of the lot. But for a good crop, moist stratification is rarely needed (gni).

Andropogon gerardii Vitman. BIG BLUESTEM, aka *Barbon de Gerard,* Beard Grass, Bluejoint Turkeyfoot, Bluestem, Forked Beard Grass, Crow Foot, Turkey Foot (for Louis Gerard, French physician and botanist, 1773-1819 who described the species from cultivated plants grown in the south of France)
Habitat: A member of most native systems, limited only by shade and extremes soil moisture. Primary or dominant species of tall grass prairie. "Characteristic of the prairie, but found in many other situations" (Mosher 1918). Mesic prairie species, hill, sand prairies, wet to mesic prairies, barrens prairie soils, moist or dry, dry open ground. Dry open woods, co-dominant with little bluestem on calcareous hill prairie, sand plains, and old fields. Wet prairies and fens. Thrives on well-drained soils. Can withstand periodic flooding and high water tables. Bottomland sites with well-drained soil. Moderately fine to coarse soils; Prefers moist soil. Not tolerant of urban flooding, but drought tolerant. Anaerobic tolerance medium, drought tolerance high, nutrient load tolerance low, salt tolerance low to medium, siltation tolerance low, shade intolerant. Wide pH range, pH 6.0-7.5. Full sun.
Culture: Easy by seed. No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment works well, cold moist stratify may help some seed lots with slightly improved and uniform germination for plant production. You can fall plant for germination in April-May, but spring planting is better. In spring plant from April to June. Successional restoration-light. Does well in pure stands or in mixed plantings. Broadcast 1pls lb per 1800 sq. ft. or drill 10 pls lb per acre. Plant 7-8 pls lbs in summer (Granite). 8-10 lbs per acre (ecs). USDA (1997) recommends 2pls lb per acre in mixes. Some experts recommend 75% Big Bluestem and 25% Indian Grass in dry to mesic plantings. Genesis does not recommend this heavy percentage with this species. What ever the seeding rate, Big Blue will dominate the planting in time.
Description: Perennial grass, warm-season, tall, columnar bunchgrass, 4.0-10', long-lived, rhizomatous bunchy sod-forming grass. 20" minimum root depth. Young shoots are flattened at base, lower leaves and sheaths covered with silky hairs. ½ " wide blue-green leaves, 3+-parted stout, purplish seed heads, "turkey foot or crow foot". Bronze to steely gray-blue inconspicuous flowers; N 2n usually 60, may also be 20, 40, 70, 80, or 90. key features "One of the most robust *Andropogons* of Illinois, with longest fertile spikelets. Spikelets in pairs; one sessile and perfect, the other pedicellate and staminate or sterile." (ilpin)
Comments: Blooms July to September. C4. Attractive dried seed heads, attractive orange to maroon fall color. Warm season, ornamental, good light reddish-purple / russet fall color, erosion control and reclamation work in sand and gravel pits, roadsides, used to stabilize soil and slow surface runoff. Useful for upland slope buffer stabilization. Aggressive, self seeds. 114,762 to 186,608 seeds per pound. "A tall coarse grass growing in large tufts on practically all prairies high and low. (*A. furcatus* Muhl.)" (Fell 1955)
Associates: Food source for Delaware Skipper. Attracts upland game birds, songbirds, small mammals, upland game birds and songbirds eat the seeds, small mammal eat seeds and leaves, and deer eat the leaves and stems, nesting cover,

provides food and cover for wildlife. Excellent palatability and very productive forage. Good pasture and hay, palatable to cattle, deer and elk, well liked by cattle.

Andropogon hallii Hackel *IA SAND BLUESTEM, aka Hall's Bluestem (for Elihu Hall, 1822-1882, American explorer and botanist who discovered the plant)
Habitat: Sand prairies. Generally on sandier sites than big bluestem. Coarse to moderately coarse soils
Culture: No treatment works well, cold moist stratify may help some seed lots with slightly improved and uniform germination for plant production. You can fall plant for germination in April-May, but spring planting is better. In spring plant from April to June, Successional restoration, light cover. Seed 4 to 6 pls lb / acre no later than mid-summer (arid west). Broadcast 1pls lb per 1300 sq. ft. or drill 16 pls lb per acre. (Stocks catalog). Plant 7-8 pls lbs per acre in late spring (Granite).
Description: Tall, warm-season, sod former. white, extremely hairy seed heads similar to *A. gerardi*, but more strongly rhizomatous. Sheath and leaf blades are smooth and hairless. 3.0-5.0', 2n = 60 (usually), occasionally 70 or 80, or 70, 100 key features Distinguished from Big Bluestem by the densely hairy branches of the flowering heads. The foliage is more gray and waxy than that of Big Bluestem, with more prominent rhizomes.
Comments: Blooms 7,8,9. Ilpin lists this as C3. Attractive dried seed heads, landscaping. Golden-yellow to reddish-brown color. Excellent palatability and very productive, useful in grazing programs on sandy range sites. Useful in erosion control on sandhills and blowouts. Attracts upland game birds and songbirds. Long-lived, warm season, tall grass, spreading by rhizomes, forms open sod 113,000 to 125,000 seeds per pound.

Rare east of the Missouri River, two native stands, one at Rasmussen's Prairie, west of Manlius, Gold Township, Bureau County. The colony was discovered by Don Prestzch, former District Conservationist, Bureau County SWCD. Don transplanted a small clump to McCune Sand Prairie (near the south parking lot) It is an Altithermal relict east of the Mississippi with an adventive occurrence at an airport in Gary, Lake County, Indiana (Birkenholz et al., 1980, Swink and Wilhelm, 1994). It is known from an inventory for Lost Mound, Carrol County, by Gleason. A second native population is near Muscatine Iowa, north side of power plant. It is also mapped from central Iowa and the Loess Hills.

Andropogon scoparius Michaux [*Schizachyrium scoparium* (Michaux) Nash.] LITTLE BLUESTEM, aka Broom, Broom Beardgrass, Broom Bluestem, Broomsedge, Bunchgrass, Prairie Beardgrass, *Schizachyrium à Balais*, Small Feathergrass, Wiregrass (From Latin *scopa*, broom, a sweeper for resemblance of tufts of stems to a crude broom)
Habitat: Probably the most abundant of all native grasses, native to 45 states, occurs in 45 or 46 of the lower 48 states (depending on the source). Mesic, dry, hill, gravel, and sand prairies, dry savannas, occasionally in wetlands. sandy or prairie soils, open woods, dry clearings, uplands or lowlands. Dry to mesic species. Intolerant of wetlands or sub-irrigated sites (Granite). Best in coarse to moderately fine soils. Anaerobic tolerance none. CaCO3 tolerance high, drought tolerance high, No inundation tolerance. Nutrient load tolerance low. Salt tolerance none. Siltation tolerance low. Shade intolerant. Neutral to basic soils, wide pH range. pH 5.5-8.4. Full sun
Culture: Established best by seed. No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment works well, cold moist stratify may help some seed lots with slightly improved and uniform germination for plant production. You can fall plant for germination in April-May, but spring planting is better. In spring plant from April to June. Seed 2.5 to 4.5 lb pls / acre in April or May (double when broadcasting (an unfounded assumption)) 1/2 to 3/4" deep (CCI). 14-20 lbs/acre broadcast or 8-15 lbs/acre drilled (Anon 1981). Broadcast 1pls lb per 3000 sq. ft. or drill 8 pls lb per acre (Stocks catalog). Granite says drill 3-4 lb pls per acre for pasture in spring or summer. Some recommend up to 75% little bluestem in dry to mesic short grass mixes, or 50/50 mix of little bluestem and side oats gramma in dry and dry mesic plantings. USDA (1997) says in mixes 1-6 pls lb per acre. In small plantings, seed @ 1 lb pls per 1000 ft. sq. or reclamation seedings at 20 pls lbs per acre (pots 2000). Genesis recommends spring planting 12 pls lb per acre in insitu soils and 20 pls lbs per acre in reconstructed soils.
Description: Perennial tufted, warm season, leafy, fine leaves, bunch grass, medium height, moderately drought tolerant with deep fibrous root system. New shoots have flat bluish basal leaves, somewhat folded along the midrib. 2.0-4.0' Awn spirally twisted and bent. 2n = 40.
Comments: Blooms 8-10. C4. Landscaping, a handsome bunchgrass, deep rooted and drought tolerant. Local genetic material has summer foliage in many shades of green and green-blues, even coppery-purple. Russet-red fall and winter color, "every color of the flame' (pots 2000). Silvery seed heads good in dried arrangements. Moderately aggressive, self-sows in bare soils, decreases under grazing pressure. Useful for improving rangelands. Numerous branched vertical roots help stabilize soil helping control erosion. 140,800 to 200,686 to 308,844 seeds per pound. Fruit is a hairy grain.

Little Bluestem is a minor player in some wetlands where it may only be evident during drought years. Even if it seems unnecessary, include this in wetland seedings.

"Half the size of big bluestem and much more slender. It often grows in large patches and is usually in dry places on high prairies, on sand and in dry open woods." (Fell 1955)

Associates: Good palatability and nutrition to livestock and wildlife. Attracts upland game birds, songbirds, and small mammals. Provides nesting cover for upland birds. Upland game birds, songbirds, and small mammals eat seeds. Deer eat leaves and stems.

With the exception of northeast Illinois and IDOT, this grass is placed in *Schizachyrium* Nees. "In *Andropogon*, the lower glumes of the sessile spikelets are flat or concave and the rame internodes are not cupulate, whereas *Schizachyrium* has convex glumes and rame internodes with strongly cupulate apices" (fna).

S. scoparium is a wide ranging species with considerable variation, some of it clinal. The Midwest has the wide ranging, highly variable, variety *scoparium*. "It is the most variable of the varieties recognized within *S. scoparium*, with morphological features that vary independently and continuously across its range, coming together in distinctive combinations in some regions. Some of these phases have been named as varieties, or even species, but they have proven to be untenable taxonomic entities when plants from throughout the range of the species are considered." (J.K. Wipff in fna.) Varieties *divergens* (Hack.) Gould (recorded from Wisconsin), and *stoloniferum* (Nash) Wipff are also recognized.

Little Bluestem has an open-pollinated, outcrossing breeding system. The further populations are apart, the more genetically different they are. (Huff 2006)

Andropogon virginicus Linnaeus *IA BROOM SEDGE, aka Broomsedge Bluestem, Virginia Beard Grass (of Virginia)
Habitat: Old fields. Grows best in rather sterile soils (Mosher 1918). Old fields, hillsides, open ground with dry infertile soil. Full sun. High drought tolerance, no salt tolerance. pH 4.9-7.0. distribution Ranges from the SE USA to northern South America, and is established in California, Hawaii, Japan, and Australia.
Culture: No treatment. Seed must be incorporated or it will blow away.
Description: Bunch grass, short, 14" minimum root depth. 2n = 20. key features "Species is tufted. Pedicellate spikelet is undeveloped with only the villous pedicels present; upper sheaths are somewhat inflated; culms are mostly glabrous; racemes are enclosed only at their bases; awns are nearly straight. Racemes are inserted singly and appearing alternate." (ilpin)
Comments: Blooms 8. C4. Used as "native" nurse crop in some Eastern restorations. Native east and south of our area. The light, fluffy seed is wind dispersed. The seed looks like Little Bluestem cross-pollinated with goose down. 250,000 (jfn2004); 260,000; 800,000 (ecs) seeds per pound. Looked upon as a weed due to its tendency to invade pastures, replacing desirable plants. Our closest observed population is a mowed roadside, Illinois Rt. 40, west side just north of Peoria, south of Singing Woods Road, though Swink and Wilhelm 1994 has it in many of the Chicago area counties.

AVENA Linnaeus 1753 **Oats, *Avoine.*** Name from the old Latin for Oats, from *avena*, *avēna,* oats nourishment, akin to Lithuanian *avia* oats, Russian *oves*. A genus of widely distributed annual grasses having a loosely paniculate inflorescence, lemmas 2-toothed and usually awned near the apex, and deeply furrowed grains enclosed in the glumes and sometimes adherent to them. There are approximately fifty-five (27, or 29) species native to Europe, the Mediterranean, North Africa, and central and western Asia. The genus has a grain crop species and significant weed species. x = 7. 2n = 14, 28, 42, 48, and 63. 2, 4, 6, 7, and 9 ploid. C3. Intergeneric hybrids with *Arrhenatherum*. Hybrids between *A. fatua* and *A. sativa* are common in plantings of cultivated oats.

Avena sativa Linnaeus OATS, aka Cultivated Oats, Naked Oats, Seed Oats, Spring Oats, Fall Oats, Winter Oats (*sativus -a -um* Latin cultivated, sown, planted.)
Habitat: Tolerates range of soil types, prefers dry soil. Medium salinity tolerance, low acid tolerance, pH 5.3 to 8.5.
Culture: Seed 60+ lbs per acre in spring in our area as a crop. Ernst says 90 lb per acre as crop, 30 lb per acre as nurse crop. (often called a cover crop.)
Description: Introduced annual bunchgrass, cereal (surreal?) crop for animal and human food *(shades of Wilford Brimley)* 1-4', cool season. 2n = 42.
Comments: Heads out 2 months after spring seeding, very good erosion control, and nurse crop for spring or fall seedings. Good wildlife value, provides food for large and small mammals, and upland birds. Very good forage value. 14,000 to 17,189 seeds per pound.

Yes Virginia, there really are Winter or Fall Oats. South of our area and in the Pacific states, Winter Oats are planted as we plant Winter Wheat. Our winters are too severe for 'winter oats' to overwinter, but maybe after 8 years of George W. Bush ...

BECKMANNIA After Johann Beckmann, 1739-1811, professor at Goettingen.

Beckmannia syzigachne *IL, MI AMERICAN SLOUGHGRASS, BECKMAN'S SLOUGH GRASS (with scissor-like glumes)

Habitat: Around ponds, swamps, and ditch banks. Best in medium to moderately fine-textured soils. moderately acid tolerant, best in neutral soils then basic.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment, saturated soils, in a monoculture plant 16 pls lbs in fall or spring.
Description: Cool-season, coarse, robust annual or short -lived perennial, sod-former. Tall grass, may develop short rhizomes. Excellent for riparian reclamation. 1.5-3.0'annual. 1,100,000 to 1,150,000 seeds per pound. Commercial variety available, which behaves as a short lived perennial.

BOUTELOUA Lagasca y Segura **Grama, Grama grass, Gramma, Gramma grass, Mesquite grass** Cited in some references as after Claudia Bouteloua, 1774-1842, Spanish horticultural writer, or more correctly it is the brothers Claudio (1774-1842 or died 1848) and Estaban (1776-1813) Bouteloua Agraz, Spanish botanists. A large North American (Western Hemisphere) genus (about 40 species) distinguished by one-sided spikes. (Spanish *grama* coarse grass, from Latin *gramina*, plural of *gramen* grass. So saying gramma grass is like saying pizza pie.) There are approximately fifty species from the United States to Argentina. Upland game birds and songbirds eat seeds. Terrestrial furbearers (esp. rabbits), small mammals, and deer eat the plant. x = 10. Black Gramma stems root at the nodes.

Bouteloua curtipendula (Michx.) Torr.* CT, KY, MI, NJ, NY, PA SIDE-OATS GRAMA, MESQUITE GRASS, TALL GRAMA (*curtipendulus –a -um* hanging down somewhat, short-hanging, from Latin *curti-*, short, and *pendulus*, hanging. The seeds are borne in two rows on one side of the seed stalk, hence sideoats.)
Habitat: Dry and sand prairies, hill prairies, dry savanna, prairie soils, dry woods, dry hills, and bluffs. Performs best on medium textured well-drained soils, found on slopes. Best in moderately coarse to medium soils, neutral to basic soils. Wide pH range, Does well on upland soils. Mesic to dry prairie and savanna. No inundation tolerance. CaCO3 tolerance high. Drought tolerance medium. Nutrient load tolerance low. No or moderate salt tolerance. Siltation tolerance low. Shade intolerant. pH 5.5-7.8. distribution According to Weakly (2007), this species is also known from Central and South America.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Germinates easily no treatment. One source in the arid southwest has drill 0.75" deep in spring or early summer, 3 to 5 pls lbs / acre. (Curtis? not advisable!!!!!) Anon 1981 says broadcast at 23-33 lbs. per acre or drill 15-33 lbs. per acre. (not advisable!!!!!) Plant 3-4 pls lbs in summer (Granite not advisable). Broadcast 1 lb pls per 2,200, or drill 10 pls lbs per acre (Stocks getting closer). USDA (1997) recommends 5 pls lbs per acre in mixes. On small projects, plant 2-3 pls lbs per 1000 ft. sq., for reclamation plant 30 pls lbs per acre (pots 2000). Genesis does not generally recommend this species in monocultures in Illinois, but in spring plant 12 pls lb per acre on *in situ* soils, and 20+ pls lbs on rebuilt soils. Seed or divisions work well.
Description: Warm season, moderately drought-tolerant, weakly-rhizomatous bunchy perennial sod-former. Perennial tufted grass. Minimum root depth 12". Moderately tall grass, 1.5-2 1/2', fine-leafed. Oat-like seed heads hanging on one side of stem. Small purplish flowers. Stems smooth with purple nodes. Leaf sheath prominently veined with few soft, long hairs. Edges of leaves have scattered hairs with bulbous bases.
Comments: Blooms 7-9. Long-lived perennial, generally a bunch grass, but some plants (northern or eastern US strains) will form loose sod. Will spread from seeds or short rhizomes gradually increase the clump size. (There are some ancient, massive clones at McCune Sand Prairie, over 20 feet in diameter.) Not as drought tolerant as Buffalo grass or Blue gramma, but more so than most native grasses. Highly palatable during spring and summer. Nutritious and palatable grass for grazing, tolerates some grazing. Sideoats is day length sensitive, do not use southern strains or seed sources! They are sensitive to winterkill. The old timers speak of early western genetic plantings having died out over time. Some consider this as a temporary matrix, and this may be a valuable insight, compared to some of the "temporary" crap that is being used.

Useful for erosion control, and in drier regions as grass between trees in orchards. Dense root system useful on steep slopes for erosion control, and mine revegetation. Non-aggressive warm season grass for wildflower plantings. To 2 feet tall, but it is very open and airy, virtually transparent with only curly basal leaves. A ripening stand has an attractive purple cast for about 2 weeks (*for purple waves of grain, for amber mountains majesty*). Provides cover and attracts grassland birds. Valuable winter forage for livestock and wildlife. Several commercial varieties available. Some western varieties will eventually die out in northern Illinois. 90,700 to 200,000 seeds per pound.

"Common on sand, dry, prairies and in dry woods. Very showy when in flower." (Fell 1955)

Bouteloua gracilis (Willdenow ex Kunth) Lagasca y Segura ex Griffiths or just (HBK.) Lag. BLUE GRAMA, MESQUITE GRASS (*gracilis -is -e* slender, gracefully slight in form.) Upland The common name is from the blue cast of a maturing stand.
Habitat: Dry and sand prairies, dry prairies, and sand hills. Most drought resistant of the major grasses of the Great Plains. Thrives on medium textured, well-drained sites. Does better than most grasses on sandy or alkaline soils. Best on medium to medium fine textured soils. Neutral to basic soils. Shade intolerant. High drought tolerance, moderate

salt tolerance. Marginally native to northwest Illinois, reported from Lost Mound (Savanna Army Depot), near Savanna, where the jack rabbits used to roam.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment, 1 to 1.5 pls lb /acre, drill 1/4 to 1/2" in April to mid-May. Anon. 1981 for some reason recommends broadcasting 60-80 lbs /acre or drilling 40-60 lbs. per acre, but importantly notes use may be limited in Illinois! Broadcast 1 pls lb per 3000 sq. ft. or drill 1 pls lb per 6000 sq. ft. Granite says plant 2-3 pls lbs per acre in summer for pastures. Sow up to 2 months before first frost. For turf, sow 3-4 pls lbs per 1000 sq. ft. Monocultures 10 pls lbs per acre (ecs). For reclamation, 30 pls lbs per acre (pots 2000). Blue grama is a very light seed, and must be raked in or mulched, or it may blow away.

Once established as lawn, mow zero or 2-3 times per year. Formerly, this species was included at 1 pls lb per acre with buffalo grass for a low maintenance turf in Illinois.
Description: Warm season, drought tolerant, long-lived, fine-leafed perennial, bunch grass that is part sod forming, short to medium tall grass. 0.5-2.0', blooms 7,8,9 with white-purplish flag-like spikelets on each stem, which curl when dry. Leaf blades are hairless, sheath hairless except for a few long hairs at junction of leaf blade. Leaf blades are thin, giving very fine textured turf. 16" minimum root depth.
Comments: Taller than buffalo grass and a little more drought-tolerant. Usually bunch grass, open-sod former but can form dense sod under close grazing or mowing, grows in bunches in the south, but as a sod-former in the north, at high elevations, or when frequently watered or grazed. Highly palatable, cures well as standing hay. Very resistant to grazing, highly palatable and nutritious year round. non-competitive in our area. Non-native or a rare native our area (Savanna Depot). Can be a good lawn grass. Now used with buffalo grass for low maintenance turf, but more adaptable and useful in the arid west. Pots (2000) says easy to establish, cold hardy, pest and disease free *(in El Paso and not the one on Rt. 251).* Useful in erosion control, roadside plantings. Provides food for wildlife. Recommended (further west) for range seeding, recreation areas, and highway medians. Several improved varieties are available, but many are of southern or southwest genetic origin. 640,000 to 850,000 seeds per pound. Allergenic pollen?

Bouteloua hirsuta Lagasca y Segura HAIRY GRAMA (*hirsutus -a -um* hirsute, hairy, covered with hair, with straight hairs, having long distinct hairs, rough, stiffly hairy. From Latin for rough, shaggy, bristly, prickly, hirsute, or rude, unpolished.)
Habitat: Open, somewhat disturbed areas in dry, sand, gravel, and limestone prairies.
Culture: No treatment.
Description/Comments: 0.5-.75' Blooms 7-9. Warm season, bunch grass, non-competitive. 800,000 to 1,120,000 seeds per pound.

BRACHYELYTRUM Palisot de Beauvois **Shorthusk** From Greek *brachys*, short and *elytron*, *elutron*, cover, husk for the small glumes. A small genus of one or two species in North America and one in eastern Asia, *B. japonicum* (Hackel) Matsumura ex Honda, (contrary to ilpin). The Asian species, when included in *B. erectrum*, is variety *japonicum* Hackle, or subsp. *japonicum* (Hackel) T. Koyoma & Kawano. Many species exhibit this classic disjunct distribution. C3. Placed in the *Stipoideae,* or sometimes in its own tribe, the *Brachyelytreae,* but at least closely allied to the *Bambusoideae.* x = 11. 2n = 22. 2 ploid.

Brachyelytrum erectum (Schreb. ex Spreng.) P. Beauv. LONG-AWNED WOOD GRASS, aka Bearded Shorthusk (Latin *erectus* upright, perpendicular)
Habitat: Mesic savannas and mesic woodlands.
Culture: Fall plant or cold moist stratify. This plant is not in the seed trade.
Description: culms 1.0-2.5' key features: "Versus immature *Bromus*, this species has a single flower." (ilpin) This plant can be positively identified by the shattered venation in the leaves.
Comments: Blooms 6,7 Landscaping, cool season, bunching. 39,467 to 45,300 seeds per pound. "An uncommon grass which we have found in Ashley Forest preserve and in Andrus woods on Mulford road near Harrison avenue road." (Fell 1955)

BROMUS Linnaeus 1753 **Brome** New Latin, from Latin *bromos*, a name used by Pliny for oats from ancient Greek name for oat, originally from βρῶμα, *broma*, βρόμος, *bromos*, food, also βρῶμος, *bromos,* oats. A large genus of annual, biennial, and perennial grasses native to temperate and cool regions, having large often-drooping spikelets and lemmas usually awned near the 2-toothed apex. Depending on how the species are defined there are between 100 and 400 species in the genus. There are 52 species in northern North America, with 28 species native. Only three introduced species are perennial. x = 7.

No pretreatment considered necessary. "In my experience, cold moist treatment has been successful. Light cover. Good germination." (Dunham 1993). An old turf salesman told me the germination of some species of brome is said to improve after storage (*B. inermis*), but our seed test data show serious decline in viability during storage in some native bromes. They don't carry over well. Buy early and buy often.

An examination of the use of species names for Midwestern native bromes is confusing at best, and might make you crazy. If you seek clarity, do not speak of *Bromus purgans* in specifications.

Bromus ciliatus Linnaeus FRINGED BROME, aka *Brome Cilié,* Fringed Brome-grass, Canada Brome Grass (*ciliatus -a -um* ciliate, with marginal hairs, fringed with hairs like an eyelash or eyelid).
Habitat: Moist soil in natural meadows and in open woods. Wet meadows, marshes and sedge meadows. Woods, clearings, and meadows, often with rocky soils. Moist open woods, rocky slopes, disturbed areas near bogs. Shade tolerant. Low drought tolerance. Low salt tolerance. pH 5.5-7.5.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Dry storage 40 (180) or cold moist stratify (30), light.
Description: general form Tall perennial, 1.5 to 4' leaves rolled in the bud-shoot sheaths not compressed, not keeled, retrorsely pilose, closed to within 1 mm of summit auricles absent collar narrow, distinct, glabrous, pale green, divided by midrib; margins sometimes constricted ligule coarse-membranous, short (0.5 to 1 mm long), truncate, entire or slightly lacerate blade 4 to 10 mm wide, 8 to 20 mm long, flat, tapering to a sharp point, soft-pubescent, dark green, slightly ridged on upper surface; midrib distinct on under surface; margins scabrous spikes spikelets tinged with green-to purple bronze key features: "Most Illinois specimens have middle and upper sheaths which are retrorsely pilose." (ilpin) "This species is distinguished from *B. tectorum* by its shorter ligule, and from *B. inermis* by its longer pubescent sheath and blade. (Nowosad etal 1936)"
Comments: Blooms 6,7. C3. Attractive dried seed heads, cool season, bunching, short-lived, often flowering first year. Pollen may be allergenic. 104,753 to 160,000 seeds per pound. "A common native species." (Fell 1955)

Bromus inermis Leyss. SMOOTH BROME, aka Awnless Brome Grass, Hungarian Brome
Habitat: Best on moderately coarse to moderately fine soils. Best on well-drained, fine-textured soils, especially loose, sandy loams. Somewhat acid tolerant, but best on neutral or basic soils. Used extensively in northern parts of US for early season pastures. Full sun. Moderate drought tolerance. Low salt tolerance. pH 5.5-8.0.
Culture: Plant 8 pls lbs per acre in fall or spring. Drill 10-12 pls lbs per acre in spring or fall. Drill 10-12 lbs per acre in spring or fall (Stocks)
Description: Introduced, rhizomatous, cool season moderately drought tolerant, long-lived perennial vigorous sod-former, medium tall grass, 1.5-3'. Creeping, scaly rootstocks. 12" minimum root depth leaves rolled in the bud-shoot sheaths not compressed, slightly or not at all keeled, glabrous or the lower rarely sparse-pubescent, scabrous, closed to near the summit auricles absent or rarely rudimentary collar narrow, glabrous, light green, divided ligule membranous, short (about 0.5 mm long), obtuse, entire or slightly lacerate, blade 4 to 12 mm wide, 15 to 40 mm long, flat, tapering to a sharp point, glabrous but sometimes minutely pubescent on both surfaces, dark green, almost ridgeless above, slightly keeled below; margins scabrous 2N = 28, 56. key features: "Spikelets are purplish or bronze-colored at maturity" (ilpin) Distinguished from the other species of *Bromus* by its glabrous, or nearly glabrous, sheaths and blades.
Comments: Adapted to deep soils. Tolerant of light shade. Very productive, but persistent and weedy. Starts growth in early spring. Blooms May to July. Ripens by early summer, abundant late-summer and fall regrowth. C3. Aggressive, rhizomatous root system that tends to become sodbound without proper management. Said to be aggressive in the pasture, as it may tend to crowd out other species over time. Do not use with warm season grasses or wildflowers. Pollen may be allergenic. Highly palatable to livestock when green. Fair palatability to wildlife. Known to chemically inhibit *Populus* species. 125,000 to 142,000 seeds per pound.

Broadcasting seed or seed trash, or no-tilling seed into burned stands of *B. inermis* works well with many species. Plugs also work well in brome stands.

Some moist years this grass is more appropriately called *Bromus enormous*. "A common introduced species which has escaped from cultivation." (Fell 1955)

Bromus kalmii A. Gray *ME, MD, NH PRAIRIE BROME, aka Arctic Brome, Brome de Kalm, Kalm Brome, Wild Chess (named for it's discoverer, Pehr Kalm, 1715-1779)
Habitat: Mesic prairies and calcareous fens. Sandy, gravelly, or limestone soils in open woods and calcareous fens. In the eastern US it grows in shale woodlands and barrens. Adapted to coarse and medium textured soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 5.7-7.0. distribution north ½ of Illinois
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Cold moist stratify (30)-light. Growth rate rapid. Seedling vigor medium. Vegetative spread rate none. Spreads slowly from seed.
Description: general form Perennial, not rhizomatous culms 1.5-2.0' N 2n = 14 key features: Distinctive for its few leaves, usually 3-4 clustered near the base, and the spikelets large and approximate to one another in a narrow nodding panicle.
Comments: Blooms 6,7. C3. Attractive dried seed heads, landscaping, cool season, bunching, short lived behaving as annual or biennial in the nursery. 128,000 to 210,771 seeds per pound. "An uncommon native perennial species that is found mostly in the sand area." (Fell 1955)

Bromus latiglumis (Shear) A. S. Hitchcock *MD EAR-LEAVED BROME, aka Auricled Brome, Broad-glumed Brome, Earlyleaf Brome, Flanged Brome, Flanged Woodbrome, Hairy Wood Brome, Riverbank Brome, Wild Brome Grass, Wood Chess, *Brome à Larges Glumes* (*latiglumis* broad-glumed, from Latin *latus*, broad, wide, and *glūma* (rare) hull, husk of grain.)
Habitat: Mesic savanna, thickets, moist open woodlands. Rich alluvial thickets and woodlands. Limestone soils. Shaded or open woods, along streambanks, and on alluvial plains and slopes. distribution Occasional in north ½ of Illinois, rare south.
Culture: Fall or winter sown in unheated cold frame works well for us. Light soil cover. Dry storage 40 (180) / cold moist stratify (30), light.
Description: general form Perennial, not rhizomatous culms 2.5-4.5', 9-20 nodes leaves dense leafy growth N 2n = 14.
Comments: Blooms 8-9. C3. Attractive dried seed heads, landscaping. May be short-lived. 107,101 to 118,537 seeds per pound. Seed production plot does well in full sun, BUT is short lived; modestly self sows, moving about the woods on its own. Not competitive with *B. inermis* in full sun, but few C3 native grasses are. This species is easier to identify than to scientifically name.

"An uncommon native perennial that is found mostly in open woods. Edges of woods on Cunningham Road west of Rockford, on Mulford Road east of Rockford, and east of Harrison." (Fell 1955)

Associates: Pollen maybe allergenic.

Generally, the common name EAR-LEAVED BROME conveys the concept of this species. Unfortunately, this common name is also used for *B. racemosa* L. in Jones and Bell, 1974.

Bromus pubescens Muhl. ex Willd. *ME, NH WOODLAND BROME, aka Canada Brome, Canada Brome Grass, Common Eastern Brome, Hairy Wood Brome Grass, Hairy Brome-grass, Hairy Wood Chess, Arctic Brome (*pubescens*, becoming hairy, from Latin *pubescens*, *pubescent*, from *pubesco*, to reach puberty, become pubescent.)
Habitat: Mesic savannas, mesic forests, generally on rocky slopes.
Culture: 30 (21) days cold moist stratification (pm 09). Cold moist stratify (30), light. Two weeks cold moist stratification at 45ºF improves germination (Davis and Kujawski 2001).
Description: 1.5-3.0, 2N = 14.
Comments: Blooms 6,7,8. C3. Attractive dried seed heads, landscaping, bunch grass. 93,995 to 135,300 seeds per pound.

"A native found occasionally in damp woods as in Ingersol Park west of Rockford and in the woods west of Roscoe." (Fell 1955, as *B. purgans* L.) Fell (1955) lists *B. ciliatus, B. kalmii. B. latiglumis*, and *B. purgans* for Winnebago County.

BUCHLOË Englm. **Buffalo grass** New Latin, a contraction of *Bubalochloë* from Latin *būbalus*, Greek βούβαλος, *boubalos*, buffalo, or Greek *bous*, cow, ox or head of cattle, and χλοη, *chloë*, young grass, similar to Greek *chloos* light gree A genus of perennial stoloniferous, sometimes mat-forming, grasses having pistillate and staminate spikelets borne on the same or separate plants, the pistillate in sessile capitate clusters and the staminate in elongated one-sided racemes. A monotypic genus. C4. x = 10.

Buchloë dactyloides (Nutt.) Engelm) *IA BUFFALO GRASS, aka Early Mesquite (from Greek *dactylos*, meaning finger, and *oid*es, like, maybe because of leaf shape or for resemblance of the male flowers to the inflorescence of *Dactylis*, orchard grass)
Habitat: Dry prairies. Adapted to medium and fine textured soils. Anaerobic tolerance high (USDA?). CaCO3 tolerance high. Drought tolerance high. Salinity tolerance high. Shade intolerant. pH 6.5-8.0.
Culture: Do not sow untreated seed. Commercial seed is given a sodium hypochlorite treatment to break down the seed coat or potassium nitrate to improve germination. Slow to establish unless treated with potassium nitrate. Treated seed is died, usually green, as an indication of treatment. Slow growing, slow to establish. Pasture seeding rate 8 to 10 pls lbs / acre (4-8 lbs. Granite seed in spring!). Lawn seeding rate 2 to 4 pls lbs per 1000 sq. ft. sown when soil temperatures are warm enough to insure germination. Reclamation seeding rate in arid SW, 40 pls lbs per acre in spring, summer or fall (pots 2000). Turf seeding rate 3-4 pls lbs per 1,000 sq. ft. (pots 2000). Seeding rate for Bison, residential lawns, athletic fields, commercial sites, parks and recreation 1-3 pls lbs per 1000 ft sq.; soil stabilization, 10-20 pls lbs per acre; for pasture or range, highway, Right of ways 6-8 pls lbs per acre (rate not recommended in Illinois). Genesis recommends 4 pls lbs per 1000 for turf in Illinois. It is establishment management intensive. With adequate moisture, germination occurs in 14 to 21 days. Growth rate moderate. Seedling vigor high. Vegetative spread rate rapid. Spreads slowly from seed.
Description: Short, warm season, long-lived perennial sod forming grass, with vigorous stolons. (*In some references it is said to have rhizomes, but many bunch grasses have very short rhizomes.*) 4" to 8" tall. 12" minimum root depth. 2n = 20, 40, 56, 60. 2, 4, 6 ploid.
Comments: Blooms 7,8. C4. Tolerates grazing well and stoloniferous habit (runners) helps soil stabilization. A rare native in our area but more common west. Buffalograss is the most important constituent of the short-grass prairie. 40,000 burrs per pound to 335,360 seeds per pound.

Jones (1958) considered the stand in Springdale Cemetery, Peoria, Illinois as native. Useful as a low maintenance turf, but is more suited to arid areas than northern Illinois. When established, forms a sage-green lawn, green late spring to early fall, and beige the remainder of the year. It is tolerant of drought, cold winters, poor soil, and foot traffic; it is immune to pests and most diseases, unless watered and fertilized too much. Buffalograss may go dormant in hot dry summers, but will green up when rains return. Buffalograss turns brown as the weather cools in the fall and does not green up until warm weather, well after your neighbors Kentucky Bluegrass is bright green. Does not compete well with weeds and aggressive grasses like blue grass and Bermuda grass. These must be eliminated before establishing buffalo grass. Durable once established, but needs dormant-season weed control almost annually in the high rainfall TALL grass prairie. Best in semi-arid areas, with 10-25 inches of precipitation, not in 35" of precipitation.
Associates: An important dry-land pasture grass, it is extremely palatable to livestock and wildlife, but said by Martin et al (1951) to be of low food value to large mammals and upland birds.

A recent study (Columbus 1999) recommends including buffalograss in the genus *Bouteloua*, as *Bouteloua dactyloides* (Nutt.) J.T. Columbus.

CALAMAGROSTIS Adanson **Reed Bentgrass, Reed Grass, Small Reed** New Latin from Latin *calam* and *agrostis* couch grass, from Greek *calamos*, reed, cane, and *agrostis*, for grass, field grass, green provender, or perhaps a dog's tooth grass, perhaps from *agros*, field. Our word acre has its root in Latin *ager* and Greek *agros*. About 230 species in the north and south temperate zones. "No pretreatment is considered necessary in my experience, cold moist treatment has worked well. Very light cover. Very good germination." (Dunham 1993)

Calamagrostis canadensis (Michaux) Pasilot de Beauvois BLUE JOINT GRASS, aka Bluejoint, Bluejoint Reedgrass, Canada Bluejoint, Canadian Reedgrass, Marsh Pinegrass, Marsh Reedgrass, Meadow Pinegrass. (of Canada or NE USA.)
Habitat: Wet meadows, wetland and riparian sites. Swamps and meadows. "Bluejoint grass is common in marshy places and along ditches throughout the county." (Fell 1955) Best in medium coarse to moderately fine soils, acid to neutral soils, somewhat tolerant of basic soils; Prefers saturated soils. Tolerates temporary spring flooding, up to 6". Low drought tolerance. Not tolerant of permanent flooding. Nutrient load tolerance low. Salt tolerance low to none. Siltation tolerance moderate. Full Sun. pH 4.5-8.0.
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). Hulled seed needs no treatment, and can be dry stored in the refrigerator for a year or two. Easy from dry stored seed in the green house. In properly prepared soils, especially in situ soils, Blue joint may spread aggressively by rhizomes. When field sown, soil should be moist to saturated, but not inundated. In western montane pastures, plant 2 pls lbs per acre in fall or spring (Granite) (extremely cost prohibitive with local seed sources). In mixes, plant 0.03-0.06 pls lbs (fluffy seed) per acre (USDA 1997) Plant plugs or divisions on 0.5-1.5" centers. In many constructed wetlands, plugs are more successful than direct seeding, but plugs may spread slowly due to compacted soils. Division of mature clumps.

Individual populations vary widely in seed production from year to year. Seed viability may be low in some lots that are not hulled. Established stands may be mowed in alternate years for maintenance (USDA 1997)
Description: Perennial tall grass cool season, sod forming, robust 2.5-4.0 (5.0), flower color "brown". Blue green foliage. 16" minimum root depth.
Comments: Blooms 5-6. Used in wetland restoration, natural landscaping. Useful in upper shoreline zones and vegetated swales. Performs well at low and high elevations. Can be a dominant grass in the northern part of it's range. Can be aggressively rhizomatous. 3,057,239 to 4,540,000 seeds per pound.
Associates: Waterfowl eat seeds. Deer and muskrats graze new growth. "Said to make excellent hay" (Mosher 1918) Good forage producer and highly palatable when young, but poor palatability when mature. Provides food and cover for muskrats, deer, and moose.

Calamagrostis inexpansa A. Gray **brevior** (Vasey) Stebbins *Ct, ME, NH, NY, VT BOG REED GRASS, aka Bentgrass, New England Northern Reed Grass, Neglected Reed Bent-grass, Northern Reedgrass, Reed Bentgrass, Reed Grass. (*inexpansa* unexpanded, *brevior* shorter, from Latin comparative of *brevis*, short; little, *-ior*, to a greater degree)
Habitat: Wet meadows, moist marly or peaty ground. Wet meadows, shallow marshes, springs, boggy areas, shores and stream banks. In drier habitats than *C. canadensis*, ranging to mesic prairies, such as Pioneer Cemetery, Camp Grove, also growing along the south fence in the lower but not wet part of County Line (Foley) Prairie, north of Hannaman. Adapted to fine and medium textured soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance medium. Shade tolerant intermediate. pH 5.5-8.0.
Culture: Clone. Seed needs no treatment, preliminary data indicate the hulled seed is nondormant. Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate (USDA).

Description: 2.0-4.0' Resembles *C. canadense*, stems more erect and stout, foliage glaucous, leaf blades stiff, often involute, and panicle is contracted, dense, somewhat beige to brown colored.
Comments: Blooms 6-7. Landscaping, wetland restoration, cool season, aggressive, sod former. 3,546,875* seeds per pound. "Not uncommon in the Sugar River and Coon Creek area and along drainage ditches east of Durand." (Fell 1955)

CALAMOVILFA Hack. [or (A. Gray) Hackel ex Scribner & Southworth] **Sandreed** (Greek *calamos*, reed, and *vilfa*, from another genus of grass; alternately *calamo* may be from the Greek mythological figure *Kalamos*, the son of *Maiandros* (*Meander*), god of the Meander River.) *Calamovilfa* is native to eastern and central North America and consists of five (4) species. *Calamovilfa* superficially resembles *Calamagrostis* and *Ammophila* in gross characteristics, and has been placed close to them in the tribe *Agrostideae* by Hitchcock (1951), but they differ in important characteristics. *Calamovilfa* is related to *Sporobolus*, with both having a fruit unlike most grasses with its pericarp free from the seed coat. Molecular phylogenetics suggest *Calamovilfa* should be included in *Sporobolus* (Ortiz-Diaz & Culham 2000). C4. The fruit is an achene, not a caryopsis (Gould and Shaw 1983).

Calamovilfa longifolia (Hook.) Hack. var. **magna** Scribn. & Merr. *WI PRAIRIE SANDREED, aka Big Sandgrass, Long-Leaved Reed Grass, Prairie Sandgrass, Sandreed, Sand-reed Grass (long leaved, *longus* for long, extended, and *folius* for leaves)
Habitat: Dry sand prairies and sand savannas. Loose sands, abundant on the shores of Lake Michigan, well drained sites, especially deep sands. Adapted to coarse and medium textured soils. Anaerobic tolerance none. CaCO3 tolerance high. Drought tolerance high. Fertility requirement high. Salinity tolerance low. Shade intolerant. pH 5.6-8.4, somewhat tolerant of acidic and basic soils.
Culture No pre-treatment necessary other than cold, dry stratification (pm 09). Genesis limited data indicates that some lots benefit greatly from cold moist stratification. Drill 4 to 7 pls lbs per acre in early to mid spring, doubling rates for harsh erosive sites. Plant 3-4 pls lbs per acre in spring. On small projects seed 1 lb pls per 1000 sq. ft, or 10 pls lbs per acre for reclamation (pots 2000). Actual seeding rates will vary by region and with the degree of seed processing provided by the seed producer. Seed must be planted at a depth that insures adequate moisture, but does not preclude seedling emergence. Division of mature clumps, caution sharp rhizomes.

Variety *magna* germinates well after dry stratification (gni). Growth rate moderate. Seedling vigor medium. Vegetative spread rate rapid. Spreads slowly by seed.
Description: Perennial grass 4.0-6.0' tall, warm season, spreading underground by long, strong rhizomes, open sod-former with 18' long beige seedheads. Old, large clones flower and fruit only on the edge of the clone. 2N = 40.
Comments: Blooms 7-9. Landscaping, very attractive, but not for use in small plantings. The dense wiry root system provides good erosion control in sandy soils. Dangerously sharp, long scaly rhizomes; use caution when transplanting or dividing. Drought resistant, competitive. Western seed counts, probably from the var. *longifolia*, not var. *magna*; 226,800 to 274,000 seeds per pound. Variety *magna* 133,333 to 210,380 seeds per pound.

Sandreed is a C4 grass, but it resumes growth earlier in spring than most warm season grasses. Great Plains genetic material is subject to rust when grown in regions of high rainfall.
Associates: Moderately palatable to livestock and wildlife in late spring to early summer, can be important forage on winter ranges. Songbirds and small rodents eat seed.

CHASMANTHIUM Link formerly included in *Uniola* Linnaeus **Sea Oats, Sprangle Grass, Spike Grass**
Chasmathium is an old Latin name for a plant, from Greek *chasma*, yawn, and *anthos*, flower, for the gaping glumes that expose the grain. A small genus (5 species), endemic to south east North America, of showy perennial grasses having ample panicles of 2-edged spikelets of which the lowermost glumes are empty and including several that are valued as sand stabilizers. x = 12.

One source states there are 9 species of Chasmanthium, all American species, and 9 species of Uniola from North, Central, and South America. (*Uniola* New Latin, from Late Latin, a kind of plant, probably from *unio* oneness, unity, union, alternately from from the Latin *unione glumarum*, meaning united bracts, apparently a reference to the spikelets). Current usage limits *Uniola* to a species in Florida and one that ranges from Mexico to Ecuador.

Chasmanthium latifolium (Michaux) H. O. Yates *MI NORTHERN SEA OATS, aka Broad Leaf Chasmanthium, Broad Leaf Uniola, Broad Leaf Wood-oats, Creek Oats, Fish-on-a-pole, Indian Woodoats Grass, Indian Sea Oats, River Oats, Sea Oats, Spike Grass, Wild Oats (wide-leaved, broad leaved, from Latin *latus*, broad, wide, -*i*-, and, *folium*, leaf)
Habitat: Moist soil, rocky streambanks, rare, on shaded, open floodplains. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant, but will tolerate full sun. pH 5.0-7.0. (or 6.0-8.0) distribution Common in southern 1/2 of Illinois, rare or represented by escaped or cultivated specimens only north ½. Illinois is on the northern edge of this plants range.
Culture: Fall plant (Cold moist stratify Ken Schaal). 60 days cold moist stratification (pm 09). We have had good germination with outdoor treatment. A fall 2006 seed test showed a lot that was nondormant. Growth rate moderate.

Seedling vigor medium. Vegetative spread rate moderate. It does not naturalize from seed in our area, but is known to rapidly do so elsewhere. It is only half hardy and short lived in our experience. May need staking or other support.
Description: 2.0-4.0'. Clump-forming, upright to narrow arching. Large flat ornametal, drooping spikelets of flattened "oats" and broad leaves. 10" minimum root depth. 2n = 48. A friend once described the seeds as "elephant-sat-on flat".
Comments: Blooms 8-9. Works well in fresh and dried flower arrangements. Highly ornamental, attractive in the landscape, but it is marginally hardy in northwest Illinois and can be short lived. Native south of our area, but for reasons known only to landscape architects and "restoration ecologists" it is still specified as native in northern Illinois seed mixes. Seed heads reddish or purplish-bronze in late summer. Copper fall color turning salmon to brown by winter. 64,000 to 96,141 seeds per pound. Flowers are sometimes cleistogamous.

The seeds have been used to make bread, biscuits, flour, and mush. (Kunkel 1984, Moerman 1998)
Associates: *C. latifolium* is a larval host of Linda's Roadside-Skipper (*Amblyscirtes linda*) (southern Illinois), the Common Roadside-Skipper (*Amblyscirtes vialis*), Bell's Roadside-Skipper (*Amblyscirtes belli*) (southern Illinois), and Northern Pearly Eye (*Enodia anthedon*). Sea Oats is of minor food value for large and small mammals and upland birds. Songbirds, and occasionally northern bobwhite quail eat seeds. Foliage is palatable to grazers and browsers.

CINNA Linnaeus 1753 **Woodreed** About 4 species of temperate Eurasia, North America, and South America.

Cinna arundinacea Linnaeus COMMON WOOD REED, aka Reed Grass, Sweet Woodreed
Habitat: Wet savannas, wet woodlands, thickets. Woods, swamps, wet meadow. Adapted to coarse, medium, and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 4.0-8.5.
Culture: We have had luck fall planting this one, but some lots may only require cold dry storage prior to seeding. Cold moist stratify or fall plant. "Cold moist treatment or fall sow" (Dunham 1993). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate moderate.
Description: Bunch grass, 2.5-4.0', 16" minimum root depth.
Comments: Blooms 8-9. C3. Forms open sod. Attractive seed heads. Provides food for wildlife. 897,233 to 1,493,421 seeds per pound. "Stems single or a few. Usually in wet woods, at times along sloughs and drainage ditches." (Fell 1955)

DANTHONIA DC. **Oatgrass** *Danthonia* New Latin, irregular from Étienne *Danthoine*, of Marsielles, France, 19th century botanist & New Latin *–ia*. A large genus of tufted erect perennial grasses chiefly of the southern hemisphere and North America with narrow leaves and small terminal panicles or racemes of densely crowded florets. About 20 species in northern hemisphere. x = 6, or 9 (?). 2N = 18, 36, and 48. 2- and 4-ploid.

Danthonia spicata (L.) Beauv. ex Roemer & J.A. Schultes POVERTY OAT GRASS, aka Curly Grass, Curly Oat Grass, Poverty Danthonia, Poverty Grass, Wild Oat Grass (*spicatus -a –um* with flowers in a spike, spicate, bearing a spike, from Latin *spicatus*, past participle, *spico*, to grow ears, spikes, like wheat)
Habitat: Dry and sand savannas, oak openings, dry and poor sandy or gravelly soils. Does not like competition, not found in fertile soils. Dry, nutrient-poor oak savannas, old fields, and grassland openings. "Common in dry woods. Rock Cut and Sewards Bluffs Forest Preserves." (Fell 1955) This species is an indicator of poor nutrient and poor moisture regimes. It may become a dominant in depleted pastures. Tolerates pH as low as 4.5-4.7. distribution Widespread native grass.
Culture: Cold moist stratify or fall plant. Cold moist stratify (Ken Schaal). Alternately, no pre-treatment necessary other than cold, dry stratification (pm 09). Acid scarification is recommended by some for pretreating large lots of seed. Potassium nitrate treatment has also been shown effective.

Poverty Oatgrass seed is highly dormant and may form a long-term (decades) soil seed bank. This seed bank may persist after all aboveground populations are gone, but will be stimulated by fire or other disturbances. (Scheiner 1989) Some populations may be drought dependent, not fire dependent. Reproduces by seed and by tillering.
Description: general form Perennial, light green, bunch grass, 0.9-2.0' leaves folded in the bud shoot sheaths not compressed, not keeled, ususlly pilose-pubescent, pale green to white, split to base auricles absent collar narrow, continuous, with longhairs on margins, lighter in color than the blade ligule a fringe of hairs 0.2 - 1.2 mm long blade 2 to 3 mm wide, basal leaves 5 to 15 mm long, not keeled, very sharply pointed, flat with margins becoming involute in dry weather, twisted and curled when dead, generally sparsely pilose but often glabrous; upper surface dull green or glaucous, ridged near midrib; under surface bright green, sometimes glossy, not ridged; margins slightly scabrous.
Comments: Blooms 5,6. C3. Although it grows in 46 states, *Danthonia* is extremely poorly represented in the seed trade. It is sold as packets by a native nursery near St. Louis, or as Minnesota ecotype. Local seed is sometimes available. Non-competitive, short-lived. This species produces normal chasmogamous flowers and almost-basal, cleistogamous flowers that are beyond the reach of cattle and rarely grazed. 522,740 to 546,988 seeds per pound.

Associates: *Danthonia spicata* is considered obligately mycorrhizal (Darbyshire and Cayouette, 1989). Over much of its range, *D. spicata* is infected by the epiphytic fungus *Atkinsonella hypoxylon* (Balansiae). *A. hypoxylon* is specific to *Danthonia.* (Clay 1994)

" Uninfected *D. spicata* produce two flower types. Potentially outcrossed, wind pollinated chasmogamous flowers are produced at the tip of the reproductive stalk. Obligately self-fertilized cleistogamous flowers are produced in the axils of the leaf sheaths along the reproductive stalk. In infected plants, a fungal sclerotium, or "choke," is produced at the initiation of host plant flowering and causes abortion of all but a few infected cleistogamous seeds at the base of the much-reduced reproductive stalk. Plants infected by *A. hypoxylon* often have higher growth rates than uninfected plants and so this symbiosis is generally considered mutualistic." (Diehl, 1950, Clay, 1984, 1990a in McCormick et al., 2001) McCormick et al. (2001) found that infection may be disadvantageous in stressed plants and may lead to death during extreme stress.

Poverty Oat Grass is of minor food value to upland birds, but of poor palatability to most wildlife. It is grazed by cattle when it is young, but it soon becomes wiry, tough, and unpalatable.

DESCHAMPSIA Palisot de Beauvois **Hairgrass** Named for Jean Louis Auguste Loiscleur-Deslongchamps, a French botanist, 1774-1846 (1849?). A genus of perennial grasses of cold and temperate regions having loose or compact panicles with 2-flowered spikelets. There are over 50 (40) species of temperate and cold regions, mainly in the Northern Hemisphere.

Deschampsia caespitosa (Linnaeus) Palisot de Beauvois subsp. **glauca** (Hartman) Hartman (also spelled *cespitosa*) TUFTED HAIR GRASS, aka Small-flowered Tickle Grass (*caespitosus -a um* growing in tufts, tufted, clumped, clump-forming, from *caespes,* a turf, sod; or field; *glaucus* gray, bluish-green or gray, covered with 'bloom', from Latin *glaucus -a -um* bluish- or greenish-gray, from Greek γλαυκός*, glaucos*.)
Habitat: Intermittent wet spots in old dolomite quarries, calcareous seeps, cool limy springs, moist sites Best in medium to moderately fine soils. Neutral to acidic soils. For var. *glauca*, shores, mountains, and damp, often calcareous soils (Fernald). distribution A complex circum-boreal species.
Culture: No treatment other than cold dry stratification. Drill 2-3 lb pls per acre in fall (granite).
Description: Cool-season, leafy, densely tufted, medium tall perennial bunchgrass flowers. The wide-ranging var. *glauca*, bluish green, with a lax, diffuse panicle.
Comments: Blooms late May to late June. Landscaping, commonly sold as an ornamental grass. Very palatable to livestock and wildlife. Larval host of *Thymelicus lineola*, European Skipper (Skipperling). 1,085,349 to 2,500,000 seeds per pound.

DIARRHENA P. Beauv. **Beakgrain** From the Greek *dias*, twice, and *arren*, male, referring to the two anthers. Perennial grasses of rich woods, two (one) species in eastern North America, x = 10, four species in eastern Asia, x = 19, sometimes separated as *Neomolina* Honda.

Diarrhena americana Palisot de Beauvois *MD, MI, WI (NY, PA) BEAK GRASS, aka American Beakgrain, Twin Oats (*americanus -a -um* of the New World, American; *obovata* inverted ovate, egg-shaped with the large end up.)
Habitat: Mesic red oak savannas and wet savannas; mixed deciduous forests. In southern Michigan, this grows in floodplain forests, as was noted by Pepoon (1927) for the Chicago area. Prefers rich moist soils. Partial shade to full shade.
Culture: 60 days cold moist stratification. Seeds germinate most successfully in cool soil (pm 09). Easy from seed. Cold moist stratify or fall plant.
Description: 1.5-3.0' Spreads vegetatively by shallow rhizomes and can form large clones. The relatively long, shiny leaves with an off-center midnerve and unusually shaped, bottlenose seeds are distinctive.
Comments: Blooms 7,8. Late flowering, but a cool-season grass. Ornamental. Excellent woodland fuel. 40,000 to 62,423 seeds per pound. O'Connor and Penskar (2004) suggest the large seeds are an adaptation for dispersal by floodwaters, but we have never seen this in a floodplain.
Associates: No serious insect or disease problems. Wild turkeys eat seeds.

DICHANTHELIUM (A. S. Hitchc. & Chase) Gould. **Rosette Grass, Witch Grass**. The rosette-forming panicums. These grasses often form basal winter rosettes of leaves with short ovate to lanceolate blades that are often very different from the cauline leaves. From Greek *di,* twice and *anth,* flowering, referring to the two flowering periods of many species. Approximately 72 species, 34 in US and Canada. X = 9.

Dichanthelium plants perennial; basal leaves form winter rosette; photosynthesis C3; primary panicles terminal, developing April-June or July, at least partially chasmogamous, secondary panicles June to fall, partially or totally cleistogamous.

Panicum plants annual or perennial; no basal rosette; photosynthesis C4 or C3(?); primary panicles terminal or axillary, appearing after mid-summer, chasmogamous.

Dichanthelium clandestinum Linnaeus (Gould) BROAD-LEAVED PANIC GRASS, aka Deer Tongue, Deer-Tongue Grass, Corn Grass.
Habitat: Moist shaded ground where soils are sandy and somewhat acid, drier sandy soils, and near streams in shady areas. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance high. Fertility requirement low. Salinity tolerance low. Shade tolerance intermediate. pH 4.0-7.5.
Culture: Seed 10 lbs per acre alone. Low seedling vigor. Moderate growth rate.
Description: native grasslike perennial, or plants annual, without creeping rootstocks, plants generally smooth throughout, flowers 3-merous.
Comments: Blooms 6-9. C3. Good for erosion control in acid mine spoils. Provides food and cover for wildlife. 45,008 to 280,000 seeds per pound.

Dichanthelium oligosanthes (Schultes) Gould **scribnerianum** (Nash) Gould *NY, PA SCRIBNER'S PANICUM, aka Scribner's Rosette Grass, Scribner's Witch Grass,Velvet Panic Grass
Habitat: Mesic dry, and sand prairies.
Culture: Fresh seed, no treatment. No pre-treatment necessary other than cold, dry stratification (pm 09).
Description: Native grasslike perennial, 0.5-1.5', leaf blades short and rather broad, distributed along the culm, panicle as long as broad, but not densely flowered, spikelets blunt.
Comments: Blooms 5-7, remontant 7-10. C3. Landscaping. 144,000 to 148,148 seeds per pound. "Common on the gravelly upland prairies south and east of Rockford and in the Sugar River sand area. (*P. oligosanthes* Schultes var. *scribnerianum* (Nash) Fern.)" (Fell 1955)

DISTICHILIS Rafinesque **Salt Grass, Alkaligrass** From Latin *distichus* from the Greek *distichos,* meaning two ranked, or with two rows, referring to the distichous leaf arrangement. A small genus of American grasses found along seashores and in alkaline regions, having creeping rhizomes, distichous leaves, and several-flowered spikes in small panicles. There are 6 to 10 (ca. 5) species primarily from warmer North America, but found in North, Central, and South America and Australia.

Distichilis stricta (Torr.) Rydb. INLAND SALTGRASS, aka Salt Grass, Spikegrass (*strictus* strict, upright, erect, tight, from Latin *strictus*, drawn tight, bound up)
Habitat: Wet, saline, and alkaline soils. Survives in coastal areas periodically flooded by seawater. Fine to moderately fine textured soils best. High salt tolerance. Basic to neutral soils. Adventive from the West.
Culture: In solid stands, plant 10 lb pls per acre in summer (Granite).
Description: Warm-season, strongly rhizomatous, sod-forming monoieous (?), short to medium tall,1-12" perennial.
Comments: C4. Moderate palatbility. Useful in unusually saline sites. 520,000 to 603,800 seeds per pound.

ECHINOCHLOA Palisot de Beauvois **Barn-yard Grass, Jungle-rice** New Latin, from *echinos,* a hedgehog, and Greek *chloe* grass, young verdure, from *chloos* light green color, from the prickly awns, related to Greek *chloros*, greenish yellow. 4-5 species of the tropics and warm-temperate regions. Used as cover crop in wetland restoration and as wildlife food. Attracts upland gamebirds, songbirds, and waterfowl. Our species are early successional annuals.

Echinochloa crusgalli (Linnaeus) Beauv. BARNYARD GRASS, aka Black Millet, Billion Dollar Grass, Jap Millet, Large Barnyard Grass (*crusgalli* a cock's or cockerel's spur)
Habitat: Seasonally inundated, wet meadows, common in agricultural and early successional wetlands. Open meadows, cultivated fields, and in waste areas around buildings. "A common barnyard grass." (Fell 1955) Tolerates most soils textures. Best in neutral soils.
Culture: Best used as a nurse crop at one (1) pound per acre in spring or dormant seeded. Anon. 1981 recommends 20-25 lbs per acre. Granite says 25-40 lb pls per acre alone in spring or summer. No treatment-light, plant (???) in late July or early August.
Description: general form Coarse annual with broad leaves culms 1.5-3.5' leaves rolled in the bud-shoot. sheaths compressed, keeled, glabrous, smooth, pale green, split auricles absent collar conspicuous, broad, glabrous, light yellowish green ligule absent blade 8 to 15 mm wide, 10 to 30 mm long, glabrous, pale or yellowish green, keeled, not ridged; margins smooth or scabrous.
Comments: Blooms 6,7,8,9. C4. Waterfowl, marshbirds, shorebirds, upland gamebirds, and songbirds eat seeds. Aquatic furbearers (esp. muskrats) eat foliage and plants. 114,286 to 155,000 seeds per pound. In northern Illinois usage, this is a diverse species complex that includes many other taxa often treated as species.

Var. **frumentacea** JAP MILLET (*frumentaceus -a -um* rich in flour, grain yielding, grain-like, pertaining to grain, as in *spiritus frumenti*)

Habitat: Best in wetland soils, but will grow in well-drained soils, pH 4.7 to 7.4.
Culture: Sow in spring or summer. Ernst says plant 20-30 lbs per acre as a crop, or 10 lb per acre as a companion crop. We recommend no more than 1 lb per acre, and many rightly prefer to eliminate this entirely from restoration seedings. Prairie Moon also recommends 1 pound per acre as a nurse crop.
Description: Warm season, cold tolerant, coarse, tall, annual bunchgrass. 1-5', with 4-8" seed head. Will grow in any soil, but adapted to wet, swampy sites. Excellent food and cover for wildlife. Favored by waterfowl, and can be flooded in the fall for waterfowl. Good for erosion control. Used as nurse crop or companion crop for establishing perennials. 225,000 seeds per pound.

ELYMUS Linnaeus 1753 **Couch Grass, Lime Grass, Wild Rye, Rye Grass** *Elymus* New Latin, from an old Greek name *Elumos*, or *elymos* millet, a type of grain, meaning generally "to roll up," referring to lemma and palea which are tightly rolled about the seed. Similar Greek *elym-o, elymo,* ελυμος, *elymos,* meaning case, quiver, millet; ελυμα, *elyma,* the share-beam of a plow. The Elymians, Ἔλυμοι, *Elymoi*, Latin *Elymi*, were an ancient tribe of western Sicily. *Elymus* (Ἔλυμος, *Elumos*), a natural son (or bastard son) of Anchises and brother of Eryx; one of the Trojans who fled from Troy to Sicily. With the aid of Aeneas they built the towns of Aegesta and Elymé. The Trojans who settled in that part of Sicily called themselves *Elymi,* after *Elymus.*

A genus of tall tufted perennial grasses, about 150 species, semicosmopolitan in temperate regions, comprising the lyme grasses, having closely flowered terminal flower spikes, and being sometimes used as fodder and to bind loose sandy soil. Widely used in restoration and reclamation work. No treatment is usually necessary. Cold moist stratify or fall plant may help some seed lots light, cool soils. Cool season grasses. "No pretreatment necessary. May be cold moist treated. Light to very light cover, very good germination. Benefits from light shade immediately after transplanting." (Dunham 1993) Wind pollinated. Attracts small mammals and songbirds. Easy from seed

Elymus canadensis Linnaeus CANADA WILD RYE, aka Canadian Wild Rye, Lyme Grass, Nodding Wild Rye, Prairie Wild Rye (of Canada or NE USA.)
Habitat: Unstable member of most native communities, hill, sand, dry and mesic prairies, bottomlands, roadsides and edges of woods, thickets, and open fields. Dry or moist soil, usually in full sun. Dry and mesic prairies. Adapted to moist or periodically moist well-drained soils. Natural meadows, along streambanks, and in damp open woods (Nowosad et al 1936). Prefers moist sites in areas of low precipitation, but will also grow in sandy soils. Best in coarse to moderately coarse soils. Prefers moderately well to poorly drained soils. Minimal flooding tolerance. Partial to full sun, shade tolerant. Moderate drought tolerance. Nutrient load tolerance low. Moderate salt tolerance, siltation tolerance low. Wide pH range.
Culture: Availability was a historical issue, but it has become increasingly available each year. No pre-treatment necessary other than cold, dry stratification (pm 09). Establishes easily from seed for quick cover. Good seedling vigor; easy in well-drained soils; some seed lots may benefit from 30 days cold stratification @ 35°. Some say germination best if drilled 1-1.5" deep (USDA 1997), but light cover works well. Anon. 1981 recommends 10-15 lb/acre in monocultures!!! Broadcast 1 lb pls per 2,000 ft. sq. or drill 10-12 pls lbs per acre in monocultures!!!! (Stocks). Granite seed recommends 7 lb pls per acre in monocultures. USDA (1997) recommends 0.2 to 2.0 pls lb per acre in mixes. We recommend 0.5 to 1 pls lb per acre rarely 2 pls lb per acre in mixes seeded into *in situ* soils with other native species. We may seed heavier in rebuilt urban soils or when there is little or no post-planting maintenance. A full stand will develop in 2-3 years, then rapidly gives way to warm season grasses. This is a short-lived species, and expensive in quantity. Why seed at 5-8# when it will be gone in a few years anyway?
Description: general form Tall, erect, cool-season, dark green or glaucous short-lived, perennial bunchgrass. roots some say this forms a loose sod, 16" minimum root depth culms 2.0-6.0' leaves blades are flat with a rough upper surface and fine toothed margins. Leaves are rolled in the bud-shoot. Green leaves almost all year long sheaths not compressed, not keeled, green or glaucous, sometimes pinkish at base, glabrous, smooth, split with edges overlapping, the innermost margin broadly hyaline, the outermost ciliate with hairs to 1.5 mm long. auricles present, narrow, 1.0 to 2.5 mm long, claw-like, clasping collar distinct, broad, continuous, glabrous, yellowish green, often oblique ligule coarse-membranous, greenish, 0.5 to 1.5 mm long, truncate, finely notched and short-ciliate blade 8 to 20 mm wide, 10 to 30 mm long, dark green, sometimes glaucous, flat, tapering, sharp-pointed, dull, prominently ridged and slightly scabrous on the upper surface, almost smooth on the under surface, the midrib forming a keel toward the base; margins scabrous spikes 6-8" long key features "*Elymus canadensis* generally has broader and smoother blades and longer ligule than *E. virginicus*. Both species have broader and coarser blades than *Agropyron cristatum*." (Nowosad etal 1936)

Good pioneer species. Good seedling vigor and good early spring growth, some shade tolerance.
Comments: Blooms 6-8. Landscaping (native nurse crop which soon gives way to climax grasses, also somewhat ornamental) Useful for erosion control, fibrous root system helps stabilize plantings. Easily established in disturbed areas. Useful in upper shoreline zone, streambanks, upland slope buffers, and vegetated swales. Provides habitat for small mammals, food and cover for wildlife. Successional. Good palatability but poor tolerance to grazing. Attractive dried seed heads, seed heads are nodding spikes, 6-8". 64,000 to 135,000 seeds per pound.

"A common wild rye growing along roads, fencerows, edges of woods, etc. Spike usually exserted and nodding. Hybridizes with bottlebrush grass." (Fell 1955)

Elymus riparius Weigand RIVERBANK WILD RYE, aka Streambank Wild Rye (*riparius -a -um* of river banks, from Latin *riparius*, frequenting banks of streams or rivers, riverside)
Habitat: Calcareous woodlands and wooded floodplains. Meadows, streambanks, and floodplains. Shade tolerant. Low drought tolerance. No salt tolerance. pH 4.5-7.1.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Genesis seed test data indicate no pretreatments are needed.
Description: 10" minimum root depth, 3-5' tall, green leaves almost all year long.
Comments: Blooms 7-8. Reclamation, conservation, and erosion control seedings. Provides food and cover for wildlife. May be found associated with *Elymus virginicus*. 46,400 to 96,514 seeds per pound.

Elymus villosus Muhlenberg ex Willdenow SILKY WILD RYE, aka Downy Wild Rye, Hairy Wild Rye (*villosus -a -um* Latin, with hairs, villous, soft-hairy, from *villōsus -a -um*, shaggy, hairy, rough, from *villus*)
Habitat: Mesic and dry savanna, occasional in seasonally wet habitats such as sandy floodplains. "forest species…bear(s) little relation to grasslands or oak openings." (Cochrane and Iltis 2000) Ernst says "streambanks, moist woods, and marshes." We have seen it on several, sandy-gravelly, well drained, but seasonally inundated floodplains on the Illinois River. Shade tolerant. Moderate drought tolerance.
Culture: : No pre-treatment necessary other than cold, dry stratification (pm 09). Genesis seed test data indicate cold moist treatment is required, perhaps 1 year in 10.
Description: Cool season bunch grass, 3-5', leaves blue green.
Comments: Blooms 7-8. Attractive dried seed heads, landscaping. Useful for erosion control on shady slopes. Said to preform well on low fertility sites. Provides food and cover for wildlife. 55,172 to 122,636 seeds per pound. "Awns long and spike long exserted. More slender than the other two species (*E. canadensis and E. virgnicus*). Found in woods and thickets. Common." (Fell 1955)

Elymus virginicus Linnaeus VIRGINIA WILD RYE, aka Lyme Grass, Terell Grass.
Habitat: Wet savannas-mesic woodland, tolerates moist to dry sites, sun to shade. Natural meadows, streambanks, thin open woods or open soil. Prefers moist soil. Can tolerate inundation up to 6" for modest periods, also tolerant of dry soils. Partial to full sun, shade tolerant. Moderate drought tolerance. Nutrient load tolerance moderate. No salt tolerance. Siltation tolerance moderate. pH 5.0-7.4.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Our test data indicate *E. virginicus* seed lots vary from non-dormant (zero %) to strongly benefiting from cold moist stratification (dormant exceeds germinable). Successful by fall or spring seeding. Broadcast 1 pls lb or drill 10-12 pls lbs per acre (Stocks). When used as a nurse crop, plant 1/2 to 2 pls lbs per acre (dl). In mixes plant 0.06 to 1.0 pls lb per acre (USDA 1997).
Description: general form Cool-season, tall, perennial bunch grass roots loosely tufted, 12" minimum root depth culms 1.5-3.5' up to 3', some strains up to 6' leaves rolled in the bud-shoot sheaths not compressed, not keeled, glabrous or rarely sparsely retrorse-hairy on the veins, smooth or sometimes slightly scabrous, green or the outer sheaths sometimes reddish at the base, split to the base, the edges overlapping, the margin of the outer one being scabrous, glabrous, or rarely sparsely ciliate, the margin of the inner hyaline, smooth and glabrous auricles present, 0.5 to 1.5 mm long, sharp and clawlike, or rounded collar broad, continuous glabrous, yellow-green, often oblique ligule thick-membranous, greenish, about 0.5 mm long, truncate, undulate, ciliolate blade 4 to 12 mm wide, 10 to 30 mm long, flat, tapering to a sharp point; upper surface dull and sometimes slightly glaucous, distinctly nerved with small and close ridges; lower surface bright green with the distinct midrib forming a keel; scabrous on both surfaces; margins scabrous heads beardless heads upright through maturity key features "may be distinguished from *E. canadensis* by having narrower blades, shorter ligule and more scabrous surfaces of blades. Both species of *Elymus* have broader and coarser blades than *Agropyron cristatum*." (Nowosad etal 1936)
Comments: Blooms 6-8. Dried seed heads, landscaping, wetland restoration and moist soil stabilization. Useful in upper shoreline zones, streambank stabilization, upland slope buffers, and vegetated swales. Can be planted alone, or in mixes in floodplain mix, pasture mix, or wildlife mix. Palatable and nutritious when grazed or hayed prior to heading. Can be aggressive if seeded too heavily. May be found associated with *Elymus riparius*. 67,200 to 117,252 seeds per pound. Virginia Wild Rye is a self-pollinating, inbreeding species. Genetic variation is not related to the distance between populations. Populations in widely seperated regions may be more genetically similar than populations within a smaller region. (Huff 2006) "A more or less glaucous wild rye that flowers early and is common in moist places as ditches and roadsides. Awns usually short and base of spike often included." (Fell 1955)

ERAGROSTIS Wolf 1776 **Lovegrass** *Eragrostis* New Latin, from Greek ἔρως, *eros,* ἔρωτος, *erotos*, sexual love and *agrostis***,** Old Greek *agros*, a field, or Greek *Agrostis*, grass, from *agrosteis*, grass, from Greek *agrostis*, αγρωστις, field grass eaten by mules, variously ascribed to *Triticum repens* and *Cynodon dactylon*. The exact meaning of the name is unclear, perhaps an allusion to splendor in the grass. A genus of about 350 species of grasses resembling the

bluegrasses but having flattened spikelets and deciduous lemmas, of temperate and topical areas. Love grasses are known to cause seasonal allergic reactions in certain individuals.

Eragrostis spectabilis (Pursh) Steudel PURPLE LOVE GRASS, aka Tumble Grass (From Latin *spectabilis, spectabil-*, notable, spectacle, that may be seen, worth seeing, notable, remarkable, showy)
Habitat: Sandy soils, often growing with *Leptoloma*. The seed heads of both species form tumbleweeds and they can be seen tangled together in a bush or fence row in early fall in sand country.
Culture: "No pretreatment necessary. May be cold moist treated. Light to very light cover. Good germination. Do not over water" (Dunham 1993). No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Dry storage only has worked well for us, cold moist stratify (45) or fall plant may benefit some lots. Seeds are very small, light cover. KNO3 is recommended by some.
Description/comments: 0.75-1.5' Blooms 6-9. Landscaping, rock gardens, bunching, non-competitive. 5,159,091 to 6,878,789 seeds per pound. This is one of two short grasses that lend a cast of pink-purple to sand hills and dry roadsides in late summer, the other being *Leptoloma cognatum*. "A conspicuous low growing tumble grass with a definately purple look. Common on high prairies and in sandy places. Perennial." (Fell 1955)

Eragrostis trichodes (Nuttall) A.W. Wood SAND LOVEGRASS, aka Tall Lovegrass (*trichodes* like or resembling hair, from Greek τριχο-, *tricho-,* τριχ-, *trich-,* combining form of θρίξ, *thrix,* hair, and ώδης, ὦδες, *odes, odes*, like, of the nature of.)
Habitat: Grows best in deep sandy sites, but may occur on heavier soils. Dry sand, prairies, and open woods (ecs). Full sun. High drought tolerance. Low salt tolerance. pH 5.0-7.8.
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Broadcast 1 lb pls per 15,000 sq. ft, or drill 1.5-2.0 pls lbs per acre. Small projects plant 0.5 lb pls per 1000sq, ft., or 6 pls lbs per acre (pots 2000).
Description: Perennial warm-season grass, tall, fine-leaved, leafy, attractive bunchgrass, dense deep, fibrous root system, 16" minimum root depth, culms 1-3', seed heads 6-12", open panicle with purple cast.
Comments: Blooms midsummer. Extremely palatable to livestock (*the ice cream of native grasses*), but not tolerant of continuous, close grazing. Breaks spring dormancy 2 weeks earlier than other warm season grasses. Can be planted in solid stand or in mixes. Good seedling vigor, establishes quickly. Tolerant of low fertility. Good for erosion control on sandy sites and range improvement. Provides cover for wildlife. Commercial varieties are available. 1,300,000 to1,626,000 seeds per pound.

FESTUCA Linnaeus **Fescue** *Festuca* New Latin, from Dodonaeus, classical Latin *festūca*, popular Latin *festūcum*, the name for a stalk of grain, stalk, stem, straw; rod for touching slaves in manumission; probably akin to Latin *ferula* giant fennel, or from Celtic *fest*, food or pasturage. A large genus (about 350 species, nearly cosmopolitan in temperate areas) of mostly tufted perennial grasses having flat leaves and panicled spikelets with acute pointed or awned flowering scales.

Fescue taxonomy is confusing due to the taxonomic classification of the scientist, and the classification used by the seedsmen and horticulturalists.

Festuca arundinacea Linnaeus TALL FESCUE, aka Reed fescue, Rye Grass [*F. elatior* of Swink and Wilhelm, 1994, *F. elatior arundinacea* of Gleason] Occasionally listed as *Lolium arundinaceum*.
Habitat: "An introduced perennal forage grass found in pastures and on roadsides." (Fell 1955) Good soil in meadows, and pastures, along roadsides, riverbanks, and in waste places. Occurs in all soil textures. Tolerates wet poorly drained sites. Tolerates low fertility, acid, and clay soils. Best growth in fertile soils, will tolerate moist bottomlands. Planted as turf and forage grass. Moderately coarse to fine soils. Moderate shade tolerant. Moderate drought tolerant. Moderate salt tolerance. Neutral or basic soils, somewhat acid tolerant. pH 5.9-9.0 (6.0-7.0 prefered for lawns)
Culture: 10 – 14 days until germination. For forage, drill 15 - 20 lb pls per acre (Stocks). For pasture Granite says 8 lb pls drilled per acre in spring. 30-100 lbs seeded alone (ecs). For new lawns seed 10 lbs per 1000, for overseeding existing lawns, use 6 lbs per 1000. Medium establishment rate.
Description: general form AGGRESSIVE AS HELL AND VERY INVASIVE! Densely-tufted, cool-season, moderately drought-tolerant, tall, perennial bunchgrass with deep (4-5') fibrous root system, which provides better heat and drought tolerance than other cool-season grasses. blade texture coarse. roots fibrous rooted, 12" minimum root depth culms 3-4' tall leaves coarse flat leaves, rolled in the bud-shoot sheaths not compressed, not keeled, glabrous, pale green, reddish to purple at base, split to very near the base with the hyaline margins overlapping auricles present, 0.5 to 1.5 mm long, soft, clawlike or blunt, yellow-green to creamy-white. collar broad, distinct, glabrous, yellow-green to cream colour; margins thin, dilated and often wavy ligule membranous, greenish, short (0.2 to 0.5 mm long), truncate to obtuse, entire blade 3 to 8 mm wide, 10 to 50 mm long, bright green; upper surface dull, scabrous and prominently ridged; lower surface glossy, smooth and slightly keeled; margins scabrous key features "This grass is

distinguished from *Lolium perenne* by rolled bud-leaves and from *Lolium multiflorum* by the rough leaf-margins and very short truncate ligule." (Nowosad etal 1936)
Comments: Blooms 5-6. Must use endophyte-free strains for forage. Some say good palatability for livestock and game. (yeah, right!, let me tell you about a bridge you might be interested in) Palatability best when plants are young, before leaves and stems become coarse. Not as well suited for forage as many cool-season grasses. A coarse grass, but good for places that need a tough stand of grass; withstands hard use. Considered a permanent seeding. Its general utility is poor. Fair for use in shade. Excellent for play areas. fair for golf fairways. Good for quick cover. Excellent for slopes and terraces. Used for pasture, erosion control, slope stabilization, mine reclamation, waterways, and for turf. Used for forage in central and southern areas of US. 205,000 to 230,000 seeds per pound. Many turf and forage varieties available. Tall fescue is known to chemically inhibit black walnut, sweet gum, white ash (Chick and Kielbaso, 1998).

TALL FESCUE IS THE MOST ECOLOGICALLY AND ECONOMICALLY DAMAGING GRASS IN EASTERN NORTH AMERICA. CONVERSION OF TALL FESCUE INTO NATIVE PLANTINGS, AND THE REINVASION OF NATIVE AREAS BY TALL FESCUE ARE MAJOR PROBLEMS! STILL THIS IS THE MOST COMMONLY PLANTED GRASS ON ILLINOIS ROADSIDES.

TURF-TYPE TALL FESCUE
Culture: Spring seeding preferred, but fall seeding will also work. Drill 10 lb pls per 1,000 ft. sq. (Stocks). 6-9 lb per 1000 sq. ft. (Lofts)
Description: Growth is slower and leaves are finer textured than forage type tall fescues. Popular choice for drought resistant cool-season lawn. Goes dormant in hot, dry weather, but not as quickly as bluegrass.
LAWN FESCUE
Culture: Spring or fall sowing, but can germinate in summer. Water to establish and irrigate during summer. Plant 5 pls lbs per 1000 sq. ft.
Description: Eurasian, slow growing, durable, fine textured, drought tolerant. Slow to establish. Developed for arid West. (pots 2000).

Festuca obtusa Biehler NODDING FESCUE
Habitat: Mesic and dry savannas, woodland, open bright shade to full shade. Moist to wet forests, woodlands, and disturbed areas. Neutral to acidic soils. "Common in damp places in woods as in Rock Cut Forest Preserve." (Fell 1955)
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant, light. Easy by division.
Description: 1.0-1.5. Graceful, vase-like form, clumping habit, glossy foliage.
Comments: Blooms 5,6. Landscaping, cool soils, 6-10" clumps. This species will tolerate rich soils, full sun for several years. May be short lived but reseeds, populations may wax and wane. Deer may not be interested in this plant. 320,000 to 454,910 seeds per pound. New name *F. subverticillata* (Persoon) E. B. Alexeev.

GLYCERIA R. Brown **Mannagrass** New Latin, from Greek *glykis, glykeros* sweet and New Latin *–ia*, referring to the edible seeds of one species, which were used in soups. A cosmopolitan genus of chiefly North American perennial paludal or aquatic grasses about 40 species, having lemmas very prominently 5 to 9-nerved.

Glyceria canadensis (Michaux) Trinius RATTLESNAKE GRASS, aka Rattlesnake Mannagrass (of Canada or NE USA.)
Habitat: Bogs, marshes, springy places, seepages, wet meadows. Marshes, swamps, and wet woods. Full sun. Low drought tolerance. No salt tolerance. pH 5.0-8.5.
Culture No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Genesis limited test data indicate cold moist stratification or fall planting is required.
Description: Cool season bunch grass, 16" minimum root depth, culms 2-3', purplish seed heads.
Comments: Blooms 6-8. Provides food and cover for waterfowl, muskrats, and deer. 1,159,647 to 1,184,000 seeds per pound.

Glyceria grandis S. Watson *In REED MANNA GRASS, aka American Manna Grass, Reed Meadow Grass, Tall Glyceria (*grandis* large or big)
Habitat: Seasonally inundated areas, drainage ditches. Shallow water and wet meadows (ecs). "Known to us only in Coon Creek slough south of the Rockton-Shirland Road." (Fell 1955)
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Genesis test data indicates some lots are non-dormant, but the most lots benefit from cold moist treatment. The very high seed count may give the perception of good germination in the greenhouse, but it can be improved.

Description: general form Native cool season,tall, erect, glabrous, perennial bunch grass culms 6.0-9.0' leaves folded in the bud-shoot sheaths compressed and keeled, glabrous, smooth or slightly scabrous, closed almost to the top but rupturing easily, pale yellowish green, with conspicuous cross-nerves connecting main veins auricles absent collar prominent, glabrous, pale green or yellowish brown, divided by the midrib ligule membranous, 2.0 to 5.0 mm long, truncate to acute, abruptly sharp acuminate, entire or slightly undulate blade 6 to 15 mm wide 10 to 40 mm long, V-shaped or flat with boat-shaped apex, glabrous, pale green, quite scabrous and faintly ridged on the upper surface, smooth or slightly scabrous on the keeled underside; transverse veins numerous and distinct forming a network with longitudinal veins; margins scabrous; the row of motor cells on each side of midrib showing as two light lines by transmitted light key features "This grass is distinctly yellowish green in colour and the leaves are firm, erect and not conspicuously ridged. The cross-nerves joining the veins, interrupting the air-filled lacunae, are distinct in both sheaths and blades of this species." (Nowosad etal 1936).
Comments: Blooms 6-8 Wetland restoration, provides food and cover for waterfowl, muskrats, and deer. 1,269,930 to 1,333,333 seeds per pound. This species performed well in some shoreline plantings at Skokie Lagoons, where we learned it is more good basin, bad basin, not good species, bad species. It is not a grass for the meek and timid. We have waded crotch deep in drainage ditches picking seed and the culms of this species were still over our heads.

Glyceria striata (Lam.) A.S. Hitchcock FOWL MANNA GRASS, aka Fowl Meadow-Grass, Nerved Manna-grass (*striatus -a -um* striated, striped)
Habitat: Moist meadows, pastures, and ditches. Wet meadows-wet savannas-wet woodlands-mesic woodland-upland swamp; Prefers moist to saturated areas. Full shade to partial sun. Anaerobic tolerance high. CaCO3 tolerance medium. Low drought tolerance. Nutrient load tolerance low to medium. Salt tolerance low to none. Siltation tolerance moderate. pH 4.0-8.0.
Culture: Good establishment from seed. Needs light to germinate, little or no cover. "No treatment cold moist treatment, or fall sow. Will germinate with no treatment. Light cover. Very good germination" (Dunham 1993). No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Genesis seed test data shows an occasional lot with zero dormancy, but most lots require cold moist stratification or fall plant for natural stratification. Some say store in cold water for 3 months (USDA 1997). Seed readily available, but not northern Illinois or usually not midwestern ecotype. A fine seed, it may be mixed with sand for more even distribution of seed, especially if you wanna rupture a disk or develop a hernia. In seed mixes plant 0.06 - 0.50 pls lb per acre (USDA 1997). They (USDA) are a bit high, use 0.031 up to 0.125 lb per acre. This seed should be spread on top of the ground. Transplants best planted in spring.
Description: general form Native, cool season bunch grass with erect leafy shoots from short rootstocks roots spreading by short rhizomes culms 1.5-4.0', but up to 5.7' in some parts of its range leaves folded in the bud shoot sheaths flattened or elliptical but not prominently keeled, slightly scabrous pale green to purple or at least tinged with purple, prominently cross-nerved, closed almost to the summit but splitting easily due to its membranous nature auricles absent, collar not conspicuous, glabrous, pale, divided by midrib ligule thin-membranous, 2 to 4 mm long, acute, entire blade 2.5 to 5 mm wide, 5 to 25 mm long, flat or V-shaped, abruptly acute and boat-shaped at tip, glabrous, faintly ridged, pale green, not glossy, with the two median lines conspicuous; the younger blades remain folded for some time and arise at a sharp angle from the shoot; margins scabrous, especially towards the apex heads green flowers key features "This species is distinguished from *G. grandis* by its narrower leaves, its purple-tinted sheaths, absence of conspicuous cross-nerves in the blades and its lower soil moisture requirement." (Nowosad etal 1936)
Comments: Blooms 5-6. C3. Landscaping, wetland restoration, uppershoreline zone, stream bank stabalization, and vegetated swales Provides food for waterfowl, esp. ducks, and food for muskrats and deer. 1,343,195 to 2,560,000 seeds per pound. "Common in wet woods where it is weak and semi-decumbent and the flowers are small and green. Also common in wet open areas where it is upright, grows larger, the flowers are larger and they are purple. This and *G. grandis* are our most beautiful grasses." (Fell 1955)

HIEROCHLOË R. Brown **Holy Grass, Sweet Grass, Vanilla Grass** holy grass from Greek, ἱερός, *hieros,* sacred, holy, and and χλόη, *chloë*, young grass or a young green shoot, similar to Greek *chloos,* light green, referring to the strewing of *H. odorata* before the doors of churches on festival days. The common name is from the distinctive sweet smell. The fragrance is due to the high coumarin content in the leaves. 30 species of temperate and cold regions. Five species in northern North America. C3.

Hierochloë odorata (Linnaeus) Beauv. SWEETGRASS, aka Vanilla Grass, aka Buffalo Grass, Holy Grass, Vanilla Sweet Grass, *Feur Moire* (Gaelic), and *Zebrovka* ("the place where bison graze") (*odoratus -a -us* scented, odorous, fragrant.)
Habitat: Wet meadows, fens, wet savannas, meadows, swales, and shores. Moist calcareous soils. Extremely cold hardy. It is concentrated on abandoned habitation sites on Walpole Island reserve in Ontario. Sweet Grass may persist in seasonally moist road ditches. distribution Circumpolar, occasional in northern 1/5 of Illinois.

Culture: No treatment, can fall plant. USDA Plant Guide says cold moist stratification is required. "No pretreatment considered necessary. May cold moist treat. Light cover. Fair germination, but once established, spreads by rhizomes" (Dunham 1993). 30 days cold moist stratification (pm 09).

Sweetgrass may not set seed every year, with much of the seed seems light and may be infertile. Seed availability is limited to packets if available at all. Most seed is used by nurseries "in house" for plant production. Division can be tedious may be easiest.

Description: general form Perennial native grass, cool season roots spreads rapidly by slender rhizomes; rhizomes and roots forming dense mat beneath the soil surface culms 1.5-2.0', but generally shorter leaves fragrant heads open pyramidal panicle 1 3/4"-4 3⁄4" long, with slender branches spikes three-flowered, often apomictic or infertile N 2N = 28, 42, 56.

Comments: One of the earliest grasses of the year to flower and set seed, blooming in mid-April. C3. Ethnobotanical uses, landscaping, fragrant, aggressive, calcareous. 640,000 to 826,000 seeds per pound. Probably much more common then we think. It is a very beautiful grass when flowering. After the seeds stalks are gone, it is unremarkable except for the fragrance. Although it may be aggressively rhizomatous in a garden, Sweetgrass will not compete with introduced cool season grasses.

A conspicuous early grass which is rather common on low prairies and even in damp places along roadsides. Also kown in DeKalb, Boone, Ogle and Stephenson counties." (Fell 1955)

HORDEUM Linnaeus 1753 **Barley** New Latin from Latin name for *H. vulgare* Barley. The common name is from old English *bærlíc*, which originally meant *hordeāceus*, related to or of the nature of barley, from *hordeum.*

Hordeum jubatum Linnaeus FOXTAIL BARLEY, aka Squirrel Tail, Squirrel-tail Barley, Squirrel-Tail Grass, Wild Barley (*jubatus -a -um* maned, crested, a loose and much branched tuft or panicle from *juba*, a mane, typically in reference to an inflorescence.)

Habitat: Typical on saline roadsides and farmed wetlands on moderately moist silty or sandy loam soils. Salt tolerant.

Culture: No treatment. Further germination pretreatments not sure? (Prairie Moon) Genesis limited seed test data indicates has little or no dormancy.

Description: general form WEED. Annual or biennial or perennial grass. USDA and Ilpin say it is perennial roots inconspicuous rhizomes culms 0.8-2.0' leaves rolled in the bud-shoot, fine leaved sheaths not compressed, not keeled, pale green or pink-tinted at base, glaucous, glabrous, the lower generally pubescent auricles absent or reduced. collar broad, glabrous, pale green, continuous ligule membranous, 0.5 to 1 mm long, obtuse to truncate ciliate blade 2 to 6 mm wide, 5 to 12 mm long, erect, tapering gradually to a sharp point, glabrous, light bluish green; upper surface pubescent and prominently ridged; margins slightly scabrous key features "Species is densely tufted. It has long-awned spikelets which make this "one of the most attractive grasses in Illinois. Young inflorescences sometimes are a beautiful rose-purple." (ilpin)

Comments: Blooms 5-9. C3. Bunching, successional. Badly used as temporary ''matrix'' in some native seed mixes, to the extent that the nurse crop may cost more than the permanent seeding. The pollen is allergenic. 151,200 to 266,342 seeds per pound. "A tufted perennial which flowers in June. It is common on roadsides and in fields." (Fell 1955)

Hordeum vulgare Linnaeus BARLEY, aka Common or Grain Barley (*vulgaris -is -e* common, vulgar, from Latin *vulgāris*, from *vulgus*, the common people.)

Habitat: Moderately coarse to fine soils. Best in neutral soils, base tolerant, somewhat acid tolerant.

Culture: Planted alone, drill 60-100 lb per acre in fall or spring, according to variety. 75-80 lb in spring or fall (Star 2002). 90 lb per acre as a grain crop, 30 lb per acre as a nurse crop with native perennials (Ernst Vol 34)

Description: Cool-season, moderately drought tolerant, medium tall to tall annual grass.

Comments: C3. Adapted to wide variety of sites. More productive cover drop on saline or alkaline sites. Easily out competed by establishing perennials. Spring and winter varieties available. More hardy than winter oats, but less hardy than winter wheat. 12,500 seeds per pound. Many commercial varieties available, but not a popular agricultural crop in Illinois.

Victor Schaff, S&S Seeds, Carpenteria, CA, says Barley is one of the best nurse crops, especially a short-strawed variety (personal communication). Historically, very little Barley has been grown in northern Illinois in recent years, making the seed somewhat hard to purchase, but some vendors seasonally keep a limited amount in stock.

HYSTRIX Moench **Bottle Brush** New Latin, from Latin, porcupine, from Greek. As well as a grass, it is a genus of terrestrial porcupines that is the type of the family *Hystricidea*.

Hystrix patula Moench. BOTTLEBRUSH GRASS (*patulus -a -um* spreading from Latin *patulus*, adjective, wide open, gaping, wide-spreading) upl

Habitat: Mesic savannas and deciduous woods, woodland openings and borders, adjacent to woodland paths, meadows near woods, and rocky glades. "Frequently seen but seldom abundant. It grows in thickets and at the edge of woods." (Fell 1955)

Culture: No treatment. "No pretreatment necessary. May cold moist treat. Light to very light cover. Very good germination" (Dunham 1993). No pre-treatment necessary other than cold, dry stratification (pm 09).
Description: Cool season, bunching, culms 1.5-3.0', green leaves almost all year long, spikes up to 4" long.
Comments: Blooms 6-7. Dried seed heads, ornamental bottle-brush seed heads, landscaping, used for soil stabilization. Provides food and cover for wildlife. 59,259 to 121,600 seeds per pound.

KOELERIA Pers. **June Grass** Georg Ludwig *Koeler,* 1765-1807, of Mainz, a German physician, pharmacist, botany professor, author and student of the grasses. A cosmopolitan genus of about 35 species of dry grasslands and rocky soils. x = 7

Koeleria macrantha (Ledeb.) J. A. Schultes *KY, LA, OH, PA JUNE GRASS, aka Crested Hairgrass, Mountain Junegrass, Prairie June Grass (*macranthus -a -um* large-flowered, or with large flowers.)
Habitat: Dry, hill, and sand prairies, sand savannas, sandy soil. Moderate to well-drained soils. Coarse, moderately coarse to medium soils. Anaerobic tolerance none. CaCO3 tolerance high. Drought tolerance high. Fertility requirement medium. Salinity tolerance none. Shade tolerant. Neutral to basic soils. pH 6.0-8.0, or 6.5-8.0 distribution June Grass has a very broad distribution, western North America south to Mexico, and widely distributed in temperate Eurasia, especially western Mongolia.
Culture: No treatment, cool soils, and light. (Butler & Frieswyk 2001, Wick et al 2004, Young 2001) Some lots from parts of its range may exhibit physiological dormancy and may benefit from cold moist stratification. (Winslow 2002) Our seed test data show northern Illinois genetic material will benefit from cold moist stratification. "No pretreatment, or cold moist treatment. Prefers cooler soils: Sow early spring or late fall. Easy from transplants or dry stratified seed. Light cover. Variable: good to poor germination" (Dunham 1993). No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. (pm 09) Anon 1981 recommends 8-12 lbs per acre (if you have an unlimited budget!). Establishes easily. Granite recommends 1-2 lb pls per acre in fall.

Seedlings are not vigorous, are slow to establish, and are subject to damage from wheel and foot traffic. Late spring burns are damaging to Junegrass.
Description: general form Perennial native grass, cool season drought-tolerant, short-lived medium tall, bunch grass roots 20" minimum root depth culms 0.5-2.0' leaves basal, flat to inrolled, sharply pointed heads narrow contracted panicles having the appearance of dense spikes, one per stem spikes pale green to purplish N 2n = 14, 28 key features Though not a problem in the Midwest, June grass can be mistaken for *Poa fendleriana* muttongrass and *Trisetum wolfii,* spike trisetum, but is distinguished by the hairy panicles and smaller spikelets. It differs from the similar *Sphenopholis intermedia,* with less open panicles, and spikelets that disarticulate above the glumes.
Comments: Blooms 5-7. Seed is generally harvested around Father's Day. Dried seed heads, landscaping. June grass is cold, heat, and drought tolerant, medium-lived, but can be very short lived in average to good soils. Sharp drainage is imperative. Good for severely disturbed, sandy or gravelly sites with internal, sharp drainage. Dried seed heads used in fall arrangements. Blooming June Grass is a great contrast to Spiderwort in flower. 2,562,903 to 5,710,692; 6,400,000 (hulled) seeds per pound. Seed is a grain. Wind pollinated, but said to be, in part apomictic. Some populations or ecotypes may produce low viability seed.

This is the "original" cool season prairie grass. It was for years abused and is still badly abused, by being included in mesic mixes or general prairie mixes because it is cool season and because it is ***short*** and because we have another generation of maroons writing jobs and gullible LA's believing that the maroons who write seed mixes are smart. It does not matter if June Grass does not live and we waste a lot of money and time. June Grass needs the sharp, internal drainage of kames and dunes, and little to modest competition. An "improved" variety is near release.

"An early flowering bunch grass that is most abundant in the sand areas but is also found on the prairies about Camp Grant. (K. gracilis Pers.)" (Fell 1955)
Associates: Resumes growth in very early spring, excellent early season forage for livestock and wildlife, good summer forage. It is a key winter forage in parts of North America. Palatable and good forage where the deer and the antelope play (and elk). Attracts game birds, songbirds, and small mammals. Provides a degree of cover for small mammals and birds.

June Grass is generally considered nonmycorrhizal and is easily out competed by endomycorrhizal C4 grasses. Don't waste seed with improper mix designs. The presence of mycorrhizae may have neutral or positive effects on seedling emergence (Hartnett et al 1994, Wilson & Hartnett 1997).

Two species are native to northern North America, *Koeleria asiatica* Domin, Eurasian Junegrass, and *Koeleria macrantha* (Ledeb.) Schult., Junegrass. *Koeleria asiatica*, 2n = 28, grows from the Urals east to northern Alaska and northwestern Canada. *K. macrantha*, 2n = 14, 28 grows in temperate North America and Eurasia, and is a polymorphic polypoid complex. Some separate the North American plants as *K. nitida* Nutt. *K. pyramidata* (Lam.) P. Beauv., Crested Hairgrass, 2n = 14, is European.

LEERSIA Swartz 1788 **Cutgrass** *Leersia* New Latin, from Johann Daniel *Leers* 1727-1774 German botanist and pharmacist and New Latin *–ia***.** About 18 species of tropical and warm temperate areas. x = 12 or x = 6.

Leersia oryzoides (Linnaeus) Swartz RICE CUT GRASS, aka Cut Grass, *Léersie Faux-Riz*, Ricecut Grass, Sickle Grass (*oryzoides* like or resembling Rice)
Habitat: Seasonally inundated areas, shorelines, wet meadows, borders of sloughs, spring-fed rivulets, open swales, calcareous springy places. Upland swamp, prefers open sunny, moist to saturated soils. In most agricultural wetland soil seedbanks. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Nutrient load tolerance moderate to high, salt tolerance none or low, siltation tolerance moderate. Partial to full sun. Shade intolerant. pH 6.0-7.0 in one source, or pH 5.1-8.8. Some ecotypes may tolerate pH as low as 3.0.
Culture: The recommended cultural requirements in the literature vary from no treatment to fall seeding, to cold moist stratification, to cold water stratification. Prairie Moon (2007, 2008) recommends cold dry stratification. No pre-treatment necessary other than cold, dry stratification (pm 09). We have had fair to terrible results with green house sowing after cold dry storage, so cold moist stratify, early and often. Seed possesses physiological dormancy requiring 180-270 days cold moist stratification (USDA). Low rate of success from field planting. Some seed lots may be of low viability. In mixes plant 0.031-0.125 pls lb per acre.

Scarification of the seed coat after hulling helps in greenhouse production. Hulled Leersia seed treated with GA3 germinated in several days in the greenhouse (GNI greenhouse, 2006). There may be germination inhibitors in the husks.

Bare root plants and plugs should be installed at same depth they have at which they been growing and on 1-3" centers in spring, to fill in in 1-3 years respectively. Young plants do not tolerate submergence for more than 2-3 days. Mature plants tolerate seasonal to long term flooding, up to 8". Mature stands are somewhat tolerant of fluctuating water levels. Seeds, bare root plants, and plugs becoming readily available. Seed, bare root plants, and plugs need to be planted in moist soil, not standing water. Plants need to be 6" tall before water levels rise, preferably 18".
Description: general form Perennial wetland grass roots rhizomatous, 14" minimum root depth culms 1.0-4.0' , erect or sprawling heads greenish white flowers spikes Chasmogamous and cleistogamous spikelets N 2n = 48 key features "Versus *L. lenticularis*, this species' lemmas are papillose all over, as well as ciliate on the keel. Spikelets are oblong, and not round." (ilpin)
Comments: Blooms 7-9. C3. Used as a wetland cover crop, useful in upper shoreline zones, stream bank stabilization, vegetated swales. Good sediment stabilization capacity. Caution sharp leaves!!!. Walking through a stand of Rice Cut Grass in summer in shorts makes your legs look like you had a fight with a bagful of cats and lost. The leaves cut flesh and the stems abrade the skin. One of the first wetland plants to establish. Once established, may become aggressive. 336,296 to 698,461 seeds per pound. "Common in wet places as in ditches and along streams." (Fell 1955)
Associates: Wind pollinated. Seeds and roots are eaten by waterfowl, rails, herons, and muskrats. Birds eat seeds, including Swamp Sparrow, Tree Sparrow, Sora Rail, Canada Goose, and various ducks. Stands of rice cut grass provide cover for reptiles, amphibians, insects, crustaceans, and fish. Larval host for *Ancyloxypha numitor,* Least Skipper and *Polites peckius*, Peck's Skipper.

Leersia virginica Willdenow WHITE GRASS, aka White Cutgrass (of or from Virginia)
Habitat: Wooded floodplains, shaded woodland paths, depressions in morainal (more anal) woodlands. Wooded, morainic depressions. "Frequent in damp woods as west of Roscoe, Kishwaukee Forest Preserve, etc." (Fell 1955)
Culture: ?
Description: 2n = 48. "Panicle is sparsely branched, the branches with many (approx. 10+) spikelets. Lemma is sparsely pilose throughout; glabrous to ciliate on the keel and margins." (ilpin)
Comments: Blooms 7-9. Extremely limited availability only, one or two vendors nation-wide, with wildly irregular crops, and just not out there most years. Do not specify this in a seed mix unless you like lookin like a dufus, or do you need reminded of professional ethics? Knowingly specifying seed that does not exist raises some questions.

LOLIUM Linnaeus **Rye-grass, Darnel, Fescue** New Latin, from Latin, for darnel, a weedy annual grass (*Lolium temulentum*, Bearded Darnel, Poison Rye Grass, Tares) with very long awns on the glumes and seeds sometimes considered poisonous that often occurs in grainfields and other cultivated land. Lolium seeds are poisonous. Seen as Ray-grass.

Lolium multiflorum Lamarck ANNUAL RYEGRASS, aka Italian Ryegrass (*multiflorus,* many-flowered, with many flowers)
Habitat: Seeded in meadow, pasture, and erosion control mixes, but seldom persisting for more than one season. Introduced from Europe. Moderately coarse to moderately fine soils. Best adapted to mild winters and cool summers. Tolerates some shade, some traffic, and wide range of soils. Loose fertile to semi-fertile soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance high. Shade

tolerance intermediate. Neutral, somewhat acid and basic tolerant. pH 5.0-7.9. Tolerances vary with varieties.
Culture: Establishes quickly and easily. 10 to 14 days to germination. For pasture plant 25-35 lb pls per acre in spring (Granite). 50 lbs seeded alone, or 5-10 lbs as a companion crop (ecs). For a new lawn seed 10 lbs per 1000, for overseeding an established lawn seed 6 lbs per 1000. Rapid growth rate.

For nurse crops use 4-5 lbs spring and 5-10 lbs fall. More seed will compromise the permanent seeding. If this much seed will not hold the soil, use a straw blanket. Some rightly feel this species is totally inappropriate as a nurse crop.
Description: general form Glabrous, tufted, short-lived perennial, similar to *L. perenne* and *Festuca elatior* in appearrance roots 8" minimum root depth culms 1-4' tall leaves rolled in the bud-shoot sheaths not compressed, not keeled, glabrous, green, pinkish at base, split; margins hyaline and overlapping auricles present, 1-3 mm long, soft, flat and pointed or sometimes blunt or clawlike collar broad, distinct, continuous, glabrous, pale to yellowish green; margins thin and dilated ligule membranous, 0.5-2.0 mm long, obtuse, entire blade 4-7 mm wide, 10-40 mm long, soft, bright green; upper surface dull, prominently ridged; lower surface smooth, glossy and slightly keeled; margins smooth at base, blade texture is coarse key features "This species is distinguished from *L. perenne* by its rolled bud-leaves, and from *Festuca elatior* by its smooth leaf-margins, narrower auricles and longer ligule." (Nowosad etal 1936)
Comments: Blooms May to June. Quick erosion control. Nurse or companion crop to protect native seedings. May reseed itself. The usual life is 1 year. 217,000 to 230,000 seeds per pound. Annual Rye hybridizes with Perennial Rye. Taxonomically, Annual Rye is included by some in Perennial Rye. General utility is poor. Poor in shade. Good for play areas. Fair for golf fairways. Excellent for quick cover. Fair for slopes and terraces

Lolium perenne Linnaeus ssp. ***perenne*** PERENNIAL RYEGRASS, aka Common Darnel, English Rye-grass
(*perennis -is -e* perennial, from Latin *perennis*, remaining or lasting throughout the year)
Habitat: Almost exclusively in periodically reseeded meadows and pastures. Medium coarse to medium fine soils. Medium fertility, acid, clay and loamy soil. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement high. Salinity tolerance low. Shade intolerant. Neutral, somewhat acid and basic tolerant. pH 5.2-7.5 (pH 6.0-7.0 prefered for lawns). Tolerances vary with varieties.
Culture: Establishes quickly and easily. 10 to 14 days to germination. For pasture plant 25-35 lb pls per acre in fall (Granite). For a new lawn seed 10 lbs per 1000, for overseeding an established lawn, seed 6 lbs per 1000. Sow in late spring for summer cover crop. Cover crop 1 lb per 1000 sq. ft. (pots 2000). Seed 50 lb per acre alone (ecs). Rapid growth rate.
Description: general form Cool-season, short-lived, medium to tall, perennial, entirely glabrous, bunch grass roots fibrous-rooted, 10" minimum root depth culms 1-2' leaves folded in the bud shoot sheaths usually compressed but sometimes almost cylindrical, not keeled, glabrous, pale green, reddish at base, closed or split auricles small, soft, clawlike, collar narrow, distinct, glabrous, yellowish to whitish green ligule thin-membranous, 0.5-2.0 mm long, obtuse, toothed near the apex blade 2 - 6 mm wide, 5 - 15 mm long, sharply taper-pointed, keeled, prominently ridged on upper surface, smooth and glossy on lower surface, bright green; margins slightly scabrous, the blade texture is coarse key features Closely resembles *L. multiflorum* and *Festuca elatior*, from which it is distinguished by the folded leaves in the bud-shoot.
Comments: Blooms 6-7. Adaptable grass. Needs adequate moisture. Usual life is three years. Excellent palatability, used for pasture and range improvement blends. Extensively bred for turf grass. Fine textured and deep green, it is a fast growing seed used in mixtures and in monocultures. General utility is poor. Poor in shade. Good for play areas. Fair for golf fairways. Excellent for quick cover. Good for slopes and terraces. Good quick cover and nurse grass (for other turf grasses). Perennial rye does not do well in extreme cold or drought conditions. 201,000 to 240,400 seeds per pound. Known to chemically inhibit apple, forsythia, flowering dogwood. (Chick and Kielbaso, 1998)

"An introduced perennial rye grass that is used in lawns and pastures and commonly escapes and persists." (Fell 1955)

MUHLENBERGIA Schreber 1789 **Muhly** New Latin, from Gotthilf Heinrich E. *Mühlenberg* (1753-1815) American clergyman, born in Trappe, Pennsylvania and educated in Halle Germany, who studied botany and other natural sciences in his spare time, and New Latin *–ia.* The accepted spelling for *Carex muehlenbergii,* named for the same individual, has changed. A large and diverse genus of about 160 grass species of North America south to Andean South America, also eastern and southern Asia. The species groups seem very different.

"The species of *Muhlenbergia* are of little economic importance. It is said that the species which inhabit damp ground are useful for hay if cut before the stems become hard, but most species grow in waste places and are looked upon as weeds. The long rootstocks make them somewhat difficult to destroy; thoro cultivation is the only method of eradication recommended. *M. mexicana*, *foliosa*, and *racemosa* are the only species likely to cause trouble in this state." (Mosher 1918)

Muhlenbergia cuspidata PRAIRIE SATIN GRASS
No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)

Muhlenbergia glomerata (Willdenow) Trin. MARSH WILD TIMOTHY, aka Marsh Muhly, Spiked Muhly (*glomeratus -a -um* glomerate, clustered in a head, club-shaped, from Latin *glomero, glomare* to form into a sphere, or a rounded heap.)
Fens, perennial. No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Blooms 7-9.

"A tall, slender, erect grass answering the Gray's Manual description of this was found in sand at the edge of a boggy place in Rockton Township."(Fell 1955)

Muhlenbergia mexicana (Linnaeus) Trinius LEAFY SATIN GRASS, Meadow Muhlenbergia, Mexican Drop-Seed, Satin Grass, Hairy Wirestem Muhly, Wire Stem-Muhly (*mexicanus -a -um* of Mexican origin, of or from Mexico.)
Habitat: Fens, wet savanna, mesic woodland. Common in fields, gardens, and waste places.
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratification or fall planting is good insurance. Hulled seed germinated very well with no treatment (gni2002), but our 2007 crop had an absolute requirement for cold moist stratification. The dormancy characteristics are variable.
Description: Culms 2-4' long, often branched at the base, rooting at the lower nodes.
Comments: Blooms 8-9 Wetland restoration. Aggressive, abundantly self sows in open, moist ground! Plant only in the back 40, or by that nasty neighbor. In spite of the specific epithet, this grass grows in the United States and southern Canada. 4,146,119 to 5,503,030 seeds per pound. "Locally abundant in wet places and on prairies and roadsides."(Fell 1955)

Muhlenbergia racemosa (Michaux) BSP. UPLAND WILD TIMOTHY, aka Wild Timothy (*racemosus -a -um* with flowers in racemes, for the elongated inflorescence. New Latin from *racemus*, the stalk or a cluster of a bunch of grapes, and *–osus,* plenitude or notable development, with a raceme, a cluster of flowers each on their own stalk and arranged along a single central stem.)
Habitat: Disturbed dry prairies.
Culture No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) No treatment / fall plant.
Comments: 1.0-2.5', Blooms 8,9, adventive. 4,536,000 seeds per pound.

"Frequently abundant in wet places forming dense patches but also common on dry prairies." (Fell 1955)

PANICUM Linnaus 1753 **Panicum** New Latin from Latin *panicum*, the Latin name for millet, from *panus* ear of millet, tuft, swelling, inflammation, akin to Latin *pantic-, pantex* paunch; alternately from Latin *panis*, bread. Wind pollinated. x = 9, usually, sometimes 10. Apomixis, polyploidy, dysploidy, and autogamy have produced intergrading forms and microspecies.

Propagation for *P. liebergii* and *P. oligosanthes*, seed is often sown fresh or with no pre-treatment. "In my experience, cold only treatment is successful. Light to very light cover. Very good germination" (Dunham 1993). Fruit is a small grain. *Panicum* is a very large genus, mostly perennials, primarily of warm climates. Mosher (1918) listed 36 species in Illinois. The inflorescence is usually a many-flowered panicle. Spikelets have two glumes and a sterile lemma, which are usually strongly unnerved, and a very hard, shiny, fertile lemma and palea enclosing the fruit, which are never nerved (Mosher 1918).

Panicum dichotomiflorum Michaux FALL PANICUM, aka Knee Grass, Smooth Panic Grass, Sprouting Crab Grass, *Panic d'Automne*
Habitat: Moist soil, open disturbed woods, early successional wetlands. Low waste areas, ditches, open alluvial soils. Ag fields. Anaerobic tolerance high. CaCO3 tolerance high. No drought tolerance. Fertility requirement low. Salinity tolerance medium. Shade intolerant. pH 4.8-7.0.
Culture: The seed has a significant dormant faction and should be fall planted. Rapid growth rate. Medium seedling vigor.
Description: general form Annual bunch grass, entire plant smooth and glabrous roots 6" mimimum root depth culms 1-4 feet, somewhat flattened, usually spreading at the base, but sometimes erect, geniculate at the nodes, the nodes often considerably swollen leaves blades 4 to 20 inches long, 3 to 20 mm wide sheaths loose, very often purplish spikes spikelets smooth, 2-3 mm long, usually 2.5 mm flowers 3-merous N 2n=36, 54 key features "with annual habit and extremely short (1/5-1/4 l of spikelet) first glume. Var. *dichotomiflorum* is separated from other 2 varieties by 1) its larger spikelets (2.4-3.5 mml) and mostly upright culms with upper panicles long-exerted from the sheaths. This variety is similar to var. geniculatum." (ilpin)
Comments: Blooms summer. C4. Used as a cover crop in wetland restoration. Many species of wildlife use the seeds and plants for food and cover, including ducks, geese, wild turkey, wasckully wabbits, muskrats, and deer. This is an agricultural weed of economic impact, and is considered invasive in most of the USA. Leaves might cause photosensitization in livestock. 392,000 to 641,243 seeds per pound.

"This species is usually found in moist ground along ditches and streams, and generally produces a very rank growth. It also occurs as a weed in waste places and cultivated soil, often forming a rank growth after crops have been removed. In such situations it must be regarded as a weed, but is not usually very troublesome as it is an annual and can be easily controlled if thoro cultivation is given the soil and no seed is allowed to form." (Mosher 1918)

"A very common late flowering annual found in fields, waste places, and on roadsides. Our common form is variety *geniculatum* (Wood) Fern." (Fell 1955)

A USDA website says this is an annual grass that is tolerant of -43ºF. Evidently a saber-toothed Pleistocene super annual grass.

Panicum virgatum Linnaeus SWITCH GRASS, aka *Panic Raide*, Prairie Switchgrass (*virgatus -a -um* wandlike, or twiggy, striped, from Latin *virgatus -a -um*, made of twigs, or striped.)
Habitat: Grows in all types of prairie, dry to mesic prairie, roadsides and fields, open woods, dunes, shores, in brackish marshes, rocky stream beds. Wide variety of sites where moisture is adequate. Said to prefer lower moist sites, but will also grow on dry sand. Best on moderately coarse to moderately fine soils. Shade intolerant. Neutral to basic soils, somewhat acid tolerant. pH 4.5-7.5. distribution 45 of the 48 lower states.
Culture: No treatment, easy from dry stratified seed, fall planting "No pretreatment necessary. may be cold moist treat. Light cover. Excellent germination. Self sows" (Dunham 1993) No pre-treatment necessary other than cold, dry stratification (pm 09). Drill 3 to 5 pls lbs 1/2 to 3/4" deep in spring. Broadcast 1 lb pls per 4,200 sq ft, or drill 5 pls lbs per acre (Stocks). Granite recommends 5-8 lb pls per acre in summer for pasture. Ernst says 8 pls pounds per acre seeded alone.
Description: general form Vigorous warm season, strongly rhizomatous, open sod-forming tall grass, leafy roots 12" minimum root depth culms from long creeping rootstocks, not flattened, to 2.0-6.0' leaves blades somewhat barbed on margins, with a V-shaped patch of hairs from collar on topside of leaf (ligule) sheaths rounded, reddish to purple at the base spikes panicles open, the spikelets long pedicled N 2n = 18, 21, 25, 30. 32, 35, 36, 54-60, 67-72, 74, 77, 90, 108. key features: "Mostly tufted perennial from scaly rhizomes. One of the most robust panicums of Illinois. Perennial with long-pedicelled (sic) spikelets and diffuse habit. Only member of Sect. *Virgata* in Illinois." (ilpin)
Comments: Blooms 7-9. C4. Attractive dried seed heads. Individual plants increase in clump size through short rhizomes. Some cultivars are aggressive, most cultivars are chosen by aggressiveness from seed. Produces abundant summer forage highly palatable and nutritious to livestock and wildlife. Winter hardy and drought resistant. Useful in erosion control, soil conservation, land reclamation, pasture, hay, and range improvement. Good on strip mine soils, dikes, and levees. Some switch grass plantings tolerated the great flood of 1993. Now being used for biomass production and carbon sequestration. Interesting in the landscape with its lacy open seed heads with small seeds on end of long slender stems. Provides a wide variety of textures and colors. Many ornamental selections are available. Characteristics and tolerances vary with the cultivars. 224,000 to 404,912 seeds per pound. A wide-ranging, highly variable taxon.

"A common robust panic grass that is found in all our sand areas and to a less extent on high prairies. Uncommon on gravel prairies." (Fell 1955)

Aggressive???? O contraire!, Mooseface. The Blackwell and Cave-in-Rock switch grass cultivars have given this species a very bad reputation, being easily established from seed, competitive against weeds, and of large stature. If all switch grass is as aggressive as most think, then why do we drive past mile after mile of Eurasian *Bromus*, *Festuca*, and *Poa* instead of mile after mile of *Panicum virgatum*? Why aren't we up to our ass in switch grass? The bum rap is from all those 4.5 to 6 foot tall, weed-competative USDA releases. Our local genetic material is mostly well behaved, thank you, and is short, slowly rhizomatous, and turns a beautiful gold in the fall.
Associates: Greatly over rated as upland game bird habitat. It certainly does not have the season long seed production and arthropod production of a mixed prairie seeding. Provides dubious nesting cover and modest amounts of food for wildlife. Birds and small mammals go after seed. Attracts meadow voles and other small mammals. Waterfowl eat seeds and young foliage. Marshbirds, shorebirds, upland gamebirds, and songbirds eat eat seeds. Terrestrial furbearers (esp. rabbits) and aquatic furbearers (esp muskrats) eat plants and foliage. Deer eat plants. Nothing smaller than a bull bison in rut can move through a stand of Cave-in Rock switchgrass, let alone a gamebird. If you are planting habitat, do it right. Friends don't let friends plant switchgrass. Provides pasture and hay for large, strong, livestock. Leaves might cause photosensitization in livestock.

PASPALUM Linnaeus 1759 **Paspalum, Crown Grass, Beadgrass** New Latin, from Greek *paspalos* millet; probably akin to Greek *pale,* fine meal, dust, from which is derived the word pollen. A genus of mostly perennial grasses chiefly of warm regions having flat leaves and spikelets in several rows on secund spikes. The inflorescence consists of spike-like racemes which are racemose along main axis. The spikelets are flat on one one side and strongly convex on the other. Outside some interest in the restoration industry, *Paspalum* is of limited economic consequences, being uncommon and growing in wetlands and dry sterile, sandy soils. Some *Paspalum* species are known to cause seasonal allergic reactions in certain individuals. *P. scrobilatum* grown especially in India, Africa, and Australasia is said to poison the milk of cows that eat it.

Paspalum ciliatifolium Michaux DOWNY LENS GRASS, aka Hairy Bead Grass, Thin Paspalum.
Habitat: Disturbed sand prairies
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment-light-kno3-scarifying may help.
Description: general form bunching culms 1.0-2.0', smooth leaves blades long, thin, 6-15 mm wide, smooth and glabroüs on both surfaces or occassionally with a few hairs along the underside midnerve, long ciliate on the margins sheaths smooth spikes racemes single or in pairs; spikelets in pairs, round or oval, 1.8-2.2 mm long, usually smooth and glabrous, nut sometimes with short, appressed hairs.
"*Paspalum stramineum* (Nash) (*P. ciliatifolium* Michx. var. *stramineum* (Nash) Fer.) Found by us only in the sandy area near the C. B. & Q. R.R. bridge at Killbuck Creek and in Shirland Township." (Fell 1955)
Comments: Blooms 6-9. 412,346 to 560,000 seeds per pound. Early successional in sand.

PHALARIS Linnaeus **Canary-grass, Canary-reed, Sword Grass** New Latin, from Latin, for canary-grass, or Greek name for a grass, from *phalaros* having a white spot; akin to Greek *phalios* having a white spot. North Temperate, South American, and African (American and European in one source) annual and perennial grasses, primarily of temperate regions, with broad leaves and a dense head or spike of flowers. x = 6,7.

Phalaris arundinacea Linnaeus #CT, MA, WA REED CANARY GRASS, aka Canarygrass. (*arundinaceus -a -um* reed-like; having a culm like tall grasses, from the Latin, *arundo*, reed, cane, and *-aceus*, resembles, like) Oddly enough, a lot of the following information is from Anon 1981, IDNR by any other name!
Habitat: Fertile moist lowlands, marshy or swampy soils. Grows in up to 2' of water. Survives drought well. Streambanks, lake shores, wet meadows, marshes. Adapted to poorly drained wetland areas, particularly mucky, sandy loam or silty loamsoils. Fairly resisitant to drought under cultivated conditions, but becoming more so in "the wild". Moderately coarse to fine soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement high. Salinity tolerance medium. Shade intolerant, but it does invade savannas. pH 5.5-8.0. distribution: Native to Europe, Asia, and parts of North America, but not northern Illinois. Very aggressive on upland soils along I-80 near LeClaire, Iowa, and on I-74, Bettendorf.
Culture: Plant in spring, summer, or fall. Matures in less than 90 days. Recommended seeding rate 10-12 lbs. / acre broadcast. Broadcast 1 bulk lb per 4000 sq. ft. or drill 6-8 pls lbs per acre (Stocks). Competitive and aggressive. Drill 5-10 pls lb per acre in fall or spring (Granite). 10-14 lbs per acre (ecs).
Description: general form Large, robust, erect, cool season, long-lived, sod-forming grass adapted to cool, moist sites. roots very aggressive rhizomatous root system, with long scaley rootstocks, which may crowd out other species 14" minimum root depth culms 2-5' leaves rolled in the bud-shoot sheaths not compressed, glabrous, smooth, light green or yellow-green; margins membranous and overlapping below; veins distinct and joined by numerous cross-nerves auricles absent, collar distinct, glabrous, pale green or yellow, continuous, oblique ligule membranous, white, 2 to 5 mm long, acute to obtuse, entire, erose, lacerate or split, minutely hairy on back blades 6 to 15 mm wide, 10 to 30 mm long, flat, sharp-pointed, glabrous or rarely very sparsely hairy at base, light green, glaucous, indistinctly ridged on upper surface; midrib prominent below; margins scabrous, slightly ciliate at base spikes the branches of the panicle are so short they are hidden by the spikelets, giving the appearrance of a spike N 2n = 27, 28, 29, 30, 31, 35.
Comments: Connecticut invasive, not banned, Massachusetts prohibited, Washington Class C noxious weed. Considered invasive in most of the USA. Blooms June to July. This was once considered a valuable meadow grass. If you have no ecological conscious, this grass is useful for erosion control and waterways. Probably the premier waterway-grass, trapping prodigious amounts of sediment. Utilized for erosion control and protection of shores, banks, and dikes. Can tolerate standing water for extended periods of time. On extremely bad sites, some recommend this be used to provide cover for wetland wildlife, but it will contribute "seed rain' to downstream sites. 530,000 to 538,000 seeds per pound.

"Common in damp places. The form with white striped leaves is an occasional garden escape." (Fell 1955)

Reed Canary grass is probably undergoing ecological release and is now occupying well-drained sites. It is particularly evident on the shoulders of Interstate 80 on either side of the Mississippi River. IDOT's and IaDOT's drooling, brain-dead, knuckle-dragging mower jockeys will spread it every where. Canary Grass is also known to invade mesic savannas.
Associates: Upland gamebirds and songbirds eat seeds and spread them. Aquatic furbearers eat the plants, utilize cover, and use plants to build lodges. Fish use cover (esp. fry and prey species). Waterfowl utilize cover and eat plants. Good forage producer, medium palatability when actively growing, otherwise poor, fair palatability at 12-15" height. Best quality hay is harvested at pre-boot stage.

PHLEUM Linnaeus **Timothy, Cat's Tail, Herd Grass** New Latin, probably from Greek *phleos* wool-tufted reed. Temperate region, primarily Eurasian, grasses that have dense oblong or terete spike and long mucronate empty glumes. x = 7.

Phleum pratense Linnaeus TIMOTHY, aka Cat's Tail, Herd Grass, Herd's Grass, Meadow Cat's Tail, *Pléole des Prés, Phléole des Prés*. (*pratensis -is -e* of or in meadows, from Latin *pratens, pratensis*, growing or found in meadows, from *pratum*, meadow) (Common name probably after Timothy Hanson, 18th century American farmer said to have introduced it from New England to the southern States in 1720 (alternately introduced it from England into the United States in 1720). Herd Grass is after John Herd, who found it growing wild in New Hampshire in 1711.)
Habitat: Easily escaping and invading native meadows, pastures, roadsides, and waste places. Deep, moderately moist sites. Medium coarse to fine soils. Neutral to acidic soils, somewhat alkaline tolerant. Anaerobic tolerance low. CaCO3 tolerance high. Drought tolerance low. Fertility requirement medium. Salinity tolerance low. Shade tolerance intermediate. pH 5.0-7.5.
Culture: Aggressive from seed. No treatment needed. Drill 1 lb pls per acre in fall or spring for pasture (Granite). 8 pounds per acre (ecs). Fall seedings grow on warm days late in the season. Growth rate rapid. Seedling vigor high. (Characteristics vary between varieties.) Spreads primarily by seed. Clumps enlarge by tillering.
Description: general form Cool-season, glabrous, short lived?, perennial bunch grass roots shallow, fibrous root system, 10" minimum root depth, but most roots are within the top several inches of soil culms Medium tall, 2.5-3.0 feet, with bulbous bases (haplocorms) leaves rolled in the bud-shoot sheaths not compressed, glabrous, light green, sometimes purplish at base in young plants, split almost to base; margins hyaline and edges overlapping to near base auricles absent collar broad, distinct, glabrous, light green, continuous; margins sparsely retrorse-ciliate ligule membranous, white, 1.0 to 2.5 mm long, obtuse to acute, with distinct notch at either side, otherwise entire or minutely toothed blade 4 to 12 mm wide, 7 to 25 mm long, flat, sharp-pointed, light green, glabrous; ridges on the upper surface low and rounded; under surface smooth, slightly keeled at base; margins scabrous, retrorsely so at the base N 2n = 42 (21, 35, 36, 49, 56, 63, 70, 84) Hike! key features: "Species has spike-like panicle; only one species is in Illinois; has thickened or bulb-like base" (ilpin). "*Phleum pratense* is sometimes confused with *Agrostis alba* but can be distinguished by its white and more opaque ligule with a notch at either side and without hairs on the back. The presence of cilia on the shoulder and less conspicuous ridging of the upper surface of the blade are also diagnostic." (Nowosad etal 1936) "The flower heads of timothy may resemble those of the bristly foxtails (*Setaria* spp.) and the foxtails (*Alopecurus* spp.). The bristly foxtails are annual species that have a hairy ligule and a less dense flower head, with long bristles surrounding the flowers. The foxtails are a mixture of annual and perennial species that are smaller in stature and have soft-textured flower heads. These foxtails are often sprawling, and tend to grow in damp soil. Young plants of timothy may resemble those of quackgrass (*Elytrigia repens*) and orchardgrass (*Dactylis glomerata*). Quackgrass may be distinguished by its claw-like appendages (auricles) at the top of the sheath. Orchardgrass leaves are folded in the bud." (http://www.oardc.ohio-state.edu/weedguide/singlerecord.asp?id=140.)
Comments: Blooms 6-8. Seeds mature 7-8. C3. JUST SAY NO! One of THE NURSE CROPS FROM HELL. Used in riparian restoration. May be weedy. 1,163,200 to 1,300,000 seeds per pound. This species is known to exhibit vivipary, with spikelets changed to leafy tufts. "Said to be native here but also often escaping from cultivation." (Fell 1955)
Associates: Endomycorrhizal. Larval host of *Thymelicus lineola*, European Skipper (Skipperling) (aggressive). Excellent palatability, especially for horses. Commonly planted for pasture or hay. One of the most extensively planted pasture grasses, and the most important hay grass in the U.S. It is usually grown in combination with alfalfa or clover.

Timothy is known to cause seasonal allergic reactions in certain individuals. Timothy is a "prominent cause of hayfever in Illinois" (ilpin). Pollen can cause dermatitis and hayfever.

FRIENDS DON'T LET FRIENDS PLANT TIMOTHY.

PHRAGMITES Adanson **Common Reed, Ditch Reed** New Latin, from Greek *phragmites* growing in hedges, from *phragma* fence, hedge and *-ites* –ite. Widely distributed reedlike grasses with tall stems and large showy panicles resembling plumes. x = 12. [Formerly *Phragmites* Trin.]

Phragmites communis Trin. REED, aka Wild Reed (*communis* common, universal, general; growing in a society or community, for its colonial habit.)
Habitat: Shores of lakes, streams, ponds, and swamps. Fresh or brackish water up to 2' deep. Also occurs in lowlands.
distribution One of the most widely distributed flowering plants.
Culture: First of all, why cultivate? Eradicate instead. Anon 1981 says plant in spring or fall. (This is echoing the recommendations of those who want to sell more plants. Don't fall plant bareroot wetland materials, ever, any species.) 1000 roots per acre. (perhaps for bioremediation sites only??)
Description; Colonial, perennial grass. Provides cover for most types of wildlife, one of it's limited virtues. Said to be good for transpiring lots of water. "Not common. Occasional in prairie sloughs in Grove Creek bottom, in a slough west of Shirland and in Beaver Creek bottom in Boone County." (Fell 1955)

POA Linnaeus 1753 **Bluegrass** New Latin, from Greek, *poa* grass, or fodder; akin to Greek *pidax* spring, Lithuanian *pieva* meadow. A cosmopolitan genus of about 500 species of annual and perennial grasses mainly temperate and boreal areas. Many species are polyploid and apomitic.

Poa palustris Linnaeus *TN FOWL BLUEGRASS, aka Fowl Meadow-grass, Marsh Blue Grass, Swamp Meadow Grass (*palustris* marsh-living, of swamps, of marshes, or growing in bogs, marsh loving, from Latin *paluster -tris -tre* marshy, boggy)
Habitat: Marshes, wet thickets, upland swamps. "Not unusual in low meadows and other damp areas." (Fell 1955) Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance low. Shade tolerance intermediate. pH 4.9-7.5
Culture: No treatment, light. No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Plant 3 lb pls per acre in fall or spring for pasture. (Granite). Moderate growth rate. Seedling vigor medium. No vegetative spread rate.
Description: general form Cool season bunch grass forming loose tufts roots from short root stocks, 12" minimum root depth culms produces a few leafy shoots to 4' leaves folded in the bud-shoot sheaths compressed and keeled, glabrous, slightly scabrous, green, split nearly to base with margins overlapping part of the way; margins scarious auricles absent collar distinct, glabrous, pale green, V-shaped ligule membranous, 1.5 to 3.5 mm long, acute, entire or often toothed blade 2 to 4 mm wide, 7 to 15 cm long, flat or slightly V-shaped, keeled, broad at base, tapering to tip, slightly scabrous, pale green, not ridged but showing two light lines along midrib which are more distinct near the tip than at the base of blade; margins minutely hairy, retrorsely so at base N 2n = 28, 30, 32, 35, 42, 56, 84 key features: long acute ligule, compressed and keeled sheaths, and broad truncate-based blades which stand erect or ascending on the shoots
Comments: Blooms 5-7. Useful as quick cover in wetland restoration and detention basins. 2,624,277 to 3,156,000 seeds per pound.
Associates: Provides food and cover for wildlife.

Poa pratensis Linnaeus KENTUCKY BLUEGRASS, aka June Grass (*pratensis -is -e* of or in meadows, from Latin *pratensis -is -e,* growing or found in meadows, from *pratum*, meadow) (native in a small part, a subspecies with a limited range)
Habitat: Considered invasive in most of the USA. Common in pastures, meadows, roadsides, and lawns. Does best on good soils with adequate moisture. Most of the turf areas of the temperate United States. Likes sun, some shade tolerance, but turf grasses and trees do not peacefully co-exist. Moderately coarse to fine soils. Anaerobic tolerance low. CaCO3 tolerance high. Drought tolerance low. Fetility requirement high. Salinity tolerance low. Shade intolerant. Neutral soils, some acid and base tolerance. pH 5.0-8.4.
Culture: Seed spring or fall. Germination in 14 to 28 days, some varieties in 10 to 28 days. For pasture drill 12-20 lb per acre, for turf drill 3 lb per 1000 sq ft (Stocks). For new lawn seed 4 lbs per 1000, for overseeding established lawns seed 2 lb per 1000. Granite says 2-3 lb per acre in fall or spring for pasture. Arthur Clesen says 4-5 lb per 1000 sq ft. Seed 25-50 lb alone (ecs). Growth rate moderate. Seedling vigor low. Vegetative spread rate rapid. Considered slow to germinate and establish.
Description: general form Cool-season, long-lived, medium tall, dark green, leafy perennial dense sod-former from creeping rootstocks roots shallow root system with vigorous rhizomes, 10" minimum root depth culms 1-2' leaves folded in the bud-shoot sheaths compressed but not sharply keeled, glabrous, green, closed when young but later split with margins sometimes overlapping auricles absent collar medium broad, usually ciliate, yellowish green, slightly divided by the midrib ligule membranous, very short (0.2 to 0.6 mm long), truncate, entire to finely ciliate, puberulent on back, blade 2 to 5 mm wide, 5 to 40 mm long, usually V-shaped, tightly folded in dry weather, keeled below, parallel-sided and abruptly narrowed to a boat-shaped tip, sometimes minutely pubescent, not ridged, deep green, sometimes shiny on under surface, not glaucous; margins scabrous; the row of motor cells on each side of the midrib shows as two light lines by transmitted light; the long blades forming almost right angles with the axis of the shoot key features: "*Poa pratensis* is distinguished from *P. compressa* by the deeper green colour of its foliage, by the longer, parallel-sided blades, which are sometimes puberulent towards the base, and by the shorter ligule. This grass, when growing in dry situations, has its narrow blades closely folded and might easily be confused with *Festuca rubra*. The absence of ridges on the inner surface when the blade is unfolded will distinguish it." (Nowosad et al 1936)
Comments: Blooms May to June. Needs well drained soil with adequate moisture. Rhizomes are concentrated in top 2" of soil. Forms a good sod when grown alone, but performs well in a mix. Renews growth in early spring, matures in late summer, with vigorous fall regrowth. Not drought tolerant, dormant in hot dry months. Tolerates cold winters well. Highly palatable and nutritious to livestock and wildlife, but grazing yield is low compared to other pasture grasses. Kentucky Bluegrass goes dormant during hot dry periods. Used for pasture improvement, land reclamation, and turfgrass. An excellent general utility grass. Poor for shade areas. Good for play areas. Good for fairways. The characteristics of the grass vary with the variety. Some cultivars are shade tolerant or quicker to germinate. Bluegrass is known to cause seasonal allergic reactions in certain individuals. 1,389,840 to 2,200,000 seeds per pound. *Poa pratensis* known to chemically inhibit Azalea, barberry, yew, forsythia, flowering dogwood (Chick and Kielbaso, 1998).

Poa trivialis Linnaeus ROUGH BLUEGRASS, aka Rough Stalked Bluegrass, Rough-stalked Meadow-grass. (*trivialis -is -e* common, ordinary, wayside, of crossroads, from *trivium,* a place where three ways meet; a crossroads.)
Habitat: Introduced, considered invasive in some areas. Wet meadows, moist woods, and roadsides. Rich soils in wet meadows, ditches, and cultivated fields. Uncommon except where recently seeded. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. No salinity tolerance. Shade tolerant. pH 4.8-7.5.
Culture: Seed 23-30 lbs per acre alone (ecs). Growth rate moderate. Seedling vigor high. No vegetative spread rate.
Description: general form Cool season, bright green, moderately long-lived perennial bunch grass roots 12" minimum root depth culms 1-2' occasionally 3' leaves folded in the bud-shoot sheaths compressed and sharply keeled, generally scabrous, green or purple tinted, split part way only auricles absent collar broad, distinct, glabrous, divided by the midrib ligule membranous, 2 to 3 mm long, acute, entire or ciliate blade 2 to 4.5 mm wide, 7 to 15 mm long, flat, tapering from the base to the tip which is narrowly boat-shaped, yellowish green, slightly retrorsely scabrous on upper surface, glossy and keeled on lower surface; median lines not prominent; margins scabrous key features "This grass resembles a few other species of *Poa* but may be distinguished by its scabrous sheath and the glossy under-surface of the blade." (Nowosad etal 1936)
Comments: Blooms June to July. Provides food and cover for wildlife.

PUCCINELLIA Parlatore **Alkalai Grass, Goosegrass** after Benedetto Luigi *Puccinelli*, 1808-1850, Italian botanist and professor, director of the Botanical Gardens of Lucca. A genus of about 80 (120) north temperate species. Many species are halophytic. Polypoidy, selfing, and hybridization. x = 7. See *Glyceria* in part.

Puccinellia distans (Jacquin) Parlatore ALKALIGRASS, aka European Alkalai Grass, Reflexed Saltmarsh-grass, Weeping Alkali Grass. (*distans* distant, separate, remote, far apart, straggly)
Habitat: Adventive on salty roadsides. Adapted to moist, or periodically moist, saline soils. Able to tolerate periodic flooding and shallow water tables. Best in medium to fine soils. Full sun. Basic to neutral soils. Introduced from Europe.
Culture: Plant 4 lb pls per acre in fall or spring for pasture (Granite). 2-3 lb per thousand Brad James @ TriCounty Stockdale (personal communication).
Description: Cool-season, short to medium tall, 6-16", perennial, sod-forming, (bunch in Granite) with strong shallow, fibrous root system.
Comments: Blooms June. Moderately palatable. Excellent for cover and erosion control on saline soils. Turf grass. "Fults" is a selection that persists on sandy sites. It produces a dark green sod, does well in lawns and roadsides. "Salty" is also available. 1,200,000 seeds per pound.

SCHIZACHYRIUM Nees **Little Bluestem** From Greek *schizo,* to split, and *achyron*, chaff, referring to the divided lemma. Approximately 60 species, annual and perennial, mostly tropical and subtropical grasses. Nine species are native to north America north of Mexico. *Schizachyrium* differs from *Andropogon* and *Bothriochloa* in having only one rame per peduncle (usually), cupulate tips of the rame internodes, convex lower glumes, and the presence of veins between the keels of the lower glumes. x = 10.

SECALE Linnaeus 1753 **Rye** New Latin, from classical Latin name for rye. A genus of 3 species of cereal grasses native to the Mediterranean region and western Asia, having the 2-flowered spikelets in a dense spike, the lemma tipped with a long awn, and the empty glumes one-nerved. x = 7.

Secale cereale Linnaeus CEREAL RYE, aka Rye, *Seigle, Siegle Cultivé* (pertaining to Ceres or agriculture)
Habitat: Does well in coarse soils, better in moderately coarse to moderately fine soils. Introduced ffrom Eurasia.
Culture: Easy to establish and may aggressively spread to surrounding sites. Monoculture plant 90 lb per acre in fall or spring (Granite).
Description: Cool-season, drought tolerant, tall, annual grass, very adaptable. 2n = 14, 21, 28.
Comments: Often used for quick cover or as a soil binder while perennial species are establishing. In Canada used for the production of whiskey. Take two fingers daily. For crop purposes in northern Illinois, plant between September 25 and October 15. 18,000 seeds per pound.
WINTER RYE. Tolerant of poor soils. Sow in fall, overwinters as a seedling, to 4' in spring. 2 lbs. per 1000 ft. sq. (pots 2000). As green manure, till under before stems get stiff (three nodes).

SORGHASTRUM Nash **Indian Grass** *Sorghastrum* New Latin, an inferior sort of Sorghum, from Italian *sorgo*, perhaps from (assumed) Vulgar Latin *Syricum (granum*), from Latin *Syricum*, neuter of *Syricus* Syrian, and *granum* grain, and *astrum*, Latin suffix indicating an inferior sort or a poor imitation. A genus of 18-20 species of mostly of tropical and subtropical America, two African species, four in northern North America. Closely related to *Andropogon*, but spikelets are in panicles. x = 10.

Sorghastrum nutans (Linnaeus) Nash. INDIAN GRASS, aka Yellow Indian Grass, Wild Sorgham, Wood Grass (*nutans* nodding, from Latin *nuto, nutare*, to nod or sway)
Habitat: Native in most grassy native communities, hill and sand prairies, dry, mesic, and wet prairies. Prairies, open woods, roadsides, fields, dry slopes. Most soil textures where moisture is adequate. Adapted to wide range of soil textures. Tolerant of poor drainage. Performs well on well drained bottomlands, but does well on sandy soils. Occurs in coarse to fine soils. Neutral to acidic to basic soils, wide pH range. Prefers mesic prairie zone. No tolerance of inundation in urban restorations. Nutrient load tolerance low. Siltation tolerance low to moderate. Anaerobic tolerance low. CaCO3 tolerance high. Drought tolerance medium. Fertility requirement low. Salinity tolerance medium. Shade intolerant, full sun. pH 5.0-7.8. Some characteristics may vary with the variety.
Culture: Most easily established from seed. "No pretreatment considered necessary. May cold moist treat. Light cover. Excellent germination." (Dunham 1993). No pre-treatment necessary other than cold, dry stratification. (pm 09). No treatment, can fall plant or sow late April to June. Cold moist stratify may help with some lots. Successional restoration, easy from cold stratified seed. Drill ¼ to ½ " deep in April to May, 4 to 6 pls lbs per acre for dry western pastures. Anon 1981 recommends 10-15 lbs. acre broadcast. Broadcast 1 lb pls per 2,000 sq. ft., or drill 10 pls lbs per acre (Stocks). Granite says 6 lb pls per acre for pasture in spring. In mixes plant 2.5 to 6.0 pls lbs per acre (USDA 1997). The following vary with the variety. Growth rate moderate to rapid. Seedling vigor medium. Vegetative spread rate slow to moderate.

Some commercial varieties commonly used in northern Illinois are very short, quite hairy, pale green, and only vaguely resemble local stock.

Debearded seed is a product that is more free flowing than typical seed. Debearding is not necessary for drilling, broadcasting, or hydroseeding. Debearded seed is a value added product, and obviously more expensive. Debearded grass seeds may dehydrate quicker than other seed, and have problems arising from mechanical damage. But, as my father said, Indian grass flows like shit through a tin-horn anyway, so why debeard this species?

This is the second grass species to establish in tall-grass restorations, after Canada Wild Rye. When planted with Big Bluestem, Indian grass is successional and will decline in the restoration. Big Blue and Indian are the heart and soul of the tall grass prairie (pots 2000).
Description: Tall, warm-season, long-lived perennial bunching sodforming grass. 4.0- 7.0'. Spreads by seed, somewhat aggressively to the point of being invasive in some plantings. Individual plants increase by short scaly rhizomes. Hairy nodes on stems, leaf sheath with long hairs near collar, deeply notched "horn-like ligule; 2n = 20, 40, 80.
Comments: Blooms 8-9. Dried seed heads, landscaping, erosion control. "When in bloom it is one of most beautiful of our native grasses, with its graceful bronze-colored panicles and bright yellow anthers" (Mosher 1918). Useful for soil stabilization on slopes. Good erosion control but develops over 2 years. Foliage slows run off. One of the more attractive grasses when in seed, with golden plume-like, bending seed heads, above the burnished leaves. Seedheads good in dried arrangements. Reddish-yellow winter color. Aggressive, soil forming, decreases under grazing. 168,000 to 224,697 seeds per pound. "A tall graceful grass that is common in much the same place as big bluestem." (Fell 1955)
Associates: Good habitat grass and cover for birds, songbirds, and small mammals. Attracts upland gamebirds, songbirds, marshbirds, muskrats go for roots, good nesting cover. Said to attract butterflies (USDA 1997) (Maybe as larval host.) One of most important native forages, highly palatable and very nutritious. Excellent forage for livestock and wildlife, used for pasture and hay.

"…. Below the hill grows a field of high Indian grass that changes color with the seasons: go to see it in the fall, late September, when it has gone red as sunset, when scarlet shadows like firelight breeze over it and autumn winds strum on its dry leaves sighing human music, a harp of voices."

-----The Grass Harp, Truman Capote

SPARTINA Schreber **Cordgrass, Marshgrass, Saltgrass** New Latin, from Greek *spartinen* rope, cord; or Greek *spartion* esparto grass, akin to Greek *speira* spiral. Alternately from Greek *spartine* " a cord made from *spartes*", *Spartium junceum* Linnaeus Spanish Broom, referring to the toughness of the leaves, although the spikes do resemble a small rope. A small genus of 16 (15-17) species grasses occurring chiefly in salt marshes and interior (usually saline) wetlands of Europe and North and South America, and North Africa, and having stiff culms, panicled spikelets, and flowers with three glumes. Several species have become serious weeds threatening local ecosystems when established beyond their native ranges. Locally established in China. Wind pollinated. Native species are self incompatible. Fruits are grains. x = 10.

"All but *S. pectinata* are considered hydrophylic and should be either sown as soon as they are collected in late summer (Seed will germinate immediately, or if temperatures have cooled, in spring) or kept sealed under refrigeration until spring. Code A (*)" (Cullina 2008) In older references it has been noted that *S. pectinata* was double dormant and needed warm moist stratification followed by cold moist stratification. When doing so, germination typically

occured during warm moist stratification. Other sources noted that the seed should be soaked in water and stored cold, indication drying was harmful. Our experience with Illinois seed and seed from other midwestern states indicates *Spartina* seed is non-dormant, but it has a short shelf life when dry stored in woven poly bags. For almost twenty years, the industry has been dancing around the fact that *S. pectinata* seed is hydrophylic and needs stored in sealed plastic containers under refrigeration until planting.

Some job specifications are now being written with a requirement that *Spartina pectinata* and *Sporobolus heterolepis* seed be no more than 6 months old. With *Spartina* being harvested in September to October, this limits its seeding season from November to no later than April. Many large producers do not release new crop seed until February, creating problems. Appropriate specifications would be something like "*Spartina pectinata* and *Sporobolus heterolepis* seed shall have been cleaned and immediately placed in cold storage (34-36ºF) in a manner to maintain maximum viability prior to seeding."

Spartina pectinata Link (or Bosc ex Link) (seen as Lind.?) *WA PRAIRIE CORD GRASS, aka Cord Grass, Slough Grass, *Spartine Pectinée,* Freshwater Cord Grass. (*pectinata* comblike from the one sided spikes)
Habitat: Marshes, wet and mesic prairies; wet savannas, wet ditches. Moist ground along roads, marshes, shores, wet prairies, swamps. Sandy shores and floodplains. Wet meadow conditions, saturated soils to seasonally 3" standing water. On some dry, saline roadsides in northern Illinois, this species has persisted for several decades. Tolerant of seasonal flooding. Nutrient load tolerance moderate to high. Siltation tolerance moderate. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none (usda) or low to moderate. Shade intolerant, full sun. pH 6.0-8.5 (usda) or 4.7-7.8.
Culture: No treatment, saturated soils, viability in some seed lots will be low, *Spartina* germinates readily when sown on warm, moist wet soil. Cold moist stratified seed is not necessary. "Cold moist treatment, or no treatment. Light cover. fair, but reliable germination" (Dunham 1993). No pre-treatment necessary other than cold, dry stratification (pm 09). In mixes plant 0.125 to 2.0 pls lbs per acre (USDA). Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid.

Plugs are preferred for establishment, since in the past some (many) seed lots had low viability, and bare root divisions from some sources are minimally small. Plant plugs and bare root material at the same depth it had been growing, 2-5", on 1-3' centers, in April or May. Young (????) transplants work best (USDA 1997). New plants require saturated soil to establish and maintain stands.
Description: Perennial grass, 5-7' warm season, strongly rhizomatous. 2n = 40, 40+1, 80 [42, 72, 84]
Comments: Blooms 6-8. C4. Attractive dried seed heads. Useful in landscaping, wetland restoration, and long term erosion control, with aggressive sod-forming root system. Useful in uppershoreline zones, streambank stabilization, upland slope stabilization, and vegetated swales. Annual burning said to stimulate seed production. Remnant populations vary in seed production between years, with much seed often insect damaged. Said to compete with reed canary grass when established. 105,600 to 204,229 seeds per pound.

"A common tall growing marsh grass which is most frequent in wet places in prairie areas." (Fell 1955)
Associates: The pollen of this species may cause hayfever. Provides good wildlife cover. Attracts small mammals, songbirds, gamebirds, good nesting cover, esp. marsh wren. Waterfowl eat rootstocks and seeds. Marshbirds, shorebirds, and songbirds eat seeds. Aquatic furbearers, esp. muskrats, eat rootstocks and plants. Deer and rodents eat young tender growth, older growth not readily grazed.

SPOROBOLUS R. Brown 1810 **Dropseed, Rushgrass** New Latin *spora*, akin to Greek *spora, sporos,* "seed" the act of sowing, seed, *speirein* to sow, strew, and from *bolos*, *ballien* to throw, to cast forth, literally the seed thrower. Related to sprout, and spore. Wind pollinated. The fruits differ from most grasses, being utricles or achenes, with the pericarp free from the seed, becoming mucilaginous when moist in most species, or remaining dry and partially adherent to the seed in *S. heterolepis* and *S. clandestinus.* (*Calamovilfa also has fruits with a free pericarp.*) About 160 species of annuals and perennials of tropical, subtropical, and warm-temperate regions of the New and Old World. In all states except Alaska. x = 9.

Sporobolus airoides (Torrey) Torrey ALKALAI SACATON (resembling Hair Grass, *Aira*)
Habitat: Western alkaline prairies, fine textured soils. Does best on deep, moist, fine-textured soils, but will persist on coarser soils on drier sites. Will do well on saline or sodic soils. Moderately coarse to fine soils. Basic to neutral soils.
Culture: No treatment. Drill 2-3 pls lbs per acre in late summer for pasture (Granite). Easy to establish. Small projects plant 0.25 lb pls per acre; or 6 pls lbs per acre for reclamation (pots 2000).
Description: Perennial grass, warm-season, coarse, 2-5', perennial bunch grass, with extensive fibrous root system. Light airy seed heads borne above bluish foliage.
Comments: Tolerant of flooding, medium palatabable when green, up to 8', attractive grass, ornamental, Good stabilization for blowing sand. Valuable cover for birds and small mammals. 1,758,000 to 2,000,000 seeds per pound

Sporobolus asper (Michaux) Kunth ROUGH DROPSEED, aka *Sporobole Rude* (*asper -era -erum* rough, sharp to the touch, from Latin *asper, asperi*, rough, in reference to the surface texture.)
Habitat: Railroad prairies, roadsides, disturbed prairies, dry often sandy soil distribution General range centered on the Plains, east to ne USA.
Culture: No treatment. No pre-treatment necessary other than cold, dry stratification (pm 09).
Description: 1.5-3', N 2n = 54, 88, 108.
Comments: Blooms 9-10. C4. 480,000 to 591,917 seeds per pound. The pericarps are gelatinous and slip from the seed when wet.

According to POTCR (1994), this plant has the ecology of an invasive and is increasing in the Chicago region. In our area, weedy dropseeds are starting to dominate some disturbed, rural roadsides.

"A grass of dry soil which is common in our sand areas and also on high prairies and the sandy prairies in the Camp Grant area." (Fell 1955)

Sporobolus cryptandrus (Torrey) A. Gray *CT, NH, PA SAND DROPSEED (*cryptandrus* with hidden stamens or anthers, Latin *crypta*, from Greek κρύπτη, *krypte*, vault, from κρυπτός, *kryptos,* hidden, concealed and modern Latin -*andrus*, from Greek -ανδρος -*andros*, from ἀνδρ-, *andr-,* stem of ἀνήρ, *aner*, man.)
Habitat: Disturbed sand prairies, open sand savannas. Sandy black oak woods. Dry sandy flats along the Mississippi River. Loess hills and pahas. Infrequent on exposed limestone soils. Characteristic of very sandy soils, often disturbed soils. Dry sandy soils, but west performs well on medium textured soils. Thrives on sandy sites. Best in coarse to moderate soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement low. Salinity tolerance medium. Shade intolerant. Neutral soils, acidic and basic tolerance, pH 6.6-8.0. distribution Occasional in northern 1/3 and western counties, absent elsewhere
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment, cold moist stratification may help. Broadcast 1pls lb per 43560 sq. ft. or drill 0.5 pls lb per acre. (Stocks catalog). Establishes easily. Granite says 1 lb pls per acre in late summer alone. Small projects seed 0.25 pls lb per 1000 ft sq, or for reclamation plant 6 pls lbs per acre (pots 2000). Growth rate moderate. Seedling vigor low. Vegetative spread rate none. Spreads rapidly from seed.
Description: general form Warm-season, medium tall, perennial bunchgrass, very drought tolerant. roots 18" minimum root depth culms 1-4', all the culms in a stand curve the same direction sheaths with transparent margins collar a ring of short stiff hairs around blade flat and about 1/8 wide, finely toothed margins, blade below inflorescence is normal to the stem key features: "Species has tufted or solitary culms sheaths densely villous; panicles enclosed in the sheaths for varying lengths, panicles open." (ilpin)
Comments: Blooms 6-8. C4. Very good for reclamation and erosion control of sandy land. Will out perform sand love grass on hot, dry sandy sites, and may become aggressive on these sites. Useful for erosion control on these sites. Establishes quickly from seed. Quickly colonizes vacant sandy land, palatability low, fair winter forage. May be short-lived. 1,636,036 to 5,600,080 seeds per pound.

"Common in all sand areas, for that reason called sand drop-seed. Easily recognized by the tuft of hairs at the top of the sheath." (Fell 1955)
Associates: Granite says good palatability to livestock and wildlife, but considered an invader in Midwest, where livestock prefer it less than other grasses. Provides food and cover for wildlife. Sand Dropseed increases on sites that are overgrazed during the summer.

Sporobolus heterolepis (A. Gray) A. Gray *CT, KY, MA, MI?, NY, NC, OH, PA PRAIRIE DROPSEED, aka Northern Dropseed, Northern Prairie Dropseed, *Sporobole à Glumes Inégales* (variably scaled, from *heter- heteros*, variable, different, not-alike, and *lepid-, lepis* scale, flake, small plate, capsule)
Habitat: Mesic to dry prairies, uplands occasionally dominant in wet mesic prairies on the south side of Chicago. Dry soil, rocky prairies, dry open ground. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 6.0-7.2. distribution Occasional in n. 1/2 Illinois, rare south.
Culture: Seed must be allowed to fully ripen for good germination. Easy from fully ripe, dry stratified seed, which should remain in cold storage until sown. "No pretreatment necessary. May cold moist treat. Light cover. Variable, very good to fair germination" (Dunham 1993). No pre-treatment necessary other than cold, dry stratification. It is beneficial to store the seed in ziplocks in the refrigerator until sown. (pm 09) Flood et al 2001 recommends cold moist stratification for 90 – 120 days @ 34-36º F and germination at 70-80º days and 65-75º nights. Bottom heat helps. Successional restoration. Anon 1981 recommends 4-6 lbs per acre (but this is cost prohibitive, and this species is very slow from seed). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Occasionally volunteers, but does not freely self sow.
Description: Fine-textured, aromatic ornamental, beautiful warm season clump-type, long-lived perennial grass. 2.0-3.0' Leaves are medium green, fine textured and hair-like. 12" minimum root depth. 2n = 72. key features: "Tufted with erect wiry culms. Involute leaves a specific identifier. Conspicuous large clumps of handsome, narrow, almost

hair-like blades, which are mostly basal & curl or arch backwards. Long exerted, open panicles, purple to blackish." (ilpin)
Comments: Blooms 8-9. C4. Attractive, aromatic dried seed heads, landscaping. Slow growing and slow to establish. In flower beds with rich organic soils and regular foliar feeding, plants become large significantly quicker. The inflorescences are aromatic, some liken the smell to hot buttered popcorn, while some do not like it at all. Occasional plants have a reddish fall cover. Provides food and cover for wildlife. Attracts songbirds, small mammals, important food source. Upland gamebirds, songbirds, and small mammals eat seeds. Deer eat plants. 197,391 to 272,154 seeds per pound.

Western and northern ecotypes are not as robust as northern Illinois materials. We have found a clump north of Ohio, Illinois that is 4 feet in diameter. "Rather common on high prairies but not on sand." (Fell 1955)

STIPA Linnaeus **Bunchgrass, Needlegrass, Feathergrass, Oat Grass, Porcupine Grass, Sleepygrass, Speargrass** New Latin, from Latin *stupa, stuppa* coarse part of flax, tow, oakum, a loose bunch of fibers, from Greek *tuppe* tow, fibre, from the resemblance of the awns to fibers of jute or flax when ready to be spun. Also Middle English *stupe, stuppe*, from Latin *stupa, stuppa* coarse part of flax, tow, from Greek *styppe*; perhaps akin to Greek *styphein* to contract, be astringent, Sanskrit *stuka* tuft of hair. A large widely distributed genus of tufted annual and perennial grasses having a one-flowered spikelet and lemma terminating in a long twisted or bent awn. 150 species in temperate areas of both hemispheres. *S. tenacissima* is ESPARTO GRASS which was/is used to make cordage. *Stipa robusta* of the southwestern United States and northern Mexico causes a deep sleep in horses or sheep that feed on it. Wind pollinated.

According to current usage, *Stipa* is Eurasian .

Hesperostipa (M.K. Elias) Barkworth The genus *Stipa* is divided by some into *Hesperostipa* (5 species in North America), *Piptochaetium* and *Nassella (also Mexico and Texas?)* (both in South America, with *Stipa* applying to ca. 150 Eurasian and North African species). *Hesperostipa* is from the Greek *hesperos*, the west, or where the sun is in the evening, and the generic name *Stipa*. Perennial, cespitose, 5 species in genus, 4 in North America north of Mexico. x = 11

Stipa comata
60 days cold moist stratification. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. (pm 09) Endomycorrhizal.

Stipa spartea Trin. * OH PORCUPINE GRASS, aka Needle Grass (pertaining to the broom or *Spartium,* broomlike)
Habitat: Mesic, dry, sand, hill prairies and savannas, particularly sandy prairies. Sandy ground or prairie soil. occasional in north 2/3 of Illinois, nearly absent in south.
Culture: "Sow fresh seed for germination the following spring, or late fall sow, or cold moist treat and sow early spring. Prefers cooler soils. Light cover. Fair germination." (Dunham 1993). 60 days cold moist stratification. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. (pm 09) From cold stratified seed. Cold moist stratify or fall plant-cool soils-successional restoration. The long-awned needle-sharp seeds are a restoration pain in the ass. Even with the awns removed, this species can not be drilled, broadcast, or hydroseeded. In comercial restorations, plugs are the cost effective way to establish this species.
Description: Culms 2.0-3.0', 2n = 44, 46. key features: "It is often confused with needle-and-thread grass, but its leaves are longer generally less rolled, lighter in color, and considerably wider (Goetz 1963). Not really an ID problem in Illinois.
Comments: This species may be an economic weed in some areas, for the seed damaging animals and wool. Blooms 5,6. C3. Landscaping, attracts game birds, important food source. Cool season, bunching, dried seed heads sharp! Seeds may injure livestock. 10,880 to 24,280 seed per pound. Fruit is a sharp-pointed grain with a long awn.

"Locally abundant on high dry prairies especially the gravelly ones around Rockford. Uncommon elsewhere in the county except in the Sugar River sand area."(Fell 1955)

TRIDENS aka **Triodia Tridens, Triodia, Redtop, Fluffgrass** Latin *tres*, three, and *dens*, tooth, referring to the three shortly excurrent veins of *Tridens flavus*, the type species. Fourteen perennial species native to the Americas. x = 10

For *Triodia* New Latin, probably from Greek, meeting of three roads, from *triodos* point where three roads meet, from *tri-* three and *hodos* way, road, perhaps from the three nerved lemmas. *Triodia* is Australian, and in some taxonomies, American perennial grasses having long narrow leaves and florets with prominently 3-nerved lemmas. Several Australian *Triodia* species form dense almost impassable growths with stiff, sharp-pointed leaves.

Tridens flavus (Linnaeus) A. S. Hitchc. *NJ (in part) FALSE RED TOP, aka Grease Grass, Greasy Grass, Purple Top, Purple Top Tridens, Tall Red Top (Latin *flavus*, yellow)
Habitat: Disturbed sand prairies, sandy roadsides, fields and edge of woodlands. Well adapted to shallow, droughty, infertile soils. Adapted to coarse, medium, and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance high. Fertility requirement low. Salinity tolerance said to be none, but it thrives on roadsides?

Shade intolerant. pH 4.5-6.5. distribution Rare in northern 1/5 of Illinois, but becoming more common in nw Illinois. It was first discovered in Canada in 1976. This species may be invasive and moving northward.
Culture: 60 days cold moist stratification (pm 09). Cold moist stratification (Davis 2001, Grabowski 2001) Cool season grasses must be eliminated and seedbed must be firm. Drill 10-15 pls lbs in spring or broadcast 20 to 25 pls lbs per acre (USDA). Some recommend cultipacking after no till drilling. Growth rate moderate. Seedling vigor high. Vegetative spread rate none. Spreads rapidly from seed.
Description: Warm-season bunch grass. 3.0-4.0'. 10" minimum root depth key features: Versus *Tridens strictus*, this species has a very open, loose panicle; most Illinois material with purple, rather than yellow spikelets. As seed matures, inflorescence branches and culm top secrete a sticky substance that darkens on exposure to air and dust; will leave a greasy black streak when handled." (ilpin) 2n = 40.
Comments: Blooms 6-9. C4. Ornamental, creating an attractive purple-haze in late summer. Some authorities see this as a potential roadside alternative to Tall Fescue. It *appears* benign in degraded areas and roadsides. Individual plants may be short-lived, but stands persist by seeding. 465,000 seeds per pound.

TRIPSACUM Linnaeus **Gamagrass, Gammagrass, Sesamegrass.** New Latin, from Greek *tripsis* rubbing, friction, resistance to rubbing, possibly from Greek *tribein* "to rub" referring to the smooth joints. A genus of about 12 species of coarse perennial grasses of the southern United States and South America having androgynous spikes with the 2-flowered staminate spikelets above and the pistillate below with the latter embedded in the joints of the rachis. x = 9.

Tripsacum dactyloides (Linnaeus) Linnaeus *MA, NY, PA EASTERN GAMMA GRASS, aka Bullgrass, Fakahatchee Grass, Gama Grass, Northern Gama Or Gamma Grass, Sesame Grass (finger-like, from Latinized Greek *dactylus*, finger and *–oides*, like or resembling, or resembling *Dactylis*, orchard grass)
Habitat: Mesic prairies, low ground, usually in moist, heavy soils. "Moist soil in swamps or along ditches and streams" (Mosher, 1918). Swamps and wet shores. Adapted to coarse, medium and fine textured soils. Anaerobic tolerance low. CaCO3 tolerance none. Drought tolerance low. Fertility requirement high. Salinity tolerance none. Shade intolerant. pH 5.1-7.5. distribution A rare adventive in our area (Bureau and Henry cos.), native south and west of our area, southern 2/3 of Illinois, and southern Iowa. Throughout eastern 1/2 of US.
Culture: Fall plant or cold moist stratify required. 60 days cold moist stratification. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Best planted outdoors in the fall. (pm 09) Broadcast 1 pls lb per 2000 ft sq, or drill 10-12 pls lbs per acre in rows (Stocks). 8-10 lbs per acre for solid stand (ecs). Growth rate rapid. Seedling vigor low. Vegetative spread rate moderate. Spreads slowly by seed. 1st year seedings may be subject to frost heaving.

USDA treating instructions are " The seeds must first be stratified (exposed to cold, wet conditions) for 8 weeks before spring sowing. Seed may be purchased stratified from commercial growers. To stratify artificially, place the seeds in a burlap bag until the bag is about 1/2 full. Soak this in a 1% solution of fungicide for 10-12 hours. Afterwards, drain the seeds and seal them, along with the sack, in a plastic bag. Store them this way for 8 weeks at 35-45 °F. Stratification may also be achieved by planting in the fall after November 1, but before frost is in the soil." (USDA Plant Fact Sheet)
Description: Native, warm season, perennial, tall grass growing in large clumps, 1-4' diameter. 3.0-6.0 ft, occasionally 9' tall. Entire plant glabrous. Flowers are monoecious, staminate spikelets at the end of the spike and pistillate spikelets at the base. Minimum root depth 20". 2n = 40, or 2n = 36, 54, or 72.
Comments: This species is also considered invasive in parts of its range. Blooms 6-8 Landscaping, sometimes used as an ornamental grass. 5,968 to 7400 seeds per pound. A perennial close relative of corn, with inflorescence of 1-3 spikes with female flowers (the "ear") on bottom and male flowers (the "tassel") on top. One of most productive hay grasses in USA, more productive than other native perennial warm season grasses. With careful management it regrows vigorously after grazing or haying. Excellent forage, palatable and nutritious to livestock. Provides food and cover for wildlife. 5,920 to 6,000 seeds per pound. We have two adventive colonies, one ¾ mile sw of Zeahring along the railroad spur to Ladd, discovered by Don Prestzch, and the other in the north intersection of Rts. 92 and 78, se corner, on IDOT land. The IDOT population has survived regrading the intersection and drooling, brain-dead, knuckle-dragging, mower jockeys since it was discovered in 1979.

TRITICUM Linnaeus 1753 **Wheat** New Latin, from Classical Latin for wheat; akin to Latin *terere* to rub, thresh. A genus of about 25 wild and domesticed species of cereal grasses including the wheats and distinguished by the 2- to 5-flowered flattened spikelets in a terminal cylindrical spike with a flexuous rachis. x = 7.

" 'Spring wheat' and 'winter wheat' refer to the growing season. Spring wheat is planted in the spring and harvested in the summer of the same year; winter wheat is planted in the fall and harvested the following summer. "Hard wheat" and "soft wheat" are terms used to describe wheats with flinty or mealy endosperm, respectively. Flinty endosperm has a higher protein content and is harder than mealy endosperm. At the species level, soft wheat refers to *T. aestivum*; hard wheat refers to *T. durum*. Within *T. aestivum*, endosperm type also is graded as either soft or hard; it is never as hard (flinty) as in *T. durum*." (fna)

Triticum aestivum Linnaeus WHEAT, aka Bread Wheat, Common Wheat, Soft Wheat (*aestivus -a -um* Latin of summer, flowering in summer**.**)
Habitat: Moderately coarse to moderately fine soils. Neutral soils, some base and acid tolerance.
Culture: Alone plant 60-100 lb per acre in fall or spring (Granite). For a crop, drill 100-110 lbs per acre, 1 to 1.25 inches deep. In northern Illinois do not plant before the third week of September to avoid Hessian flies (pre-global warming timing).
Description: Cool-season, drought tolerant, tufted, bunch, medium tall to tall annual grass, adapted to most planting conditions in US. 2n = 42.
Comments: Moderately competitive to establishing perennials. Moderately palatable. Both winter and spring varieties available. Most widely cultivated temperate zone grass. 100+ varieties available. Commonly used as a nurse crop or for erosion control, but cultivated for bread flour, pastry-grade flour, Oriental-style soft noodles, and cereals.

WINTER WHEAT Fall plant, overwinters as a seedling providing winter soil stabilization. For a green manure, turn plants under before going to seed. Plant 2 lbs per 1000 ft sq. for cover crop (pots 2000).

Triticum aestivum X Elytrigia elongata REGREEN
Habitat: Best on moderately coarse to moderately fine soils, will also work on coarse and fine soils. Neutral to basic soils, some acid tolerance.
Culture: Plant 10-40 lb per acre in fall or spring (Granite).
Description: Cool-season, drought tolerant, tall. Annual or short-lived perennial bunch grass, highly adaptable.
Comments: Sterile hybrid-cross between wheat and tall wheat grass. Developed as a cover crop and soil stabilizer. Germinates and establishes readily, but plants do not persist or reseed. Good choice for short-term cover. Will be completely out-competed by more desirable species. 11,000 seeds per pound.

Triticum aestivum X Secale cereale TRITICALE
Habitat: Best on moderately coarse to moderately fine soils, will also work on coarse and fine soils. Neutral soils, some basic and acid tolerance
Culture: Plant 60-100 lb per acre in fall or spring (Granite).
Description: Cool-season, drought-tolerant, tall, annual grass, adapted to most of USA.
Comments: Hybrid-cross between common wheat and cereal rye. Extremely good forage producer and highly palatable. Desirable when maximum forage is needed while slower perennials are developing. Many spring and winter varieties available. 13,000 seeds per pound.

Triticum durum Desf. DURUM WHEAT, aka Macaroni Wheat, Hard Wheat (*durus -a -um* hard, from Latin *durūs,* hard.)
Grown as spring wheat in the Great Plains and Canada, winter wheat in Mexico. Grown for Macaroni-type pastas, semolina, bulghur, flat breads, and pita. 2n = 28.

Uniola Linnaeus **(**formerly including *Chasmanthium* Link.**) Sea Oats, Sprangle Grass, Spike Grass** New Latin, from Latin *unione glumarum*, united bracts, referring to the spikelets, alternately from Late Latin, a kind of plant, probably from *unio* oneness, unity, union. (*Unio* also means a large pearl.) x = 10.

ZIZANIA Linnaeus **Wild Rice, Canada Rice, Indian Rice, Water Rice** *Zizania* Wild Rice New Latin, from Late Latin *zizanium, zizania, -ae,* darnel, cockle, from Greek ζιζάνια, *zizania,* plural of ζιζάνιον, *zizanion*, an injurious weed growing in grain. Tall, annual and perennial, monoecious grasses of eastern North America and Asia having long flat leaves and ample panicles of one-flowered spikelets. x = 15.

In metro Chicago area restoration projects, Wild Rice is routinely included in "emergent" seed mixes and specified to be installed with a drill. It cannot succeed! It is stupid.

Zizania aquatica Linnaeus *MI, OH, PA ANNUAL WILD RICE, aka Indian Wild Rice, Wild Rice (*aquaticus -a -um* aquatic, of water, living in or growing by water; living in water, from Latin *aquaticus*, living in water, or full of water, watery, as opposed to *aquatilis*, living under water.)
Habitat: Marshes, shallow ponds, lakeshores, and slow moving stream borders in mud bottoms, shallow water. not common. Fresh water streams, lakes, ponds, sloughs with soft mud bottoms. Tidal and non-tidal marshes at least 1' deep. Waterlevel from 6" to 3'. In very clean water it may grow in up to 8 feet of water. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance none. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 6.4-7.4. Water hardness 22 to 300 ppm calcium carbonate and pH 5.0 to 8.0. distribution Rare, Cook, Lake, and Union and Whiteside counties.

Culture: Seed must be kept moist. At maturity, this species seed has over 40% moisture content and dies in a few days if air dried (Sauer 1993). Wet seed must be planted 1-3" deep, shallower in mineral soils and deeper in peat soils, and immediately flooded. Fall planting is preferred, as the seed requires 90 days of cold storage 33 to 35º F in water to break dormancy. Germination begins at 42ºF with optimum germination at 64-70ºF. Once established and a seed crop is produced, it may self-sow. **It must be sown into standing water or planted as above**. It **is really, really stupid** to include this species in mixes with orthodox seeds. Its use in Midwestern emergent seed mixes is 99% erroneous. Requires clean, very slowly moving water, with little wave action and nonfluctuating water levels. It is is of little or no value in restoration in a typical urban context.

Recommended seeding rate 50-100 lbs/acre broadcast. (Anon 1981) 2 Bushels per acre or thinner (Wildlife, 2002). 25 lb per acre in late winter in standing water (ecs). Growth rate rapid. Seedling vigor high. Vegetative spread rate none.

Description: Annual bunch grass to 10'. The species has pistillate lemma scabrous, slenderly nerved, aborted spikelets up to 1 mm broad, subulate, tapering into the awn. 6" minimum root depth. 2n = 30.

Comments: Blooms July to September. Provides food for wood ducks, black ducks, and muskrats. Waterfowl, marsh birds, shorebirds, and songbirds eat seeds. Incredibly beautiful and very interesting in flower. Difficult to establish on clay soils. It likes a soft boggy bottom and consistent water level. Flooding will kill it. Carp uproot seedlings and muskrats tear up the plants and eat the roots. There are reports of wild rice growing in intermittently flooded ditches along highways. 11,000 to 11,349 seeds per pound. One bushel of Wild Rice is approximately 25 pounds (Jim @ Wildlife Nursery personal communication)

"Commonly attributed to the county but we have not been able to find it. We know of it in Piscasaw Creek in Boone County." (Fell 1955)

A local colony between Tampico and Rockfalls in 2007 and 2008, had all plants killed by summer high water. The colony recovered from the seed bank and returned in 2009.

"The secret of creativity is knowing how to hide your sources." Albert Einstein

HYDROCHARITACEAE A. L. Jussieu 1789 **Frog's-bit Family**

ELODEA Michaux **Waterweed** *Hydrocharitaceae* From Greek *helodes*, growing in marshes. Formerly *Anacharis* Rich. Aquatic herbs.

Elodea canadensis Michaux CANADIAN WATERWEED, aka Elodea, Waterweed (of Canada or northeast USA.)
Habitat: Mud or sandy bottom in 1" to 10" of water. in sloughs or sluggish streams and lakes containing hard, clear fresh water.
Culture: Planting rate 10 bushels per acre
Description: Aquatic herb. Plants provide food and cover for wildlife. Waterfowl (esp. redheads, mallards, widgeons, scaups, coots) eat seeds and leaves. "Quick growing and carp resistant" (Anon 1981) As *A. canadensis* "Found frequently in ponds, ditches, sloughs and slow streams." (Fell 1955)

VALLISNERIA Linnaeus 1753 **Eelgrass** *Hydrocharitaceae* New Latin, from Antonio *Vallisnieri* died 1730 Italian naturalist. Submerged aquatic plants with ribbon like leaves and pistillate spathes on long finally spiral scapes.

Vallisneria americana Michaux WILD CELERY, aka Eel Grass, Water Celery, Tape Grass
Habitat: Hard, fresh, slightly brackish, fairly clear, "changing" water (not stagnant?) which could contain some lime. Prefers mud, sandy, or coarse silt bottom.
Culture: Tubers: spring plant 1000 tubers/acre at 3' intervals. Plants: spring plant, 1000 plants/acre, 3' intervals. Seeds fall plant, seeding rate 30 lbs/acre (Source????)
Description: Waterfowl eat foliage, seeds, and rootstocks. Fish eat plants and use cover. Clears and aerates water.
"Very uncommon in Killbuck Creek in Winnebago County and in Ogle County." (Fell 1955)

HYDROPHYLLACEAE R. Brown 1817 **Waterleaf Family** A family of about 18 genera and 270 species of herbs and shrubs, almost cosmopolitan but concentrated in western North America.

HYDROPHYLLUM Linnaeus **Waterleaf** *Hydrophyllaceae* A genus of about 8 species of herbs of eastern and western North America. Seeds should be refrigerated at 33-38º F until pretreated or planted.

Hydrophyllum appendciulatum Michaux BIENNIAL WATERLEAF
In order to germinate, seeds need a warm, moist period followed by a cold, moist period. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm 09). Plants biennial from a taproot. "In low damp places in the woods; it is less common than the next. (*H. virginianum*)" (Fell 1955)

Hydrophyllum virginianum Linnaeus VIRGINIA WATERLEAF, aka John's Cabbage
60 days cold moist stratification (pm 09).
Comments: Blooms 5,6. 16,000 to 69,007 seeds per pound. "Very common in damp places, usually in woods but also in the open." (Fell 1955)

HYPERICACEAE A.L. de Jussieu 1789 **St. John'swort Family**

HYPERICUM Linnaeus 1753 *Hypericaceae,* or *Guttiferae* or *Clusiaceae,* the Mangosteen family. From Greek, *hyper* above and *ekion* picture. The plant was hung above pictures or an image in the home to ward off evil spirits during the summer festival *Walpurgisnacht* (the eve of May Day), later St John's Day. Alternately New Latin, from Latin *hypericum, hypericon* a plant, St.-John's-wort, ground pine, from Greek *hyperikon, hypereikos*, a plant, St.-John's-wort, probably from *hypo-* and *ereik*, heath, heather. A genus of about 370 species of trees, shrubs, and herbs, primarily temperate. Annual and perennial herbs or shrubs that are characterized chiefly by their pentamerous and often showy yellow flowers. Common name from some species blooming on St. John's Day, June 24, a sacred day for the Templars; *Walspurgisnacht* was a night the witches were out for a sabbath, the last day of spring, April 30th.

Hypericum kalmianum KALM ST. JOHN'SWORT
Habitat: Wet meadows, moist dune swales and shores, rocky or sandy soil.
Culture: Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). No treatment. Soft wood cuttings.
Description: Yellow flowers, blooms 6-9, calcareous, shrubby species, narrow dense blue green foliage, red fall color. Sulfur yellow flowers 3/4" across. Dark tan winter seed capsules and cinnamon peeling bark. To 2.5'. Zone 3. 1,920,000 seeds per pound. Often damaged by rabbits in winter.

Hypericum pyramidatum Aiton *CT, IN. ME, MD, MS, NH, VT GREAT ST. JOHN'S WORT (pyramidal, from Latin *pyramis, pyramidis*, from Greek πυραμις, πυραμιδος, pyramid, and *-atus*, possessive, likeness.)
Habitat: Fens, wet meadows, dry mesic prairies, dry savanna, and thickets. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 5.7-7.1.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify or fall plant, light, cuttings. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description: Large showy yellow flowers, 3.0-5.0', 14"minimum root depth.
Comments: Blooms 6-8. Cut flowers, attractive dried seed heads, ethnobotanical uses, landscaping, attracts butterflies aggressive. 3,040,000 to 3,350,553 seeds per pound. This species forms buds above ground (subshrub?) that are set back by late spring prairie fires. "This we have found only on Kishwaukee River bank in the Forest Preserve. (*H. pyramidatum* Ait.)" (Fell 1955 as *H. ascyron* L.)

HYPOXIDACEAE Linnaeus 1759 **Stargrass Family**

HYPOXIS Star-grass, Star lily, Yellow stars, Yellow Star Grass, African Potato *Amaryllidaceae* or *Hypoxidaceae* From Greek *upoxus*, meaning sub acid, an old name for a plant with sour leaves, also from *hypo*, beneath and *oxys* sharp, for the base of the capsule. Small, perennial scapose herbs having numerous hairy linear leaves from a corm or short rootstock and umbellate yellow flowers with 6-parted perianth Perennial herbs. There are about 110 (90) species, mostly in the Southern Hemisphere. 41 species in sub-Saharan Africa.

Hypoxis hirsuta (Linnaeus) Coville YELLOW STAR GRASS, aka Common Goldstargrass, Stargrass, Gold Stargrass (*hirsutus -a -um* hairy for the leaves.)
Habitat: Hill prairies, dry, mesic, wet prairies, calcareous soils, bluff tops: dry open woods on acid soils.
Culture: Seed not readily available, but easy from seed by cold moist stratification. Do not over pot. Division of offsets in the summer or fall. Code B. (Cullina 2000) 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Division of offsets. *Hypoxis* has contractile roots and must be planted in loose, living soil.
Description: Villous narrow leaves and yellow umbellate flowers, seeds muricate.
Comments: 1,280,000 seeds per pound. Extremely hardy, zones 5 through 10. Rated "No Brainer" and "Idiot Proof" by some.
This plant produces a few seeds per plant per year. It is not a species for commercial restoration. "Common on low prairies and also in open woods and in sandy soil." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Coleoptera.

IRIDACEAE A. L. Jussieu 1789 **Iris Family**

IRIS Linnaeus *Iridaceae* After Greek goddess of the rainbow. Rhizomatous or bulbous perennials. Leaves ensiform. ☠

Store seeds of all species slightly moist in ziplocks under refrigeration; some species are strongly recalcitrant. Wetland species require light to germinate, but a layer of coarse sand may help. A 4-6 week soak may help remove germination inhibitors from some western species. (Deno) Other than the three species listed below, partially dried storage and cold moist stratification works. Code B or C*, (H). Easy by division in summer when new fans are putting out new roots. Iris can also be divided in spring. (Cullina 2000)

Iris cristata, I. lacustris, and *I. verna* have elaiosomes like Bloodroot and are ant dispersed. They need to be handled and planted as fresh seed (and probably *I. tenuis*). The seeds of the Japanese *Iris rossii*, native to dry sunny hillsides, are also gathered by ants.

The rootstocks contain the poisons irisin, iridin, or irisine that affect humans, cattle and hogs.

Iris brevicaulis Rafinesque *OH, TN BLUE WATER IRIS, aka Blue Iris, Lamance Iris, Leafy Blue Flag, Short-stem Iris, Zigzag Iris
Habitat: Seasonally inundated wetlands, swamps, wet meadows. Open, moist woodlands. Wet prairies, marshes, wet savannas, sunlight or shade, along ponds and stream banks, open woodlands, Illinois River Valley and southern Illinois.
Culture: Fall plant, or 120 days cold moist stratification. Best planted outdoors in the fall. (pm 09) Division of mature clumps almost anytime with care.
Description: Blue or blue-violet with yellow-white accented flowers, stems declining or erect, sharply zigzag, with a flower at every bend. Leaves basal, erect, spreading or prostrate, 1.0-1.5'. Flowers are hidden in the foliage.
Comments: Blooms 5-6. Landscaping, wetland restoration. Provides cover for fish, frogs, aquatic furbearers, waterfowl, marsh birds, and shorebirds. 5,648 to 9,265 seeds per pound. *I. brevicaulis* is an interesting iris with the flowers nested in the leaves and ribbed seedpods.

Iris cristata Aiton *MD, PA DWARF CRESTED IRIS, aka Crested Iris
Habitat: Lowland woods, usually along streams. Full sun to part shade, but will tolerate full shade.
Culture: Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)
Description: general form Pale blue, lilac or lavender iris flowers with gold crests culms flowers are on very short stems, often appearing stemless leaves foliage forms a nice ground cover in wooded areas. Will naturalize.
Comments: Blooms April-May.

Iris fulva Ker-Gawler SWAMP RED IRIS, aka Red Iris, Copper Iris (*fulvus* tawny, for the flowers)
Habitat: Swamps, usually in shallow water, blooms 5,6, partially hardy in Whiteside County.

Iris lacustris DWARF LAKE IRIS
Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)

Iris missouriensis WESTERN BLUE FLAG
Culture: Plant in late fall, or stratify 90 days and sow in spring (pots 2000). Cold moist stratify 120 days (Wade). several years to flowering from seed.
Description: Rhizomatous perennial to 2', blue-purple to lilac flowers w/ yellow-orange stripe down middle of each petal.
Comments: 20,608 seeds per pound.

Iris prismatica Pursh ex Ker-Gawler SLENDER BLUE FLAG IRIS, aka Slender Blue Iris, Slender Blue Flag
Native to the east coast.
Culture: 120 days cold moist stratification. Best planted outdoors in the fall. (pm 09)
Comments: 32,000 (pm2002) seeds per pound.

Iris pseudacorus YELLOW FLAG, aka Yellow Flag Iris, Tall Yellow Iris (false *Acorus*)
Habitat: Native to southern and western Europe.
Culture: Fall plant, bottom heat. Easy with GA3
Description/comments: Blooms 5,6. The steroidal *Iris*. A European species that is larger than our native species and is naturalizing our ditches. It is very difficult to differentiate from robust specimens of Blue Flag after blooming, and part of the Blue Flag seed trade from wild harvesters is invariably this species. Worthy of a place in someone's gardens and

pond shores if dead-headed after blooming, probably more tolerant of urban hydrology than native iris. Self sows unfortunately.

Iris setosa ARCTIC BLUE FLAG
Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)

Iris versicolor Linnaeus BLUE FLAG, WILD BLUE IRIS, aka Harelquin Blueflag, Northern Blue Flag, Poison Flag, (*versicolor* variously colored, changing color, from Latin *versicolor*, from *vers-,* participle stem of *vertĕre* to turn, change, and *color,* color.)
Habitat: Marshes, meadows, wet prairies, ditches, edges of ponds, and turfy shores. Marshes, swamps, wet meadows, along shorelines, and in forested wetlands (USDA). pH 5.0-7.0.
Culture: 120 days cold moist stratification, or best planted outdoors in the fall. (pm 09) "90 days moist stratification required for germination. Requires scarification. Field sow fall." (pn nd) 90 days cold moist stratification at 36º F (usda). 120 days cold moist stratification (pm 09).
Description: Blue flowers pollinated by bees and Diptera, fruit capsule with large seeds.
Comments: Blooms 5-6. Attracts waterfowl and small mammals. Provides food for waterfowl, marsh birds, and muskrats. 20,800 to 24,329 seeds per pound. This species has a more northern distribution then the next and local reports of this species are referred to *I. virginica shrevei*. This is *very* rare (Menard County) or non-existent in our part of the Midwest, and it is not native to northern Illinois. It is erroneously specified in Chicago plantings by dip sticks.

Iris virginica Linnaeus var. **shrevei** (Small) E. Anders. BLUE FLAG, aka Blue Flag Iris, Shreve's Iris, Virginia Blue Flag, Wild Flag
Habitat: Wet meadows, upland swamp. Prefers wet meadow zone. Seasonally flooded to ≈ 3" in. with spring high water. Will not tolerate constant inundation of 6-8". pH data not available. Nutrient load tolerance moderate. Not salt tolerant. Siltation tolerance moderate. Partial to full sun.
Culture: Use of GA3 replaces need for cold moist stratification, very favorable results (gni). Seeds require cold moist stratification for 120 days, or fall planted on top of soil, little or no cover. Removing the corky hull helps. Germinates best in warm soils. "Fall sow direct or in flats, or sow fresh seed, or cold moist treatment 120 days. scarifying/cracking hulls may help/ medium to light cover. Good to fair germination." (Dunham 1993). Best planted outdoors in the fall, or 120 days cold moist stratification. (pm 09) "90 days moist stratification required for germination. Requires scarification. Field sow fall," (pn nd). Fall plant or cold moist stratify (120), saturated soils, light, division. 99% germination in 9 days reported (USDA 1997). In mixes plant 0.06-0.25 pls lb per acre (USDA1997). Fresh or moist stored seed or rootstocks.

Seed, plugs, and bareroot stock are available from a number of sources. Bare root material and plugs should be spring planted. Bare root material may be refrigerated for a brief period prior to planting. Plant bare root material 2-3" deep or plugs at same level as they have been growing, on 1-1.5' centers. Growing points should be visible above ground. Young shoots do not tolerate flooding.
Description: Perennial emergent herb. Blue-purple flowers, 2.0-3.0'.
Comments: Blooms 5-7. Cut flowers, attractive dried seedheads, ethnobotanical uses, wetland restoration, used in upper shoreline zone and vegetated swales. Waterfowl and muskrats eat seeds. Hummingbirds have been observed feeding on nectar. Provides cover for amphibians, foraging habitat for snakes, and habitat for numerous insects. Caution!!!! ☠ Handling rhizomes may cause severe dermatitis. 12,877 to 29,009 seeds per pound.

"*I. shrevei* Small. Wild Iris Our common and only wild blue flag. Variously designated as *I. versicolor, I. virgnica* var. *shrevei*." (Fell 1955)

SISYRINCHIUM Linnaeus 1753 **Blue-eyed Grass, Irisette** *Iridaceae S. albidum* and *S. campestre* fall sow, or if you can not, try cold moist treatment and sow in early spring. Light cover. Fair germination. (Dunham 1993) (Code C, G, D Ken Schaal).

Fruits are capsules with small round seeds that ripen in summer. Harvest when the turn from greenish yellow to brown or black. When ripe the pods split open into 3 segments. Most germinate the first spring after cold moist stratification, but some germinate 2nd spring. Seedlings may bloom 1st year. Code B or C. Mature fans can be divided at any time in the summer. (Cullina 2000)

Sisyrinchium albidum Rafinesque COMMON BLUE-EYED GRASS, aka Blue-Eyed Grass
Habitat: Mesic, dry, hill, gravel, and sand prairies, open woods and fields.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil. Best planted outdoors in the fall. (pm 09) Fall plant or cold moist stratify (90), cool soils.

Description/comments: Blue to white flowers, 0.25-0.75' Blooms 4-7. Roots eaten by herbivores. Ethnobotanical uses. 348,800 seeds per pound. "Our common blue-eyed grass, often white. It blooms early in dry places as roadsides, railroads, and dry prairies." (Fell 1955)

Sisyrinchium angustifolium Mill. STOUT BLUE-EYED GRASS
60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) "The stems are more broadly winged and it is much less common than the two preceding (*S. montanum* and *S. albidum*). (*S. gramineum* Lam.)" (Fell 1955)

Sisyrinchium campestre PRAIRIE BLUE-EYED GRASS, aka Blue-Eyed Grass
Culture: Germinates second spring after fall planting (Cullina 2000). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil. Best planted outdoors in the fall. (pm 09) Variety *alba* pretreatments as per the species.
Comments: 7,568,000 seeds per pound.

JUNCACEAE A. L. de Jussieu 1789 **Rush Family**

JUNCUS Linnaeus 1753 **Rush** *Juncaceae* From Latin name for rushes and similar plants Latin *juncus*; akin to Old Norse *einir* juniper, Latin *juniperus* juniper. Similar to grasses and sedges, but with 3 petaled, lily-like flowers and numerous small seeds. Cold moist stratify or fall plant-light, with some species highly dormant, wind pollinated. Fruits are capsules with tiny seeds. Attracts ungulates. (Look out for that moose!) Rushes provide excellent nesting cover. Seeds produce mucilage when imbibing water. This can be observed in ripened, split pods on dewy mornings. C3.

Juncus are generally considered non-mycorrhizal. There are no commercial mycorrhizal inoculants that work with *Juncus*.

Juncus balticus Willdenow var. **littoralis** Englem. LAKE SHORE RUSH, aka Baltic Rush
Habitat: Pannes or shallow dune ponds and moist saline roadsides, desert to sub-alpine zones. Moderately fine to fine textured soils. Basic to neutral soils. In Washington, brackish marshes, tidal flats, and wet meadows. distribution Circumboreal species, from Alaska, all the Canadian provinces, south to Virginia, Arkansas, and northern Mexico. Cook, DeKalb, Du Page, Jo Daviess, Kankakee, Lake, LaSalle and McHenry counties.
Culture: For solid stand pasture plant 1-2 lb pls per acre in fall or spring (Granite).

With seed from Glacier National Park, seeds are soaked in water for 2 days to imbibe, placed in linen bags buried between layers of moist sphagnum peat and stratified at 35ºF for 100 days. Seeds require heat, light and high humidity for germination. Surface sow.
Description: Similar to *J. effusus*, but strongly rhizomatous, sod forming, medium to tall, 18-36"“grass-like" perennial. The rhizomes often produce straight lines of plants.
Comments: Uncommon. Saline or alkaline tolerant. Often occurs as a community dominant. Very small seeds are said to be dispersed by wind. Riparian restoration. Blooms 5-8. C3. 7,322,581 to 9,660,574 seeds per pound.

Juncus biflorus Elliott TWO-FLOWERED RUSH
Habitat: Sandy wet ground, near south end of Lake Michigan. Moist or wet meadows, shores; sandy open, usually acidic soils. distribution Occasional to common in the south ½ of Illinois.
Culture: Cold moist stratify, light. (Code C, D Ken Schaal).
Description: 2.0-3.0' key features "as opposed to *Juncus marginatus*, with which this species often occurs, is: more robust with thicker, more branched and more knotty underground stems; found in wetter places." (ilpin)

"Differs from *J. marginatus* in the inflorescence being diffuse and the heads numerous with few flowers in a head. The stamens are persistent, an easily seen characteristic. Very uncommon in shallow bogs in Rockton Township." (Fell 1955)

Juncus brachycarpus Engelm. SHORT-FRUITED RUSH
Habitat: Wet prairies, edges of sloughs, sandy swales, old fields. distribution Throughout the state except for the northwest counties.
Culture: Cold moist stratify, light. (Code C, D Ken Schaal).
Description: 2.0-3.0'. Inflorescence dischasium.
Comments: Blooms 6-8. 12,000,000 seeds per pound.

Juncus canadensis J. Gray (or J. Gay ex LaHarpe, or J. Gay) CANADIAN RUSH
Habitat: Marshy places, usually in subacid or acid soils (Fernald), Boggy sites, calcareous pond margins, bottom of wet sand quarries. Anaerobic tolerance high. CaCO3 tolerance none. Drought tolerance none. pH 4.5-5.9 distribution

Culture: Seeds cold stratified for 270 days germinated at alternating temperatures of 30º / 20ºC. Seed dormancy is physiological dormancy. (C. Baskin 2003b) 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: Bunch type rush, 12" minimum root depth.
Comments: 4,500,000 seeds per pound. "A late flowering rush that is uncommon in boggy areas in Coon Creek bottom." (Fell 1955)

Juncus dudleyi Wiegand DUDLEY'S RUSH (*dudleyi* for William Russell Dudley, 1849-1911, discovered *Juncus dudleyi.*)
Habitat: Calcareous fens, wet meadows, wet prairie, moist meadows, and agricultural wetland seedbanks. Damp to dryish calcareous soil. Old fields and pastures, degraded prairies.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: Similar to *J. effusus*, but heads are more erect. 0.5-2.0', leaves one half the stem height.
Comments: Blooms 5-7, ethnobotanical uses, wetland restoration. 11,947,368 to 64,857,141 seeds per pound. "Common on wet prairies and other low places." (Fell 1955)

Juncus effusus L. *IA COMMON RUSH, aka Soft Rush, occasionally known as Bulrush (loosely spreading, straggly, pouring forth, from Latin *effusus,* very loose spreading)
Habitat: Seasonally inundated areas, wet meadows, moist to wet habitats. Muddy shores, swales, wet thickets, bogs, and damp open ground. "Common in wet places" (Fell 1955) Marshes and prairies. Prefers a few inches of standing water to moist soil. Some wrongly say up to 12" water (USDA 1997). Tolerant of some water level fluctuations. Anaerobic tolerance medium. CaCO3 low. Drought tolerance moderate. Nutrient load tolerance moderate. Salt tolerance low. Siltation tolerance moderate. Partial to full sun. pH 5.5-7.0.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify or fall plant-light. Some say seed can be stored in fresh water or damp media @ 35-40° F For 120-270 days and spring seed. Seed may also be fall broadcast for natural stratification. Sowing seed in flats and putting flats in cold frames or cooler for 2 months works well for us. Some lots produce good crops with no treatment. Alternating temperatures and light may be necessary for, or improve germination. Seed, plugs, and bare root materials readily commercially available. Seed is small and may be difficult to distribute evenly. Some have recommended up to 0.25 pls lb per acre (USDA 1997), but 250 seeds per square foot of one species may be excessive.

Seed cold stratified for 270 days germinates at alternating temperatures of 30º/20ºC. germination is greater in light than dark. Seed dormancy is physiologic dormancy. (C. Baskin 2003c)

Plugs and bare root materials should be planted at the depth they have been growing, on 0.5-1.5' centers. Plants spread slowly.
Description: Perennial emergent herb, tufted rush with short rhizomes, 12" minimum root depth, 1.5-2.5' slender stems, green/ brown flower as if on the side of the stem.
Comments: Blooms 6-7. Ethnobotanical uses. Wetland restoration, useful in upper and lower shoreline zones and vegetated swales. Provides food and cover for songbirds and waterfowl. Seeds are eaten by song birds and waterfowl. Plants are eaten by muskrats, deer, and small rodents. Provides cover for ducks and spawning habitat for sunfish and bluegills. Provides nesting habitat for rails. Habitat for several species of insects. 12,788,732 to 60,533,331 seeds per pound.

Variety *pacificus* Fern & Weig. PACIFIC RUSH is found in moist places, below 8000 feet, from lower California to British Columbia. Using seed collected between June 1st and September 1st and stored in a refrigerator, 80% germination 30 days after sowing. (Young 2001b) Young recommends using fresh seed, as germination declines with older seed, and not drying fresh seed, refrigerate and sow ASAP. Many other varieties are known.

Juncus interior Wiegand INLAND RUSH
Habitat: Mesic prairies, railroad sidings, hill prairies.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) (Code C, D Ken Schaal).
Description: 44,800,000 seeds per pound. "Not uncommon on low prairies and occasionally on drier ones." (Fell 1955)

Juncus nodatus Coville STOUT RUSH (Latin *nōdātu*s, from *nodo*, to furnish with knots, tie in a knot)
Habitat: Low sandy flats, wet sands and ditch banks near south end of Lake Michigan.
Culture: Cold moist stratify, light (Code C, D Ken Schaal).
Comments: Blooms 7. 2.0-4.0'. 12,800,000 (gni) seeds per pound.

Juncus nodosus Linnaeus JOINT RUSH, KNOTTED RUSH (*nodosus* full of knots, knotty, gnarled, with conspicuous nodes, jointed, said of roots and stems, from *nōdōsus*, full of knots, knotty.)
Habitat: Alkaline soils, calcareous sandy or marly shores, ditches, calcareous springy areas.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy

and germinate. (pm 09)
Description/comments: 6-24". Blooms 6-8. 25,222,221 to 32,000,00 seeds per pound. "Rare. In bogs in Rockton Township, in Laona Township west of Yale bridge and in Kent Creek bottom at North Springfield avenus road." (Fell 1955)

Juncus tenuis Willdenow PATH RUSH, aka Poverty Rush, Roadside Rush, Slender Rush (*tenuis, tenue* slender, thin, fine from Latin *tenuis, tenu-,* fine, thin, slender, slim.)
Habitat: Shaded compacted paths. Wet to dry soil, compacted soil, especially along woodland paths. In Washington, habitats that are saturated in winter but dry out in summer. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance Low. Fertility requirements low. Salinity tolerance low. Shade tolerance intermediate. pH 4.5-7.0
distribution Throughout most of North America and naturalized elsewhere.
Culture: "No pretreatment considered necessary. May cold moist treat. Very light cover. Tiny seeds. Excellent germination." (mfd 1993). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Non-dormant, no pretreatments are necessary. Seed may lose viability very quickly, 2-3 years, should be stored at 40ºF and 35% humidity. (Kujawski & Davis 2001) Genesis seed test data indicates most lots greatly benefit from cold moist stratification.
Description: general form bunching rush roots 6" minimum root depth culms 0.3-2.0'.
Comments: Blooms 6,7. Tolerates foot traffic. 16,000,000 to 80,533,333 seeds per pound. "*J. macer* S. F. Gray Very common; paths, roadsides, fields and open woods. (*J. tenuis* Willd.) " (Fell 1955)

Juncus torreyi Coville *ME, MD, NJ, PA, VT TORREY'S RUSH (*torreyi* for Dr. John *Torrey*, 1796-1873, a chemist and leading American botanist and with Asa Gray, co-author of *The Flora of North America*.)
Habitat: Ditches, wide range of moist soil habits, seasonally inundated-wet meadows-upland swamp, tolerant of degraded situations. Prefers moist to saturated soils. Tolerates up to 2" of flooding for short periods. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement low. Nutrient load tolerance moderate. Salt tolerance low to none. Siltation tolerance moderate. Partial to full sun. Shade intolerant. pH 4.5-6.5.
distribution "Rather common throughout the county in wet places." (Fell 1955)
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Fall seed or cold moist stratify. Appears to self-establish naturally in constructed wetlands. Commercial availability of seed is improving. In mixes plant 0.006-0.125 pls lb per acre (USDA 1997) Moderate growth rate.
Description: general form Perennial rhizomatous herb roots 10" minimum root depth culms up to 3', 1.3-3.0' heads green to brown.
Comments: Blooms 7,8,9. Wetland restoration, strongly rhizomatous root system useful for erosion control in upper shoreline zone and vegetated swales. cool season, spreading, aggressive. Inflorescences often produce bulblets. Small plants can be confused with *J. nodosus*, but *torreyi* has petals shorter and less subulate than sepals. 25,600,000 to 50,444,443 seeds per pound.

Quando omni flunkus, mortati.

LAMIACEAE Lindley 1836 or *Labiatae* A. L. de Jussieu 1789 Mint Family A family of about 230-250 genera and 6700-7170 species of herbs, shrubs, vines, and trees.

AGASTACHE Clayton ex Grovonius 1762 **Giant Hyssop** *Lamiaceae* (From Greek *agan*, much, or very much, and *stachys*, a spike, or an ear of wheat, referring to the numerous flower spikes) A genus of about 22 species of herbs of central and east Asia and North America. Cullina 2000 code A. Seeds mature late summer to early fall.

Agastache foeniculum (Pursh.) Ktze. *IA ANISE HYSSOP, aka Wonder Honey Plant, Blue Giant Hyssop, Lavender Giant Hyssop (similar odor to fennel, or a diminutive of the Latin word *foenum*, hay, because of the hay-like smell)
Habitat: Mesic prairies and open woodlands, dry mesic to mesic prairies, prairies and savannas. Boreal forest. This is not a plant for prairie restoration in Illinois!
Culture: No pre-treatment necessary other than cold, dry stratification, or 60 days cold moist stratification. Seeds are very small or need light to naturally break dormancy and germinate. (pm 09) "10 days moist stratification improves germination, but not required, Field sow fall or spring." (Prairie Nursery, no date) No treatment, cold moist stratify may help some seed lots, division. Fresh seed germs best with GA3 and cool treatment with light. Seed cold dry stored 6 months 70 germs best at cool temperatures, then ga3, then light. (Code K or C (90 days) Heon, 1999). This is becoming a commercialized species with seed dormancy being breed out of many "commercial" types.
Description/comments: Bluish purple flowers, 2.0-4.0'. Blooms 6-9. May bloom first year from seed. Collect seeds September. Aromatic, strong anise scented leaves. Spreads aggressively from seed and may be too weedy for small gardens. Remove the seed heads before the color fades. 1,040,000 to 1,584,642 seeds per pound.

Planted by the biogeographically challenged. More of a western ornamental species, or even a boreal forest species, and not a restoration species in Illinois. This species has few records in Illinois (Mason County), with the next closest records from Dane County, Wisconsin, based on cultivated plants. Certainly not an Illinois prairie plant, perhaps justified as quick color or to economize a seed mix. Its use should be classed as an 'annual, short-lived perennial'.
Associates: Excellent bee forage. Good nectar plant. Birds are fond of seed.

Agastache nepetoides (Linnaeus) Kuntze *WI YELLOW GIANT HYSSOP, aka Catnip Giant Hyssop (*nepetoides* resembling catnip, from Latin *Nepeta,* catnip, name for an aromatic plant, and -*oides*, resembling.)
Habitat: Wet savannas, mesic woods, dry savannas, woodland edges, low woods. Dry mesic, mesic, wet mesic prairies and savannas. Open woods or hedges. Occasional.
Culture: "Cold moist treatment or fall sow. Light to very light cover. Good germination." (Dunham 1993) 60 days cold moist stratification. Seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Sow seeds outdoors in fall, or 120 days cold moist stratification (Heon et al. 1999). Cold moist stratify (120)-light / GA3-fall plant / division.
Description: general form Erect perennial, aromatic culms 3-9', stems square, branched at the top leaves opposite, simple, margins coarsely serrate, venation pinnate flowers yellow to yellow-green, 5-merous, 1/3" long, slightly irregular, not hairy; inflorescence dense whorls of flowers forming cylindrical spikes up to 8" N key features yellow to green flowers not hairy, flower spikes up to 8", leaves finely hairy beneath.
Comments: Blooms 7-9. C3. Seeds mature mid to late fall; collect seed in October. Cut flowers, attractive dried seed heads, landscaping. A towering specimen in the garden. Good bee plant. 947,848 to 1,440,000 seeds per pound.
"Common in damp places on roadsides and the edges of woods." (Fell 1955)

Agastache scrophulariaefolia (Willdenow) Kuntze PURPLE GIANT HYSSOP, aka Figwort Giant Hyssop. (with leaves of figwort, *Scrophularia*)
Habitat: Mesic and dry savannas. Edges of clearings, dry upland woods. Mesic to wet mesic. Dry to wet woods.
Culture: "Cold moist treatment or fall sow. Light to very light cover. Good germination." (Dunham 1993). 60 days cold moist stratification. Seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Sow seeds outdoors in fall, or 90 days cold moist stratification (Heon et al. 1999). Genesis seed tests indicate cold moist treatment may not be necessary. Cold moist stratify (120) or fall plant dry storage(180)70-light / GA3- / division.
Description: general form Native, erect perennial aromatic forb culms 3.0-5.0', stems square, branched towards the top leaves opposite, simple, margins serrate, mostly hairless beneath flowers white or pinkish, occasionally purple, 5-merous, 1/2" long, slightly irregular, not hairy; inflorescence dense whorls of flowers forming a 6" cylindrical spike, fruit is a one-seeded nut.
Comments: Blooms 8-10. C3. Collect seed September to October. 1,014,525 to 1,488,000 seeds per pound.
"Less common than the above (*A. nepetoides*). Roadside near Freedlund farm west of Roscoe, creek bottom in Calvin Park, East Rockford." (Fell 1955)

BLEPHILIA Rafinesque 1819 **Woodmint, Pagoda-plant** *Lamiaceae* (Greek *blepharis*, eyelash, for the resemblance of the bracts and calyx teeth). A genus of three species of herbs of eastern North America. Seeds are tiny nutlets.

Blephilia ciliata (Linnaeus) Bentham. DOWNY WOOD MINT, aka Pagoda Plant (with marginal hairs)
Habitat: Dry prairies and woods. "Common in dry woods, being more frequent than the next (*B. hirsuta*)." (Fell 1955 as *B. ciliata* (L.) Raf.)
Culture: Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) "Moist cold treatment, or fall sow. Light to very light cover. Good germination." (Dunham 1993) Seeds germinate after about 60 days of cold moist stratification (Heon et al. 1999). Moist cold stratify / fall plant. 60 days cold moist stratification.
Description/comments: Purple flowers pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, Hemiptera, 1.5-2.0' Blooms 6-7. 6,400,000 seeds per pound.

Blephilia hirsuta (Pursh) Bentham. WOODMINT (with straight hairs)
Habitat: Mesic woodland.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Seeds germinate after about 60 days of cold moist stratification (Heon et al. 1999). Moist cold stratify / fall plant.
Description/comments: White flowers. 2.0-4.0'. Blooms 6-8. Attractive dried seed heads, landscaping, aromatic. 3,736,624 to 3,840,000 seeds per pound. "Much less common, a taller plant and more likely to be in moist places; edges of woods in Kishwaukee River Forest Preserve, and south of Rock Cut." (Fell 1955)

LYCOPUS Linnaeus 1753 **Bugle-weed, Water-horehound** *Lamiaceae Lycopodium* New Latin, from *lyc-*, and *-podium,* or Greek *lykos,* wolf, and *pous, podes*, foot; for the resemblance of the branch tips to a wolf's paw**.** A genus of about 10-14 species of herbs of temperate Eurasia, North America, and Australia.

Lycopus americanus Muhlenberg ex W. Barton COMMON WATER HOREHOUND, aka American Bugleweed
Habitat: Fens, marshes, moist ground.
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Fall plant or cold moist stratify, stem cuttings.
Description: White flowers, 1.0-2.0'. Blooms 7-9. 2,080,000 to 3,691,057 seeds per pound. "Common on streambanks and in other very wet places. The incised lower leaves are distinctive." (Fell 1955)

MENTHA Linnaeus 1753 **Mint** *Lamiaceae* From the Latin name. *Mentha* a very old plant name from the Latin name, mint, from the Greek nymph *Mentha* who was turned into a plant. A genus of about 20-25 species of perennial herbs of temperate Eurasia and northern North America.

Mentha arvensis Linnaeus WILD MINT
Habitat: Marshes, agricultural and other disturbed wetlands mostly on gravels. Seedbank species in some agricultural wetlands.
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) No treatment, division, stem cuttings. There is a perpetual shortage of Wild Mint seed, with never enough to satisfy the demand.
Description/comments: White flowers, 1.0-2.0'. Blooms 7-9. Highly aromatic, often found by sense of smell before it is seen. 2,820,512 to 4,800,000 seeds per pound. "*M. canadensis* L. Mint. Common on stream banks and in other wet places. There is a marked variation in pubescence and in size and shape of the leaves. Flowers are axillary." (Fell 1955 as *M. canadensis*)

MONARDA Linnaeus 1753 **Bee Balm, Wild Bergamont, Wild Bergamot** *Lamiaceae Monarda* after Nicholas *Monardes*, 1493-1588, Spanish botanist and physician. The common name bergamot reflects the Norewgian *bergmynte*, Icelandic *bergminta*, and Finnish *mäkimeirami*, "mountain mint". Properly the common name would be bergamont, as bergamot has several other meanings, including the bitter orange (*Citrus aurantium* ssp. *bergamia*) that is the source of oil of bergamot used in Earl Grey tea. See the appendix With Mālus Toward None on CD for *pergamena, pergamonto* and *Origanum*. A genus of 12-20 species of coarse North American annual, biennial, and perennial herbs having a tubular many-nerved calyx and whorls of variously colored flowers. Fruits are nutlets. Many species, especially *M. didyma*, have cultivated forms.

Seeds ripen summer to late summer. Easy from cold moist stratified seed. Code B. 2-3 node stem cuttings root easily. Older, hollow stems will rot. Some species' cuttings will not form perennating buds. (Cullina 2000)

Monarda bradburiana Beck. BRADBURY'S MONARDA
60 days cold moist stratification (pm 09). (Code A,D Ken Schaal) 560,000 to 2,368,000 seeds per pound.

Monarda citriodora Cervantes ex Lagasca y Segura LEMON MINT, aka Lemon Monarda (*citriodorus -a -um* with a lemon smell, lemon-scented.)
Habitat: Low to moderate water requirement, full sunlight, adapted to different soil types. Moderately coarse to moderately fine soils. Neutral soils. Likes limestone soils (pots 2000).
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Easy from seed. Pure stand plant 3 lb per acre. Seed in the fall in the south and in the spring in the north (pots 2000).
Description: Western native annual, 12-36", with white to lavender flowers dotted with purple, bloom May to August, lemon scented foliage. 711,245 to 1,003,315 seeds per pound.

Monarda fistulosa Linnaeus *RI WILD BERGAMONT (*fistulosus –a -um* Tubular, dude! Hollow, pipe-like, hollow like a pipe, but closed at both ends, hollow throughout as the leaf of an onion, New Latin from *fistula*, a water-pipe; a reed-pipe, shepherd's pipe, tube, hollow reed or stalk, or Pan pipe, and *-osus*, suffix indicating notable development.)
Habitat: In most native communities, hill prairies, dry to mesic prairies, edges of woods dry thickets, clearings, and borders of woods. Roadsides, woods, dry fields and thickets. Frequent in calcareous soils. Low to moderate water requirements. Full sun to partial shade. Partial to full sun. Moderately coarse to moderately fine soils. Limited inundation tolerance. Nutrient load tolerance moderate. Siltation tolerance low to moderate. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 6.0-8.0.
Culture: Dry store seed. No treatment necessary. "Cold treatment, or no pretreatment, or fall sow. Very light to light cover. Excellent germination. " (Dunham 1993). No pre-treatment necessary other than cold, dry stratification (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall,

spring, early summer." (pn nd) Germinates best w/ light at warm temperatures. Established readily from seed. Easy from moist stratified seed, light / GA3 /no treatment-successional restoration-stem cuttings. Pure stand plant 2 lb per acre (granite). In mixes plant 0.015 to 0.125 pls lb per acre. USDA (1997) says 0.125-1.0 pls lb per acre (Yea, right). Growth rate moderate. Seedling vigor medium. Vegetative spread rate slow.

Divide mature clumps in spring before new shoots appear. Stem cuttings work well in green house.
Description: Native aromatic, perennial subshrub herb, 12-48", with lilac, pink, lavender, purple, to rarely white flowers, pollinated by long-tongued bees, short-tongued bees, Lepidoptera. 2.0-4.0'. Square stems with grey-green foliage. 4" minimum root depth.
Comments: *Monarda* is also considered invasive in some parts of the country. Blooms 6-9. Forms large colonies, landscaping, roadside plantings, cut flowers, attractive dried seed heads. Numerous ethnobotanical uses. Useful in upper slope stabilization. Palatable to herbivores in early growth stages. Attracts butterflies, honeybees, hummingbirds, and many beneficial insects. Aggressive, spreading by seed and rhizomes, young plants rapidly increasing in size, successional in restorations. Leaves are aromatic. 1,007,769 to 1,498,000 seeds per pound.

"A very common roadside weed which grows also to some extent in thin woods. In 1945 the white form was common over the county but we have seen little of it since. The offspring of white plants that we transplanted to our garden had lilac colored flowers. (*M. fistulosa* var. *mollis* (L.) Benth.)" (Fell 1955)

An involved species, widely distributed with subspecies and varieties, and opinions there of. A lemon-scented variation, *Wahpe Washtemna*, is sold by Prairie Moon. A few plants of this variation were found in a remnant in Lee County, Illinois, about 1 mile east of County Line (Foley) Prairie and ¼ mile north of where Ed Foley's house used to be (east side of blacktop).

Monarda punctata Linnaeus **villicaulis** (Penell) Shinners *KY, OH, PA DOTTED HORSE MINT, SPOTTED BEE BALM (*punctata* spotted, from Latin *punctum*, something that is pricked; a puncture; a small spot; a small portion, -*atus*, possessive or likeness.) (hairy stem, *villus*, a tuft of shaggy hair or wool, -*i*-, and *caulis*, from the Greek καυλος, *kaulos*, the stem of a plant.)
Habitat: Disturbed dry sands. Full sun. distribution Absent from parts of the Ohio River Drainage.
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd)
Description: Annual, biennial, or perennial forb. 1.0-2.0'. Pale yellow flowers dotted with purple, and white, pink, or lavender bracts. Flowers are terminal and axillary.
Comments: Blooms 7-10. Biennial. Landscaping, attracts butterflies and hummingbirds. Can be aggressive on open sands. 1,440,000 to 1,621,428 seeds per pound.

PHYSOSTEGIA Benthham 1829 **False Dragon Head, Obedient Plant, aka Lionsheart** *Lamiaceae* New Latin from Greek *physa, phusa,* a pair of bellows, bladder (*also wind in the body, breaking of wind*) and *stege* covering, roof, New Latin -*ia*; akin to Greek *stegein* to cover, or shelter, from *stegos,* roof, for the inflated calyx covering the fruit. A genus of about 12 species of North American perennial herbs having sessile linear to oblong leaves and showy white, rose, or lavender flowers with an inflated 5-toothed calyx. Fruits are nutlets.

Easy from cold moist stratified seed. Code B. Easy by division or 3 node softwood cuttings. (Cullina 2000)

Physostegia angustifolia Narrow-leaved Obedient Plant. 60 days cold moist stratification (pm 09).

Physostegia parviflora Western obedient Plant. 60 days cold moist stratification (pm 09).

Physostegia virginiana (Linnaeus) Benth. *VT FALSE DRAGON HEAD, aka Obedient Plant, Obedience, Virginia False Dragonhead (of Virginia.)
Habitat: Hill, sand, dry, mesic, and wet prairies.
Culture: "30 days moist stratification required for germination. Field sow fall." (pn nd) Easy from seed and spot planting. Cold moist stratify 60 days (Wade nd)
Description: Rhizomatous perennial, pink or rose flowers, 2-4'.
Comments: Blooms 6-8. Pollinated by birds, long-tongued bees, Lepidoptera. Flower heads can be turned and positioned. 236,992 to 252,503 seeds per pound.

"Less common than the preceding (var. *speciosa*) preferring prairie soil of a rather dry type. Charles street road west of Cherry Valley, the C. & N.W. Ry. east of Winnebago. It also is used as a garden plant. (*P. angustifolia* Fern.)" (Fell 1955)

"Although to be expected in Henry County as an escape, all of my specimens have been found in cultivation." (Dobbs 1963)

Physostegia virginiana (Linnaeus) Benth. **arenaria** Shimek PRAIRIE OBEDIENT PLANT (relating to sand, *arena*, noun, sand; slime, mud, *arius*, adjective suffix for nouns or numbers: connected to or possessed by.)

Habitat: Mesic to dry prairies and savannas, cracks of bare limestone, shallow prairie soil over bedrock, very moist prairies.
Description: Flowers 7-9. Not well represented in the seed trade. 400,000 seeds per pound.

Physostegia virginiana (Linnaeus) Bentham var. **speciosa** (Sweet) Gray SHOWY FALSE DRAGONHEAD [facw]
Habitat: Wet meadows and wet savannas.
Culture: "Cold moist treatment, or fall sow. Light cover. Variable good to fair germination." (Dunham 1993). Cold moist stratify or fall plant, cuttings, division. Seed has a fair degree of dormancy and may show in plantings years later.
Description/comments: Pink flowers, 2.0-4.0', blooms 8-9. Cut flowers, landscaping, attracts hummingbirds aggressive, rhizomatous. 288,000 to 279,729 seeds per pound.

"Common in wet places, stream banks, low prairies and marshes. Slough west of Shirland, Kent Creek west of Rockford, Rock River bank at Rockford, etc. Used to some extent as a perennial garden plant. (*P. virginiana* var. *speciosa* (Sweet) Gray.)" (Fell 1955)

PYCNANTHEMUM Michaux 1803 **Mountain Mint, Wild Basil** *Lamiaceae* Densely flowered, New Latin, from Greek πυκνος, *pycnos*, dense and *anthemon*, flower. A complex and difficult genus of 20-25 species of herbs of temperate North America. Species have evolved by allopolyploidy, autoploidy, and aneuploidy. Numerous sterile hybrids and aberrant forms complicate the understanding of species and their identification. (Weakley 2007) C3.

Genus needs light to germinate, most are easy from seed, cuttings, division, attracts butterflies.

Seeds ripen late summer. Easy by cold moist stratification. Code B. 2-node stem cuttings root easy, but may not overwinter. (Cullina 2000)

Pycnanthemum pilosum Nuttall HAIRY MOUNTAIN MINT
Habitat: Dry savannas "Uncommon in thickets and on low prairies as on the C.B. & Q. R.R. near the Winnebago-Ogle County line." (Fell 1955)
Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) GA3 / light, fall plant or cold moist stratify (90). Genesis preliminary data indicates some lots benefit from cold moist stratification (58 germ, 38 dorm).
Description: The small white flowers with purple spots are large compared to other mountain mints. 2.0-5.0'
Comments: Blooms 7-9 Cut flowers, attractive dried seed heads, landscaping. 3,024,000 to 3,896,994 seeds per pound. Some seed lots may be double dormant.

Pycnanthemum tenuifolium Schrad. SLENDER MOUNTIAN MINT
Habitat: Local in prairies, degraded sandy areas, loamy prairies (Swink & Wilhelm 1994). Dry upland woods and dry prairies (Freck.). "Moist to slightly dry black soil prairies, moist meadows and gravelly areas along rivers, openings in woodlands, moist thickets, acid gravel seeps, limestone glades, and abandoned fields" (Hilty). Wet meadows, mesic and dry prairies. Common in pastures and on prairies." (Fell 1955)
Culture: No treatment (Code A, D Ken Schaal) No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: White flowers, 1.5-3.0'. Plant is hairless and lacks a mint odor.
Comments: Blooms 6-8. Cut flowers, attractive dried seed heads, landscaping, aggressive. 6,000,000 to 9,408,000 seeds per pound. A diploid and tetraploid species n = 20 and 40. The southeastern *P. flexuosum* has n = 18.

"*P. flexuosum* (Walt.) BSP. Much less frequent than *P. virginianum* being common only in the low sandy prairies in Coon Creek bottom." (Fell 1955 as *P. flexuosum*)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, Hemiptera.

Pycnanthemum virginianum (Linnaeus) T. Durand and B.D. Jackson (Macm) or (L.) T. Dur. & B.D. Jackson ex B.L. Robins. & Fern. *NH COMMON MOUNTAIN MINT, aka Basil, Mountain Mint, Virginia Thyme
Habitat: Occurs in most grassy open communities, hill, dry, mesic, and wet prairies and savannas, gravelly shores, meadows, dry to wet thickets, etc. Prefers moist to saturated soils in sedge meadows, wet prairies, and mesic prairies. Tolerates flooding early in the growing season only. pH 5-7. Nutrient load tolerance moderate, not salt tolerant, siltation tolerance low to moderate. Full sun.
Culture: "No pretreatment needed, or fall sow. May be cold moist treated. Very light to light cover. Excellent germination." (Dunham, 1993). No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Easily established from seed in plantings. In mixes plant 0.015 to 0.06 lb pls per acre (USDA 1997). Works well by successional restoration.

Stem cuttings in late spring, early summer, division in spring. Plants can be pinched back in early summer for a bushier habit.

Description: Perennial herb, 1.5-3.0', flowers white with purple spots. Tetraploid species n = 40.
Comments: Blooms 7-9. C3. Cut flowers, attractive dried seed heads, landscaping. Slowly stoloniferous, helps soil stability, upper shorelines, prairie buffers, and vegetated swales. Calcareous, aggressive, fragrant. 3,520,000 to 5,404,761 seeds per pound.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera. Attracts butterflies.

SCUTELLARIA Linnaeus 1753 **Skullcap** *Lamiaceae* New Latin from Latin *scutella,* a small dish, tray, platter, or drinking bowl and *-aria*, from the appearance of the calyx (sepals) in fruit. Genus of about 350-360 species of almost cosmopolitan herbs and shrubs. For those blessed with an agricultural or rural background, skullcaps are recognizable by an a "antique tractor seat"-shaped protuberance on the upper calyx (Weakley 2007). Go Angela. C3

Seeds ripen early to late summer, and are quickly shed when ripe. Capsules have 1-2 seeds each, and should be picked when the capsules yellow. The plants bloom sequentially, and may have blossoms, ripe fruit, and empty capsules at the same time. Germinates easily after cold moist stratification, often blooming first year. Code B. Spring cuttings will root somewhat. (Cullina 2000)

Scutellaria epilobiifolia Muhl. MARSH SKULLCAP, aka Small Skullcap
Habitat: Wet to moist woods, shores and shallow water. Wet meadows and marshes.
Culture: No treatment, light.
Description: general form Native erect perennial, aromatic culms 6-32 (48)" tall, stems square, weak leaves opposite, usually 2 to 4 times as long as wide, barely stalked flowers blue with white marks, 5-merous, 1/2"-3/4" long; mostly solitary flowers from the axils of the leaves, fruit is a one seeded nutlet key features Mostly solitary flowers, leaves barely stalked.
Comments: Blooms 6-9. C3. Ethnobotanical uses, wetland restoration, rhizomatous. 2,000,000 to 2,268,000 seeds per pound. Early successional or a wetland seed-bank species in our area.

"Not uncommon in wet places. Campbell Bog in Rockton Township and Kent Creek west of Leving's Park." (Fell 1955.

"*S. epilobifolia* A. Hamilton (*S. galericulata* of American authors, not L.) Marsh Skullcap.

In situations similar to the preceding (*S. lateriflora*), but much less frequency and with few plants at a station. Section 14, Geneseo Township; Section 10, Alba Township; Section 11, Colona Township; Section 1, Hanna township." (Dobbs 1963)

Scutellaria lateriflora Linnaeus MAD DOG SKULLCAP, aka Blue Skullcap. (*lateriflorus -a -um* with flowers on the side, lateral-flowered)
Habitat: Marshes, drainage ditches.
Culture: 60 days cold moist stratification (pm 09). No treatment, but cold moist treatment provides increased and more uniform germination.
Description: general form native erect perennial, aromatic culms 12-28" tall leaves opposite, stalked, thin with pinnately-arranged veins, wide rounded base, toothed flowers blue, 5-merous, 1/4"-1/3" long, petals nearly straight; inflorescence a 1"-4" long raceme of stalked flowers mostly from the leaf axils; fruit is a one-seeded nutlet key features 1-4" long axillary racemes, leaves stalked.
Comments: Blooms 6-9. C3. 1,082,241 seeds per pound. "Common in wet places as sloughs, shallow bogs, and the edge of streams." (Fell 1955).
Associates: Seed has some food value to pheasants. The plant has been used as a nerve remedy and a tonic.

Scutellaria leonardii Epling GLADE SKULLCAP, aka Leonard's Skullcap, Shale-barren Skullcap, Smooth Small Skullcap. The specific epithet is sometimes spelled with one *i.*
Habitat: Dry rocky woods and dry prairies, does not like grassy competition.
Culture: Cold moist stratify. 60 days cold moist stratification (pm 09).
Description: general form Native erect perennial culms 3-8" tall leaves opposite, simple, entire, main leaves stalkless, usually with 2 pairs of side veins flowers blue to pink, 5-merous, 1/4"-1/3' long, fruit is a one-seeded nutlet key features Species is pubescent, hairs without glands (ilpin). Leaves with 2 pairs of side veins.
Comments: Status phenology Blooms 5-7. C3. "Common on gravel ridges, open woods, etc. (*S. parvula* var. *leonardi* (Epling) Fern.)" (Fell 1955)

Scutellaria ovata Hill var. **versicolor** (Nuttall) Fernald HEART-LEAVED SKULLCAP
Habitat: Mesic savannas and woodlands, rocky woods, rich woods. Dry woods and forests.
Culture: Cold moist stratify. 60 days cold moist stratification (pm 09).
Description: general form Erect perennial, aromatic roots spreads by runners culms 0.5-1.0' (taller than 25 mm), stems square, with spreading glandular hairs leaves opposite, long-stalked, round to oval, margins serrate, crenate, venation pinnate flowers blue, uppermost bracts shorter than the calyx, 5-merous, ½"-1" long; inflorescence of stalked flowers in 1 or more terminal racemes up to 4" tall; fruit a one-seeded nutlet key features stems with spreading glandular hairs; flowers in terminal clusters, leaves long stalked.

Comments: Blooms 6-7. C3. 648,000 seeds per pound. "Uncommon in woods, usually in moist places. Mulford woods, Kishwaukee River Forest Preserve, and Alpine Park east of Rockford." (Fell 1955 as *S. ovata* Hill)

STACHYS Linnaeus 1753 **Hedge Nettle** *Lamiaceae* Greek *stachys* a spike. Genus of about 300 species of herbs and shrubs, mainly temperate, almost worldwide except Australia and New Zealand.

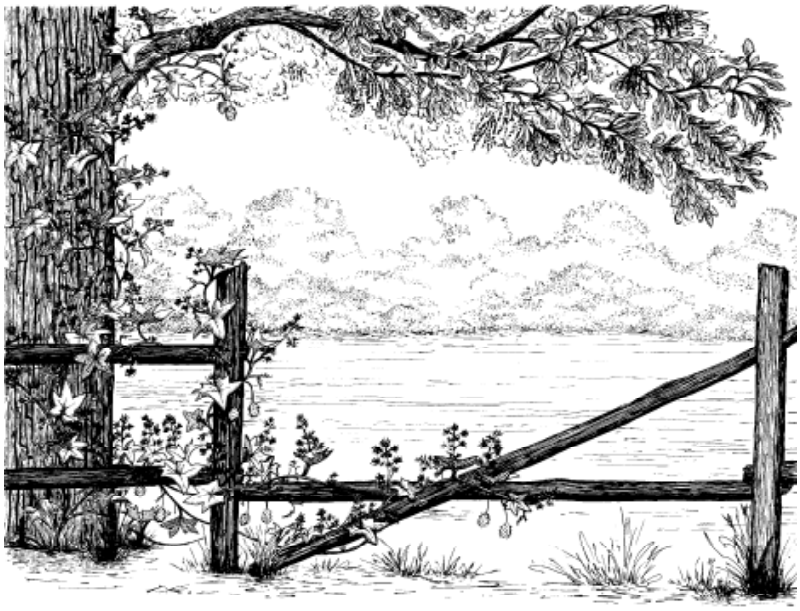
Stachys palustris Linnaeus WOUNDWORT, Hedge-Nettle
Habitat: Var. *homotricha* wet prairies, swampy and marshy soils, occasional to common in north 1/2 of Illinois, uncommon elsewhere.
Culture: 60 days cold moist stratification (pm 09).
Description/comments: "*Stachys arenicola* Britt. The most common species and the first to flower. Roadside ditches and other moist places. (*S. palustris* L. var. *homotricha* Fern.)" (Fell 1955 as *S. arenicola*)

Stachys tenuifolia Willdenow SMOOTH HEDGE NETTLE
Habitat: Floodplains and wet meadows.
Culture: Fall plant or cold moist stratify, division, cuttings.
Description: White to pink flowers, 1.0-2.0', blooms 8,9. "Less common than the above (*S. hispida*) and found in the same places; prairie sloughs east of Rockford and hall Creek at the "dells"." (Fell 1955)

Stachys tenuifolia Willdenow var. **hispida** MARSH HEDGE NETTLE
Habitat: Floodplains and wet meadows.
Culture: Fall plant or cold moist stratify, division, cuttings.
Description: White to pink flowers, 1.0-2.0', blooms 6-9.

TEUCRIUM Linnaeus 1753 **Germander** *Lamiaceae* From Greek *teukrion.* A genus of about 100-250 species of herbs and shrubs, nearly cosmopolitan.

Teucrium canadense Linnaeus GERMANDER, aka Canada Germander, Wood Sage (of Canada or northeast USA)
Habitat: Wooded floodplains, dry prairies, mesic and dry savannas.
Culture: 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify, division, cuttings.
Description: Pink flowers 0.75-2.0' Blooms 6,7,8,9. Aggressively rhizomatous. 204,288 to 312,000 seeds per pound.
"*T. canadense* L. Wood-sage. Common in damp places in woods, on railroads, roadsides and low prairies. (Var. *virginicum* (L.) Eat.)" (Fell 1955)
"*T. occidentalis* Gray. Less common than the above; a smaller plant with smaller flowers. Usually on low prairies but also in other damp places as roadsides and streambanks." (Fell 1955)



LEGUMINOSAE A.L. de Jussieu 1789 or *Fabaceae* Lindley 1836
In the broad sense, a family of about 730 genera and 20,000 species of trees, shrubs, and herbs, cosmopolitan.

CAESALPINIACEAE **Senna** from *Caesalpinia*, New Latin, from Andrea Cesalpino (*Andreas Caesalpinus*) died 1603 Italian botanist, and New Latin *–ia*. *Caesalpinia* is a genus of usually small spiny tropical trees having evenly bipinnate leaves and small whitish-green, yellow, or reddish flowers in showy racemes. Mainly trees of the moist tropics, flowers zygomorphic, but variable, nodulation rare, nodules with primitive structure.

CERCIS Linnaeus **Red Bud** *Caesalpiniaceae* *Cercis* New Latin, from the classical Greek, *kerkis*, a horn, the name for Judas tree, also the weaver's shuttle, perhaps from *kerkos* tail, from the movement of its leaves in the wind. A small genus of widely distributed deciduous shrubs or low trees, of north temperate areas, having irregular pink to reddish or white flowers borne on the old wood.

Cercis canadensis Linnaeus EASTERN REDBUD, aka American Red Bud, Redbud, Judas Tree (of or from Canada or NE USA.)
Habitat: Rich woods, ravines, fencerows. Northern Illinois is on the north edge of its range; it is important to plant northern origin stock. It is introduced in Wisconsin.
Description: Medium size understory tree to 35', prefers alkaline soil, heart shaped leaves and purple pink flowers along branches, seed pods persisting into winter, bark on older trees cinnamon red, leaves yellow fall color. 16,384 seeds per pound. In northwest Illinois, Red Bud survives better in ubran areas than in rural areas.
Associates: Redbud flowers are a nectar source for the Pipevine Swallowtail, *Battus philenor*. Songbirds eat the seeds. Beavers eat the bark.

CASSIA Partridge-pea, Senna, Sicklepod, Wild Coffee, Coffeeweed *Caesalpiniaceae* From Latin *casia, cassia*, from Greek *kasia, kassia*, a name for this species or a related genus of Semitic origin; akin to Hebrew *qesiah* cassia. Herbs, tender shrubs, and trees that are native to warm regions, having even-pinnate leaves sometimes much reduced and nearly regular flowers with calyx teeth equal and usually longer than the corolla. Seeds ripen in late summer, early fall. Some species explosively dehisce when ripe and must be harvested when the pods yellow. One species splits open and gradually looses seed, while the pods of another species remain intact through the winter, into the next year. 10 days cold moist stratification greatly improves greenhouse germination, but is not absolutely required. Scarification is required. The perennial species develop heavy root systems and should not remain in a pot for extended periods. Field sow fall, spring, early summer. Code B, I. (Cullina 2000)

This genus is often split into *Senna* P. Miller and *Chamaecrista* (Linnaeus) Moench. In Illinois native species, rare weeds notwithstanding, this separation coincides with perennials and annuals.

C. covesii, and *C. roemeriana*, nick seed coat with file or needle and soak seed for 6-8 hrs and sow in spring (pots 2000). Woody *Cassia* species may be host to ectomycorrhiza. Midwestern perennial species may be placed in the genus *Senna* P. Mill. *Senna* is New Latin from the Arabic *Sana*.

Cassia fasciculata Michaux *MA (in part) PARTRIDGE PEA, aka Golden Cassia, Locust Weed, Prairie-Senna, Showy Partridgepea, Sleeping Plant (Latin *fasciculata*, banded, bundled, of bundles, from *fasiculus*, bundle, packet, and *–atus*, possessive of or likeness.)
Habitat: Mesic, dry, and sand prairies. Tolerates poor soils and drought. Used on banks, sloped and rocky areas. Fields, meadows, roadsides, railroad cinders, prairies, disturbed ground. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 6.5-7.5.
distribution "Common in Sugar River sand area and in a sandy place west of New Milford on Kishwaukee River." (Fell 1955)
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) Plant in early spring or late fall. "Recommended seeding rate 15-25 lbs./acre" (Anon, 1981). Easy to establish on disturb ed sites. Self-sows. In monocultures plant 8 oz. per 1,000 sq. ft. (Stock). Growth rate rapid. Seedling vigor high. Vegetative spread rate none.
Description: general form Reseeding erect annual, 4" to 36", with fine hairs roots 14" minimum root depth. culms leaves alternate, pinnately-divided into 5-18 pair of leaflets flowers yellow, 5-merous, 1/2"-3/4" wide, petals mostly equal, 4 with red at the base and 10 very unequal stamens; inflorescence a 1"-6", leafy cluster or raceme of stalked flowers; fruit is a flat, straight, pod readily opening when mature key features petals almost equal, pod is flat, readily opening when ripe.
Comments: This plant is considered invasive in some parts of the United States. Blooms 7-9. Warm-season forb with showy yellow flowers. Attractive dried seed heads, landscaping, seeds are in pea-like pods. This species can be aggressive in restorations, do not overuse. Good for soil building and roadside plantings. 43,200 to 67,249 seeds per pound.
Associates: Attracts bees, good honey plant with nectaries available before it flowers. Said to be good wildlife food, attracts upland game birds and songbirds, nutritious seeds, food and cover for upland game birds. It is rated low to moderate food value for upland birds, and minor to low food values for large mammals. Its value for cover is minor.

Cassia hebecarpa Fernald *CT, MA, NH, RI, VT WILD SENNA, aka American Wild Sensitive-Plant, Northern Wild Senna *(hebecarpus*, fuzzy fruited, from Greek *hebe*, youth, manhood, and *carpos*, fruit, and *–us*, Latinizing suffix.)
Habitat: Alluvial communities, fens, and floodplains. Full to partial sun. Mesic to moist soils, open woods, roadsides, streambanks. "Found sparingly in Sugar River bottom at Yale bridge and in Kishwaukee bottom near the mouth of the river." (Fell 1955)
Culture: "Firmly scarify seed then inoculate (with Cowpea type inocula), or fall sow. Some suggest to cold moist stratify the seed after scarification. Medium to light cover." (mfd 1993) Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: general form Erect perennial 2-6' tall culms mostly smooth above leaves evenly once pinnately-divided into 6-10 pairs, stalks usually with a large club- to ovate-shaped gland flowers yellow, 5-merous, 3/4"-1 1/4" wide, stalked, petals slightly unequal, buds nodding; inflorescence several, many-flowered clusters (panicle) at the end of the stems; pod not as flat or explosively opening when mature as in the annual species, space around the seeds nearly square; seeds flat, nearly as long as wide key features Petals slightly unequal; inflorescence a terminal panicle; seeds flat, squarish; leaf stalks with club- to ovate-shaped gland.
Comments: Blooms 7-8. 22,400 to 26,536 seeds per pound. Clusters of showy yellow flowers with chocolate anthers, more attractive in bloom than the next species. Contrary to the Robert W. Freckmann Herbarium website, the pods are not very flat and tend to split when ripe, but not to the extent of *C. fasciculata*. Seeds are squarish.

Cassia marilandica Linnaeus *WI MARYLAND SENNA, aka Southern Wild Senna (of Maryland.)
Habitat: Woodland edges, fens, and streamsides. Tolerant of coarse and medium textured soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 4.0-7.0.
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) Growth rate rapid. Seedling vigor high. Vegetative spread rate none.
Description: Subshrub, erect perennial forb, 3.0-6.0' Clusters of showy yellow flowers with chocolate anthers. "Pods with seeds about 2 times as wide (???) as long." (wisplants.uwsp.edu) Pods do not split when ripe, and may remain on old stalks into the following year. Seeds are tear-shaped. 12" minimum root depth. Leaves pinnately divided into usually 4-8 pairs of leaflets.
Comments: Blooms 7,8 Attractive dried seed heads, non-nodulating? Our most common Senna. 20,000 to 27,200 seeds per pound.

CHAMAECRISTA Moench *Caesalpiniaceae* A genus of about 265 species of shrubs and herbs mostly of tropics and warm temperate areas. (*Chamaecrista* low crest) See *Cassia.*

GLEDITSIA Linnaeus *Caesalpiniaceae* (*Gleditsia* After J. Gottlieb *Gleditsch* (died 1786) German botanist and contemporary of Linnaeus.**)** Deciduous trees.

Gleditsia triacanthos Linnaeus HONEY LOCUST, aka Honeyshuck (*triacanthos* three spined, from *tri,* three, and *acantha,* thorn, thistle.)
Moist, wooded ravines, thickets, edges of fields. Banks of drainage ditches. Native tree "A common native tree that was formerly used in hedge making. One half mile west of New Milford is such a large old hedge." (Fell 1955)

GYMNOCLADUS Lamark Kentucky Coffee-tree *Caesalpiniaceae* After Greek *gymnos*, naked, and *klados*, a branch, referring to the deciduous nature. This is perhaps a reference to the primitive, open branch structure or the manner in which the leaflets fall leaving the yellow "stems" of the bipinnate leaves intact for a period in early autumn. A genus of 5 species of deciduous trees, 1 in eastern North America and 4 species in eastern Asia.

Gymnocladus dioica (Linnaeus) K. Koch. *WI KENTUCKY COFFEETREE, Coffeebean Tree (*dioicus –a -um* two houses, dioecious, indicating that the male and female flowers are found on different plants.)
Habitat: Bottomland woods. Optimum pH 7.0. Adaptable to various soils fairly drought tolerant, tolerates shade.
Description: Medium to large (60 to 85') coarse branched tree, twice compound leaves, fragrant white flowers in May, very lacy texture when in leaf, unique flaky plates on bark. Female trees have 4-8" thick black to reddish brown pods which hang thru winter. Fall color golden yellow. Zone 3. Settlers used the large beans as a coffee substitute.
"There are occasional trees in Pecatonica River bottom near Trask Bridge and in Kishwaukee River Gorge at Camp Hillcrest above new Milford. Reproduction is very slight, only a few pods being seen on a number of trees. Also occasional in Boone County." (Fell 1955)

FABACEAE Bean, Pea New Latin, from *Faba*, type genus, Latin for bean, from Greek *phakos* lentil and *-aceae*. A large nearly cosmopolitan family that comprises the peas, beans, and related herbaceous or woody plants with pea-like flowers and a legume as fruit and that is usually included in the family Leguminosae.

AMORPHA Linnaeus *Fabaceae* New Latin, from Greek *amorphe*, feminine of *amorphos*, shapeless, deformed, formless, applied to the abnormal flowers, for the flower of *Amorpha* consists only of one petal, the standard. The other four typical legume petals are missing. American herbs or shrubs with odd-pinnate leaves and purplish spicate flowers, the corolla being reduced to one petal. The other four typical legume petals are missing.

Amorpha canescens Pursh * MI LEAD PLANT (gray (or white) and somewhat hairy, gray-pubescent, New Latin *canescens* gray, grayed, or hoary, from, *canescens, canescent*, from *canesco*, to become white or gray, for the grayish-pubescent leaves.) Common name from the lead gray color of the hairy leaves.
Habitat: Mesic, dry, sand, hill, and gravel prairies, oak savanna, open woodlands; prairies, rocky wooded bluffs. "Common on dry prairies and in sandy places." (Fell 1955)
Culture:. "Very gently scarify seed, then inoculate with Amorpha Spec. 1, or fall sow. Sometimes suggested to cold moist treat seed for 10 days after scarification, but in her experience this is not necessary. Light cover. Watch for damping off. Good germination, development can be slow." (Dunham 1993). Seeds must be hulled. 10 days cold moist stratification (pm 09). "10 days moist stratification recommended, but not necessary. Field sow spring, early summer." (pn nd) Hulling and scarifying are most important before other treatments, inoculate, and cold moist stratify(10) or fall plant. Easy from scarified or moist stratified seed, bottom heat 76°F. gives immediate and dramatic results. Stem cuttings. Sowing fresh seed reported to give some results. Acid scarification (10-15 min) can be used for large lots, but this is not for the meek and timid. Transplants easily, spreads easily by seeds, few problems. Requires scarification. Successional restoration
Description: general form Erect perennial 8" to 40" (48") tall shrub (woody undershrub), nitrogen fixing roots deep taproot culms stems branched, spreading leaves pinnately-divided into 13-20 pairs of dense, silvery leaflets, blackening when dried flowers small purple, 5-merous, 1/4" long, stamens bright orange, yellow anthers, only 1 petal; flowers perfect; inflorescence 2"-6", spike-like clusters (racemes) in groups of 5-20 mostly at the ends of the stem; fruits are oblong, curved, small, hairy, hard pod (a one-seeded legume) 3/8" long with 1-2 seeds N key features Flowers purple, stamens bright orange, leaflets silvery-hairy.
Comments: Status Special concern in Michigan. phenology Blooms 6,7,8. Attractive spikes of purple and gold flowers with hairy "lead gray "-green compound leaves. Cut flowers, landscaping. 147,811 to 374,279 seeds per pound.
Associates: Attracts butterflies, butterfly larvae, bees, songbirds, upland game birds, small mammals, contributes to overall diversity for wildlife, but of intermediate value to wildlife. Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, and Diptera. Leadplant is the larval host for the Dog Face butterfly.

Amorpha fruticosa Linnaeus INDIGO BUSH, aka Desert False Indigo, Desert Indigo-bush, False or Bastard Indigo, False Indigo Bush, Indigobush, Indigobush Amorpha, River-locust, Tall Indigo Bush (*fruticosus -a -um* shrubby, bushy, from Latin *fruticosus*, bushy, shrubby, from *frutex*, a shrub.)
Habitat: Wet meadows, fens, river bottoms, floodplain, and moist soil, along rocky streams, riverbanks, thickets; stream banks, ditch-banks, and moist soils. Tolerant of coarse, medium, and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance none. Fertility requirement low. Salinity tolerance medium. Shade intolerant. pH 5.0-8.5. distribution: "Occasional in damp soil, mostly on steam banks. Rock River near Rockford College, Kishwaukee River in the gorge above new Milford, Killbuck Creek near U.S. Rt. No. 51 and Coon Creek and Sugar River near the Illinois-Wisconsin line." (Fell 1955)
Culture: 10 days cold moist stratification (pm 09). Scarify or hot water treat and soak for 12 hours-fall plant, (cold treatment gives poor results) inoculate-cuttings. Acid scarification (10-15 min) can be used for large lots. Transplants easily, spreads moderately by seed. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description: Small tree or multi-stem branching shrub, 6 -12 (15)', flowers perfect, scented, small purple 5-merous flowers with gold anthers.
Comments: Blooms 6-8. Seeds persist into fall and winter. Landscaping, wetland restoration. Fruits are a small, single-seeded pods, 1/3-1/2" long with resinous dots. 59,200 to 77,000 seeds per pound.
The plant has resinous pustules on the seedpods that contain the toxin amorpha (a rotenoid), a contact and stomachic insecticide (and piscicide), which also act as an insect repellent (Huxley 1992)
Associates: Pollinated by long-tongued bees and short-tongued bees. Attracts marsh birds, shorebirds, and small mammals. Rabbits will girdle shoots in winter, the bark seems to be standard winter fare. Considered of intermediate wildlife value. Rust can defoliate plants, other minor problems.

ASTRAGALUS Linnaeus **Milk vetch, Goats-thorn, Locoweed, Poison-vetch** *Fabaceae Astragalus* Old Greek αστραγαλος, *astragalos*, name for another legume, possibly *Orobus niger,* a milk vetch, one of the vertebrae, as also of talus bone of the ankle. Also New Latin, from Latin, from Greek *astragalos* neck vertebra, ankle joint, or milk vetch, from the vertebra-like, spinal-columnal appearance of the flower clusters. Also said to be a name applied to some plants in this genus because of the shape of the seed; the name can also mean star or milk. Approximately 2,000 species of herbs and shrubs. The genus is most diverse in the arid regions of western North America and western and central Asia. *Astragalus* species are larval hosts of Case-bearer moths of the genus *Coleophora*. The larvae initially feed internally on the seeds, flowers or leaves of the host plant but when larger they feed externally and construct

distinctive protective silken cases.

Dry seed stored in a refrigerator retains viability for years. Scarify seed. Seedlings quickly form taproot. Code A, I. (Cullina 2000)

Astragalus canadensis Linnaeus *MI CANADIAN MILK VETCH (of or from Canada or NE USA.)
Habitat: Dry, sandy prairies and dry savanna. Tolerant of medium textured soils. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 6.0-8.0.
Culture: "Scarify seed then inoculate with *Astragalus* spec. 1, or fall sow. It is sometimes suggested to cold moist treat seeds for 10 days after scarification, but in my experience this has not been necessary. Light to medium cover. Watch damping off. Good germination." (mfd 1993). Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) 10 days moist stratification improves greenhouse germination, but not necessary. Field sow fall, spring, early summer. (pn nd) Scarify, cold moist stratify (10) or fall plant, and inoculate. Growth rate moderate. Seedling vigor medium. Vegetative spread rate slow.
Description: general form Native erect perennial, 1.0-4.0' roots 10" minimum root depth culms stems usually with several branches leaves pinnately-divided into an odd number of leaflets (15-35) flowers yellow, 5-merous; 1/2" long, stalked; inflorescence a dense, tall, long-stalked, spike-like raceme held above the upper leaves fruits are many, crowded, erect, inflated, 2-chambered pods key features Inflorescence is a raceme held above the upper leaves 15-35 oddly pinnate leaflets.
Comments: Status Threatened in Michigan. phenology Blooms 6-9. Seeds mature mid-late summer. Cut flowers, dried seed heads, landscaping. 256,000 to 314,840 seeds per pound.

In a moist fall, this species will have a somewhat remontant bloom, late August through September.

"Uncommon in thickets and the edge of woods. Spring Creek woods northeast of Rockford, thickets east of Durand and the edge of woods on Meridian road near Cunningham road. Recently used as an erosion control plant in cuts and fills in road building as on Harrison road west of Cherry Valley." (Fell 1955)
Associates: Attracts hummingbirds.

BAPTISIA Ventenant 1808 **Baptisia, Wild Indigo, Redneck Lupine** *Fabaceae* From Greek *baptizein*, to dye, some species used as a poor grade indigo dye, as a substitute for *Indigofera tinctoria.* A genus of about 15 species of perennial herbs from central and eastern North America. Inoculate when transplanting. Useful for fresh cut flowers and dried arrangements. Good bumble bee forage. Fruit is inflated legume with hard seeds, often parasitized by Bruchid beetles. Soil forming and nitrogen-fixing. Attractive flowers, deep taproot. *Baptisia* need both rhizobia and mycorrhiza to thrive. The eagerness to change the traditional scientific names of common Illinois *Baptisia* species may be premature.

Baptisia leucantha / Baptisia leucophaea firmly scarify seed then inoculate with *Baptisia* spec. 1, or fall sow. It is sometimes suggested to cold moist treat seeds for 10 days after scarification, but in my experience this has not been necessary. Light to medium cover. Watch damping off. Uneven germination. (mfd 1993)

Fall planted seed may germinate in 3 to 4 waves over the summer.

Genus propagation is float seed, scarify, cold moist stratify (10 days) or fall plant; germination may occur for an extended period of time. Burying seeds deeply may slow germination. Easy from scarified, inoculated and moist stratified seed. "90 days moist stratification required for good green house crop. Scarification necessary." (pn nd) Cullina (2000) recommends scarification or outdoor treatment. Seedlings grow slowly and resent being over-potted. Code A or B, I. Rooted cuttings fail to produce over-wintering crowns.

Baptisia alba (L.) Vent. var. **macrophylla** (Larisey) Isely *MI WHITE WILD INDIGO, aka Indian Bean, Large-Leaved Wild Indigo, Milky White Indigo, White Redneck Lupine, White Wild Indigo (*albus -a -um* from Latin *albus*, white, particularly a dull rather than a glossy white, or, dead white; pale; bright; *macrophyllus -a -um* large-leaved, from Greek μακρος, *macros*, long; tall, high, deep, *-o-*, and φυλλον, *phyllon*, leaf, foliage.) *B. leucantha* Torrey & A. Gray is probably the correct name.
Habitat: Wet, mesic, and dry prairies, mesic savanna. Full to partial sun, dry to mesic prairie and woods. In sandy and loamy soils.
Culture:. Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (Heon et al. 1999) Easy from scarified seed. Inoculation is important, but mycorrhiza are also necessary in rebuilt urbane soils.
Description: general form Erect, perennial, 3'-6' tall, mostly smooth forb culms stems with many branches toward the top but below the inflorescence leaves palmately-divided into 3 leaflets, drying to a gray-black color flowers white, 5-merous, 1/2"-3/4" long, stalks less than 1/4" long; inflorescence a 8"-20" long, erect, spike-like raceme with the small, deciduous leaves (bracts) below the inflorescence less than 1/2" long; fruit blackish-brown, inflated, cylindrical, erect pod key features Plant mostly smooth; long, erect raceme; deciduous leaves or bracts below the inflorescence less than ½" long.

Comments: Blooms 6-8. Seeds mature early fall. Landscaping. 25,536 to 47,544 seeds per pound. "A sturdy plant", some liken its structure to a peony bush. "A common and showy prairie plant." (Fell 1955) Forever known as *B. leucantha*. It may be more appropriate to refer to *Baptisia alba* as eastern and *Baptisia leucantha* as midwestern and western.
Associates: Pollinated by bumblebee workers.

Baptisia australis (Linnaeus) R. Brown Ex Ait.f. *IN, MA, NC, OH BLUE FALSE INDIGO, aka Blue Wild Indigo, Plains Baptisia, Plains Wild Indigo, Prairie Blue Indigo, Rattlebush, Rattlebush Wild Indigo, Rattlepod, Wild False Indigo (*australis* southern, of the southern hemisphere, from the Latin *australis* southern)
Habitat: Full sun to light shade, but not shade tolerant. Moderate moisture, prairies and woods, in sandy, loamy soils.
distribution Considered introduced in Wisconsin (2 counties)
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: Erect perennial, 2'-3' tall forb. Spikes of light blue to deep purple, 5-merous, 1". 2.0-4.0' Trifoliate leaves.
Comments: Blooms 5,6. Seeds mature late summer. Landscaping. A rare plant in some of the Midwest, and considered non-native our area, but striking plant in the landscape. Reported to be aggressive in one suburban Chicago remnant. 23,744 to 28,117 seeds per pound. Does well on exposed loamy sands. Provides food and cover for wildlife. Flowers are subject to nectar thieves, chewing holes in the lower side of the flowers, with no subsequent seed set.

Baptisia bracteata Muhl. ex Elliott var. **glabrescens** (Larisey) Isely *MI CREAM WILD INDIGO, aka Creamy Wild Indigo, Long-bracted Wild Indigo, Plains Wild Indigo (grayish-white, from *leucos,* bright, brilliant, clear, white, pale, -*o*-, and *phaeos*, from *phaios*, dusky, gray, and –*us*, a Latinizing suffix.) This may more appropriately called *Baptisia leucophaea* Nuttall.
Habitat: Mesic, dry, and sand prairies. Prairies and woodlands, full sun to partial shade, dry to mesic.
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: general form Native erect, perennial, 10"-32" tall, fuzzy forb culms plant breaks easily when dry and is tumbled by the wind leaves palmately-divided into 3 leaflets with the stipules at the base appearing as 2 additional leaflets, dries to a gray-black color flowers cream to yellow, 5-merous, 3/4"-1" long, stalks 1/2"-1 1/2" long; inflorescence a 4"-8" long, drooping cluster (raceme) with the small, permanent leaves (bracts) below the inflorescence greater than 1/2" long; fruits are elliptical, fuzzy pods with a pointed beak key features Plant fuzzy; drooping racemes, permanent leaves or bracts below the inflorescence greater than 1/2" long; stipules appearing as 2 additional leaflets.
Comments: Blooms 4-6. Landscaping. 22,400 to 30,766 seeds per pound. Often becomes a tumbleweed in winter. Some say it does poorly on exposed soils, but ours in such a location were the first of the planting to bloom on our farm. "This is also common on prairies but is a lower and more spreading plant than the preceding (*B. leucantha*) and the flowers are more yellow. It resists grazing for many years. The pods of the and *Baptisia leucantha* are infested with a long-nosed black bettle (sic), probably a *Mylarbia*." (Fell 1955)
Associates: Pollinated by bumblebee queens.

Baptisia minor
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)

Baptisia sphaerocarpa
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)

Baptisia tinctoria (L.) R.Br. ex W.T. Aiton *IA, WI YELLOW WILD INDIGO, aka Honesty-weed, Horsefly-weed, Rattleweed (*tinctorius -a -um* belonging to dyers, of dyes, New Latin, used in dyeing, from *tinctus, tingo*, to wet; to dye, and -*orius,* capability, functionality, resulting action)
Habitat: Open, acid sandy woods, moist sandy woods.
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: Erect perennial, 3.0-4.0', bushy forb, flowers yellow, 5-merous, ½" long; inflorescence numerous short terminal clusters; fruits are roundish, single-seeded small pods.
Comments: Blooms 6-8, at the same time as *B. leucantha.* Seeds mature fall. 72,727 (gni) seeds per pound.

CLADRASTIS Rafinesque **Yellowwood** *Fabaceae* From the Greek *klados,* a branch, and *thraustos*, fragile for the brittle shoots. A genus of 5-6 species of deciduous trees of the southeast United States with 4 species in the mountains

of Japan and China.

Cladrastis lutea (Michaux f.) K. Koch *IL, IN YELLOW WOOD (*luteus -a -um* yellow, a distinct yellow, a full yellow; pale yellow, for the yellow wood.)
Native to the southern Appalachians, Ozarks and limestone regions in between.
Fine textured, medium tree, ash-like leaves with alternate leaflets, and pendant panicles of creamy white flower clusters in early summer. Smooth, silvery-gray bark and panicles of pods through winter. Zone 4.

CORONILLA Linnaeus **Crown-vetch** *Fabaceae* New Latin, irregular from Latin diminutive of *corona* crown, garland, wreath, from Greek *korone* anything curved, tip of a bow, stem of a ship, kind of crown, from *koronos* curved; akin to Latin *curvus* curved, Greek *skairein* to dance; from the flower clusters. Old World often-woody herbs, hardy and semi-hardy shrubs having purple, pink, or yellow flowers in long-stalked axillary heads or umbels.

C. varia is the larval host of *Coleophora colutella* (*Lepidoptera: Coleophoridae*), which has recently been reported as immigrating into the U.S. (Hoebeke et al. 1993)

Coronilla varia Linnaeus CROWNVETCH, aka Purple Crownvetch (New Latin variegated, varying, from Latin *varius*, having variegated, mottled, various color.)
Habitat: Road cuts, often escaping into adjacent lands. Disturbed sites and roadsides. Naturalized on well-drained, infertile soils. Slightly acidic to neutral, well drained soils. Adapted to many soil types. Best in medium coarse to medium fine soils. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance high. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 5.0-7.0, 5.5 and higher best. Neutral to acidic soils, some base tolerance. distribution This plant occurs everywhere but Alaska, North Dakota, Puerto Rico, and the Virgin Islands. Native to the Mediterranean.
Culture: To eradicate burn in late spring, pull, mow for several years, spray legume or broadleaf herbicide.

Slow to establish, sow with a cover crop such as annual rye grass at 20 -30 lb per acre, but aggressive and stable (?) after one or two seasons. Can also use 30 lb per acre Tall Fescue (but why plant either species?). Seeding with *Panicum virgatum* said to give quick erosion control and works well. Two years to establish completely. Seed in spring (Stocks). Drill 15-20 lbs per acre (Stocks). Pure stand plant 15-20 lb pls per acre in spring or fall (Granite), or frost seed (usda). Plant 1 lb per 1000 or 25 per acre (Ernst) ???. 20 lb/acre alone (Ernst 2002). Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.
Description: general form Introduced medium tall, loosely-erect, long-lived perennial, 1-2(3)', forming dense colonies roots 1" minimum root depth. How's that for erosion control potential? Multi-branched root system, with spreading fleshy rhizomes culms with creeping stems, 2-6' leaves stalkless, pinnately-divided into an odd number (11-25) of leaflets flowers white, pink to purple, 5-merous, 1/3"-1/2" long; inflorescence a 1/2" round, dense umbel; fruits are long, narrow, 4-angled pods with 3-7 segments surrounding the seeds key features Oddly pinnate leaves (11-25 leaflets). Not a true vetch, it lacks tendrils for climbing.
Comments: Ecologically Invasive. This plant is considered invasive in much of the United States. Blooms 5-9. This species is said to be good for erosion control on steep banks, but will choke out grasses. Plantings with grass will tend to become monocultures of crown vetch. Rill and gully erosion occurs under the canopy, as under Sugar Maples in Illinois. Fall plantings may winterkill. Drought tolerant, cold hardy. May cause bloating in livestock. 98,000 to 110,000 seeds per pound. Seed counts vary significantly with the variety, so up to 140,000 seeds per pound (usda). Most people reading this are more interested in killing this plant, and rightly so, but it is important to know a little about your enemy. Doesn't grow worth a damn where you need erosion control, but vigorous as hell where you don't want it.

CROTOLARIA Linnaeus 1753 **Rattlebox** *Fabaceae* New Latin, from Latin *crotalum,* from Greek *krotalon*, a rattle, a bell, castanet, used to accompany wanton dances, and New Latin *-aria*; from the rattling of the ripe seeds in the pod when shaken. A very large genus, about 600 species, of mainly tropical annual and perennial herbs with chiefly simple leaves and showy yellow flowers in racemes. Nearly cosmopolitan in tropical and temperate regions, most diversity in Africa.

Crotalaria sagittalis Linnaeus *WI RATTLE BOX, aka Arrowhead Rattle-box, Common Rattlebox, Weedy Rattle-box (*sagittalis -is -e* sagittate, arrow-like, from Latin for like an arrowhead)
Habitat: Dry, disturbed, sandy soil. Acid sands.
Culture: No pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09
Description: general form Erect annual 0.5'-1.5' tall hairy forb leaves hairy, almost stalkless, undivided, linear to lance-shaped flowers yellow, 5-merous, 1/8"-1/2" long; inflorescence with 2-4 short-stalked flowers per raceme; fruit an oblong, inflated, and mostly stalkless pod key features Plant hairy; leaves undivided.
Comments: Blooms 6-9. This genus has been shown to reduce populations of parasitic soil nematode populations.

65,783 to 72,000 seeds per pound.

DALEA Linnaeus 1758 **Prairie Clover, Tassels, Dalea** *Fabaceae Dalea* Named after Samuel *Dale* (1659-1739), an English physician, botanist and botanical collector, and gardener who was the author of several botanical works and a treatise on medicinal plants. He was an associate of several major botanical figures in England. In the broad sense a genus of about 160 species primarily of the dry areas of temperate and tropical America. Weakley (2007) notes that the inclusion of *Petalostemon* in *Dalea* is controversial and the recognition of *Petalostemon* may be warranted.

DESMODIUM Desvaux 1813 **,Tick Clover, Tick Trefoil, Beggars Lice, Stick Tights** *Fabaceae* Desmodium a long branch or chain, from New Latin, probably irregular from Greek *desmos* band, bond, from *dein* to bind and New Latin –*ium*. Alternately from Greek *desmos*, a chain, for the jointed stamen (by some authors), but probably for the resemblance of segmented fruit to a chain. Large genus (76+ species in USA) of coarse perennial (some annuals), chiefly tropical herbs having stipulate pinnate leaves, racemose flowers, and indehiscent fruits (loments) that separate into one-seeded segments with small hooked hairs that stick to clothing or animals. Nearly cosmopolitan but lacking in Europe. A walk through a ripe *Desmodium* patch may just ruin that new flannel shirt.

Desmodium and *Desmanthus* propagation "Scarify then inoculate, or fall sow. Light cover. Good germination." (mfd 1993) easy by scarified, inoculated and stratified seed

Hull, scarify, and inoculate. No cold treatment necessary unless indicated, but bottom heat helps. "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Attracts butterflies, small mammals, and quail.

Desmodium canadense (Linnaeus) Augustin de Candolle SHOWY TICK TREFOIL, aka Canadian Tick-trefoil, Showy Trefoil, Hoary Tick Trefoil (of Canada or ne USA)
Habitat: Mesic prairie. Moist to wet soils, thickets and streambanks. In moist years, this species does well on excessively drained sands. "Common, mostly in prairie situations, along railroads and in the Sugar River sand area." (Fell 1955)
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) 3-4 pls lbs per acre for a wildlife planting (USDA).
Description: general form Erect, perennial, 3'-6' tall forb culms branching toward the top leaves 3-parted, on stalks up to 3/4" long and up to half as long as the end leaflet flowers rose-purple to pink, 5-merous, flowers aging to blue, 1/3"-1/2" long, stalked; inflorescence a branched, dense cluster (panicle) of several, spike-like clusters (racemes) with obvious small, leaf-like bracts beneath, fruit is flat pod, slightly curving, divided into triangular segments that are covered with clinging, hooked hairs key features Inflorescence is a branched, dense panicle of several spike-like clusters; flat pod, slightly curving, of triangular segments; leave stalks up to half as long as the end leaflet.
Comments: Blooms 7-9. C3. Cut flowers, landscaping. Open-pollinated. Surprisingly drought tolerant. aggressive, stick tights 72,000 to 142,297 seeds per pound.
Associates: Provides food and cover for quail, pheasant, turkey, ground birds, songbirds, and deer. Adversely impacted by *Popillia japonica*.

Desmodium canescens (Linnaeus) Augustin de Candolle *WI HOARY TICK TREFOIL (*canescens* gray (or white) and somewhat hairy, gray-pubescent, generally hoary or whitish, from New Latin *canescens* gray, grayed, or hoary, from, *canescens, canescent*, from *canesco*, to become white or gray. Generally for the tiny whitish hairs.)
Habitat: Fields and woods.
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: general form Erect, perennial, 3'-6' tall, very hairy forb often with many branches roots long taproot leaves 3-parted, leaf stalk much longer than the end leaflet flowers pink to greenish, 5-merous, 1/3" long, stalked; inflorescence a 3"-6" long, branched cluster (panicle) of several spike-like clusters (raceme); fruit flat, mostly straight pod divided into segments and covered with hooked hairs key features very hairy plant; mostly straight pod; leaf stalk much longer than the end leaflet. "Species has a much branched stem." (ilpin)
Comments Blooms 7-9. C3. 44,800 seeds per pound. "Less common than the preceding (*D. canadense*), in the same locations. The flowers are pale, the plant is pale, the leaves are petioled, the stipules conspicuous, and the loment stipitate." (Fell 1955)
Adversely impacted by *Popillia japonica*.

Desmodium glutinosum (Muhl. ex Willd.) A.W. Wood POINTED TICK TREFOIL, aka Beggar's-Lice, Cluster-leaf Tick-trefoil (*glutinosus -a -um* glutinous, sticky, very sticky)
Habitat: Oak savannas. Dry woods, in rich soil.
Culture: Cold moist stratify (10) 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: general form Erect, perennial, 2'-5' tall forb culms stems unbranched leaves usually several 3-parted,

long-stalked leaves bunched just below the inflorescence; leaflets broadly oval flowers pink, 5-merous, 1/4"-1/3" long, stalked; inflorescence a 4"-32" branched cluster (panicle) on a leafy stalk; fruit flat pod covered with clinging, hooked hairs and divided into 2 or 3 rounded triangular segments key features stems unbranched; leafy stalk; leaflets broadly oval; pod divided into divided into 2 or 3 rounded triangular segments. "Leaves are clustered at the base of the peduncle." (ilpin)
Comments: Blooms 6-8. C3. 13,400 seeds per pound. "A graceful plant that is common in woods. The leaves are whorled at the base of the terminal inflorescence, the flowers being purple." (Fell 1955)
Associates: The large seeds are scavanged by small mammals, especially in the greenhouse.

Desmodium illinoense A. Gray *OH ILLINOIS TICK TREFOIL, aka Prairie Ticktrefoil (*illinoensis -is -e* of or from Illinois)
Habitat: Sand prairie and dry roadsides. Dry to moderate moisture.
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: general form Erect, perennial, up to 3' or 4' tall forb leaves 3-parted, lance-like, both sides rough with hooked hairs; leaf stalk much longer than the stalk of the end leaflet flowers single terminal inflorescence of white to blue or pink, 5-merous, 1/3" long, stalks about 1/2" long; inflorescence a sparsely-flowered, long cluster (raceme) either with none or only a few branches; fruit flat, mostly straight pod covered with clinging, hooked hairs and divided into 2-5 rounded segments key features sparsely flowered long raceme; pod divided into rounded segments; leaflets rough hairy top and bottom; leaf stalk much longer than the stalk of the end leaflet. "Species has slender stem with few branches; lower leaf surface is prominently reticulate." (ilpin)
Comments: Blooms 7-8. C3. Landscaping aggressive, Seeds are stick tights. Leaves have small hooked hairs and will stick to clothing like natural Velcro. 67,696 to 70,689 seeds per pound. "Common along roads and railroads, a slender plant with unbranched inflorescence. Leaves petioled, stem pubescent, pods stipitate, the joints oval or orbicular." (Fell 1955)
Associates: Attracts upland game birds and songbirds.

Desmodium paniculatum (Linnaeus) Augustin de Candolle var. **dillenii** (Darl.) Isely PANICLED TICK TREFOIL, aka Dillenius' Tick-Trefoil, Perplexed Tick-Trefoil (*paniculatus -a -um* with flowers in panicles)
Habitat: Moist to dry savannas, mesic woods.
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: 5-merous flower, flat pod, divided into triangular segments, covered with hooked hairs.
Comments: Blooms 7-9. C3.

Desmodium sessilifolium (Torrey) Torrey & A. Gray *OH SESSILE-LEAF TICK TREFOIL
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description/comments: "Leaves are sessile or nearly so." (ilpin) Blooms 7-9. C3. 80,000 to 82,000 seeds per pound.

GLYCYRRHIZA Linnaeus **Licorice** *Fabaceae* New Latin, from Latin, licorice root, from Greek *glykyrrhiza*, from *glykys* sweet, and *rhiza* root. Widely distributed perennial herbs or subshrubs with odd-pinnate leaves, racemose or spicate flowers, and leathery often-prickly pods. Common name from Late Latin *liquiritia*, alteration of Latin *glycyrrhiza*.

Glycyrrhiza lepidota Pursh WILD LICORICE, aka American Licorice (*lepidotus* with small scurfy scales)
Habitat: Dry prairies, typically railroad prairies. In Wisconsin moist prairies and along railroads. distribution In Illinois considered adventive from the west, but a rare native in Wisconsin?
Culture: No pre-treatment necessary other than cold, dry stratification. Seeds need scarification. Legume, requires appropriate rhizobial inoculum. (pm 09) Scarify, inoculate.
Description: general form perennial forb, up to 40" tall, younger parts and bottom of leaflets covered with dot-like glands roots clone-forming, creeping roots culms 1.5-3.0' leaves pinnately-divided into an odd number of leaflets (11-19) flowers pale yellow to bluish, 5-merous, 1/2" long; inflorescence a dense, conical-shaped cluster (raceme) of stalked flowers, clusters near or below the upper leaves fruit brown, 1/2" pod with hooked prickles key features Younger parts and bottom of leaflets covered with dot-like glands; flower clusters near of below the upper leaves, fruit pod with hooked prickles; oddly pinnate.
Comments: Blooms 5-7. C3. Aggressive, rhizomatous adventive from west. 57,344 to 62,400 seeds per pound.

LATHYRUS Linnaeus 1753 **Vetchling, Wild Pea, Everlasting Pea** *Fabaceae* New Latin, from Greek *lathyros,* the name for the pea or chickling, or *lathyros, lathuros*, a name for leontopodion, Eidelweiss, or *lathyris, lathuris*, Wolf's

milk. A genus of about 150 species, annual and perennial herbs, nearly cosmopolitan, including many peas and vetchlings, differing from members of the genus *Pisum* in having the style not sulcate.

Lathyrus palustris Linnaeus MARSH VETCHLING, aka Marsh Pea, Marsh Peavine, Marsh Vetchling, Slender-stem Pea-vine (*palustris* marsh-living, of swamps, marshes, or growing in bogs, marsh loving, from Latin *paluster -tris -tre* marshy, boggy)
Habitat: Wet to moist meadows, shores, and marshes.
Culture: Further germination pretreatments not sure? (Prairie Moon)
Description: general form Native climbing, perennial, 1'-4' long forb culms stems often winged leaves pinnately-divided into 2-4 pairs of leaflets with a tendril at the end; asymmetrical, sharp-pointed, leaf-like appendages at the bas flowers purple and white, 5-merous, 3/4" long; inflorescence a long-stalked cluster (raceme) of 2-6 stalked flowers; fruit is a long pod key features Climbing, stems often winged, 2-4 pairs of leaflets, asymmetrical sharp-pointed appendages. "Stems are winged; plant is glabrous." (ilpin)
Comments: Blooms June - July. C3.
"*L. myrtifolius* Muhl. Marsh pea. More common than *L. palustris* and in the same wet places. The slough west of Shirland (*L. palustris* L. var. *myrtifolius* (Muhl.) Gray)." (Fell 1955)
"The stems are winged but it is otherwise very similar to *L. myrtifolius*. The boggy places in Coon Creek bottom." (Fell 1955)

Lathyrus venosus Muhlenberg ex Willdenow *IN, KY, NJ, NY, OH VEINY PEA, aka Forest Pea, Pea-vine, Rough Veiny Vetchling, Smooth Veiny Pea or Peavine, Veiny Vetchling, Vetchling, Wild Pea
Habitat: Dry prairies and savannas, rich woods, thickets, stream banks, and dry or sandy soils.
"Our most common wild pea. It grows in woods, in brushy and in open places. Rock Cut Forest Preserve, C. & N.W. r.o.w. near Cherry Valley, and in the dunes north of Shirland where it at times forms large dense patches in dry sand in the open." (Fell 1955)
Culture: Legume, requires appropriate rhizobial inoculum. Further germination pretreatments not sure? (pm 09) Scarify, inoculate, cold moist stratify (10) fall plant.
Description: general form Native climbing, perennial, 2'-3' long, stout forb with a wingless stem leaves ovate, pinnately-divided into 8-12 elliptical leaflets with a tendril at the end; asymmetrical, narrowly arrow-shaped, leaf-like appendages at the base flowers purple to red, 5-merous, 3/4" long; inflorescence a dense, stalked cluster (raceme) of stalked flowers; fruit a flat long pod key features Climbing wingless stem; 8-12 elliptical leaflets; asymmetrical, narrowly arrow-shaped. leaf-like appendages. "Leaves veiny beneath; hairy plants." (ilpin)
Comments: Blooms 5,6. C3. Ethnobotanical uses, landscaping. Rhizomatous, herbaceous vine. 29,072 seeds per pound.

LESPEDEZA Michaux 1803 **Bushclover, Lespedeza** *Fabaceae* New Latin, irregular caused by misreading of the surname from V. M. de *Zespedes* or de Céspedes *fl*1785 (or 1790) Spanish governor of East Florida. Herbaceous or deciduous shrubby plants having exstipulate leaves, often both apetalous fertile and papilionaceous sterile flowers, and one-jointed one-seeded pods covered by the calyx. Hull, scarify, cold moist stratify (10) or fall plant, inoculate while replanting, easy from scarified, inoculated, moist stratified seed. The hulling process usually scarifies the seed. Successional restoration. Attracts upland game birds, songbirds, and small mammals, herbivores. Fruit is a one seeded legume or loment. Nitrogen fixing. Some species are widely used for forage, soil improvement, and especially hay in the southern U.S.

From the International Code of Botanical Nomenclature (Saint Louis Code), Electronic version CHAPTER VII. ORTHOGRAPHY AND GENDER OF NAMES SECTION 1. ORTHOGRAPHY Article 60. "The spelling of the generic name *Lespedeza* Michx. (1803) is not to be altered, although it commemorates Vicente Manuel de Céspedes (see Rhodora 36: 130-132, 390-392. 1934)."

Lespedeza capitata Michaux *KY ROUND-HEADED BUSH CLOVER, Bush Clover, Roundhead Lespedeza (*capitatus -a -um* with a head, from Latin *caput*, a head, and *–atus*, possessive of or likeness of something.)
Habitat: Mesic, dry, hill, and sand prairies, sand savannas, dry, open woodlands. Dry to moderate moisture, prairies and open woods, often in sandy, loamy, or gravelly soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement low. Salinity tolerance none. Shade intolerant, full to partial sun. pH 5.7-8.2. distribution "Common on high prairies and in sand areas." (Fell 1955)
Culture: "Very gently scarify seed then inoculate with EL inoculum or fall sow or spring direct sow" (mfd 1993). Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Anon 1981 recommends 1-2 lbs/acre. Works well by successional restoration method. Growth rate slow. Seedling vigor low. Vegetative spread rate none.
Description: general form Slender, erect perennial, 2'-4' tall forb with dense, fine hairs roots 18" minimum root depth culms stems usually unbranched or with a few branches toward the top leaves trifoliolate, variably pubescent, mostly oval, pointing upward flowers white to ochroleucous, or cream with a pinkish throat, 5-merous, 3/8" long;

inflorescence a rounded, dense cluster (head) of crowded, stalkless flowers turning dark brown when mature key features Inflorescence a rounded dense cluster.
Comments: Blooms 7-9. Attractive dried seed heads, landscaping. Deep tap rooted, drought-resistant species. 128,000 to 275,000 seeds per pound. 60 lbs/bushel. "*Lespedeza longifolia* DC. Uncommon on dry prairies. Rockton 5 miles north of Rockford, east of Ill. Rt. No. 173 north of Harlem, the C. & N.W. Ry. east of Winnebago, and in the sand in the north part of Shirland Township. (*L. capitata* var. *longifolia* (DC.) T.&G)" (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, and Lepidoptera. Good nesting cover for upland game birds and songbirds. Deer eat the plants.

Lespedeza virginica (Linnaeus) Britton VIRGINIA LESPEDEZA, aka Slender Bush-clover (*virginicus -a -um* of Virginia)
Habitat: Dry woods; in sandy, rocky soil.
Culture: Cold moist stratify for 10 days (Wade). Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: general form Erect, perennial, 1'-4' tall forb culms 1 to a few stems leaves 3-parted, the leaflets narrow; pointing upward on long-stalks flowers pink to purple, 5-merous, 3/8" long, irregular shape; inflorescence a small, leafy, crowded cluster (raceme) of stalked flowers, leaves below the cluster longer than its stalk.
Comments: Blooms 7-9. 160,000 to 253,417 seeds per pound.

LUPINUS Linnaeus **Lupine, Lupin** *Fabaceae* New Latin, from Latin, *lupinus*, of or like a wolf, wolfish, from *lupus*, wolf, from the belief that lupines robbed the soil of nutrients, and the name of the lupin. About 150-200 species of annual and perennial herbs and shrubs of temperate and tropical regions of North America, the Mediterranean, Europe, South America, and Africa, with digitate or unifoliolate leaves, and white, yellow, blue, or purple flowers in long racemes. The genus is very diverse in western North America and South America. Fruit is a few-seeded legume. The common name is spelled with or without the final -e.

Seeds mature in summer and are expelled as the ripe pods shatter. They must be harvested slightly green. Lupine seed has hard seed coats that must be nicked with a file or rubbed between two sheets of sandpaper for other than fall planting. Inoculate with rhizobium. Best planted in the spring in the garden (it kind of resents life in a pot). Code A, I. (Cullina 2000)

Lupinus perennis Linnaeus *IA, ME, MD, NH, PA, RI, VT WILD LUPINE, aka Lupin, Sundial Lupine, Wild Blue Lupine (perennial, from Latin *perennis*, remaining or lasting throughout the year.)
Habitat: Sand prairies, sand savannas, dunes. Sands and loose well drained soil distribution North central and northeast Illinois. Near Amboy, lee County. "Frequent on the dunes north of Shirland but not found elsewhere in the county." (Fell 1955)
Culture: Fresh seed is reported to give some results. Scarify, cold moist stratify (10), inoculate or fall plant. Easy from scarified, inoculated and moist stratified seed.

Seeds need scarification. 30 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) "10 days moist stratification required for germination. Field sow fall." (pn nd) Potted plants are subject to root rot. Best from seed sown in its permanent location.
Description: general form Erect, perennial, 12"-24" tall forb leaves palmately compound leaves, 7-11 leaflets flowers blue, less commonly pink or white, 5-merous, 1" long; inflorescence a 4"-8" tall, dense, terminal raceme of stalked flowers sometimes almost verticillate; fruit pubescent, oblong, flattened pod coiling when open; 2 to several seeds N key features Palmately compound leaves, 7-11 leaflets.
Comments: Blooms 4-7. C3. Requires fire, can be aggressive, soil builder. 16,000 to 21,300 seeds per pound.
Associates: The tiny hairs from stems and pods are irritating to some people when cleaning seed. Pollinated by honeybees, bumble bees, eastern carpenter bees, and butterflies including black swallowtails, clouded sulphurs, and Karner Blues. Attracts bees, butterflies, moths. *L. perennis* is the only(?) larval host of the Karner Blue butterfly *(Lycaeides melissa samuelis*). Larval host of Frosted Elfin (*Callophrys irus*).

PEDIOMELUM Rydberg **Buckroot, Prairie-turnip** See **Psoralea** *Pediomelum* from Greek for apple of the plains, from *pedio*, plains, and *melon*, an apple.

PETALOSTEMUM (*Dalea* in part) Also correctly spelled *Petalostemon.* **Prairie Clover** *Fabaceae* New Latin, from *petalo-*, from Greek *petalon* leaf, and Greek *stemon* warp, thread, similar to Old Irish *sessam* act of standing, Sanskrit *sthaman* station, and deriving from Greek *histanai* to cause to stand, set, place meaning standing upright. Perennial glandular herbs of the central and western United States and Mexico having pinnately compound leaves and pink, purple, or white pea-like flowers in close heads or spikes and exhibiting a superficial resemblance to clovers. Attracts small mammals, butterfly larvae, butterflies, upland game birds and songbirds. Sought out by herbivores. Nitrogen fixing, tap-rooted legumes. Fruits are one-seeded legumes.

Hull, scarify, inoculate, cold moist stratify 10 days or fall plant. Bottom heat may help in greenhouse. Successional restoration and direct sowing are also successful. Mature plants second year. Inoculation of fall planted legumes is, at least, controversial. Code A, I. (Cullina 2000)

"Gently scarify seed then inoculate with F inoculant, or fall sow. It is sometimes suggested to cold moist treat seeds for 10 or 30 days after scarification, but in my experience this has not been necessary." (mfd 1993). Drill or broadcast seed 1/4 to 1/2" deep in fall or pretreated seed in the spring. Seed should be inoculated on sites where prairie clover has not grown in the very recent past. Plant 1 to 3 pls lbs / acre. Easily established from transplants or scarified, inoculated and moist stratified seed. Like all herbaceous legumes, prairie clovers require endomycorrhizae as well as rhizobia.

Petalostemum candidum (Michaux ex. Willdenow) Michaux *TN WHITE PRAIRIE CLOVER (New Latin *candidus*, very white, from *candidus*, glistening, dazzling white, white, clear, bright, from *candere* to shine, be white. Similar to *candidatus* clothed in white, referring to the white toga worn by candidates for office in ancient Rome, as a symbol of purity. Is this why McCain and Palin wear dark suits?)
Habitat: Mesic, dry, hill, and sand prairies, savannas, dry upland woods, Mesic or dry gravelly soils. Low to moderate water requirements. Full sun. Coarse to moderately fine soils. Neutral to basic soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade tolerant intermediate. pH 6.0-8.0. distribution Adventive in Wisconsin. "Less common than the following (*P. purpureum)* but found in the same places." (Fell 1955)
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Damping off problems with seedlings. In single species plots plant 2.6 oz. per 1,000 sq. ft. (Stock). Pure stand plant 8 lb per acre (Granite). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. In open ground with fire, white prairie clover will slowly self-sow.
Description: general form Native erect perennial, 1'-3' tall smooth forb roots 14" minimum root depth leaves small, pinnately-divided into an odd number of leaflets (5-9) slightly wider than *D. purpurea* flowers white, 5-merous, 1/4" long; inflorescence up to 2" long, dense; fruits are tiny brown pods that don't split open when mature key features White flowers; oddly pinnate leaflets.
Comments: Blooms 6-8. Cut flowers, landscaping, cylindrical spikes of white flowers, blooming from the base up. Attractive in mass when combined with short grasses. 240,000 to 451,292 seeds per pound.
Associates: Pollinated by long-tongued bees, short -tongued bees, other Hymenoptera, Diptera, Lepidoptera. Highly palatable to livestock and wildlife, but USDA says this is slightly toxic.

Petalostemum purpureum (Vent.) Rydb. *KY, MI, OH, TN PURPLE PRAIRIE CLOVER, aka Violet Prairie Clover (*purpureus* purple, from Latin *purpureus*, adjective, purple colored, dark red, dark brown, clad in purple, gleaming, bright, beautiful, for the purple flowers.)
Habitat: Mesic, dry, hill, gravel, and sand prairies, clay soils to sands, native to tall grass prairie, mid grass prairie and Great Plains. Sandy or gravelly soils. Low to moderate moisture requirements. Full sun to partial shade. Well-drained sunny areas. Coarse to fine soils. Neutral soils.
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) For single species plot, plant 3.2 oz. per 1,000 sq. ft. (Stock). Pure stand plant 8 lb per acre (Granite). Soak seeds 6-8 hours in hot water and sow in spring (pots 2000). Drill 2 pls pounds per acre for production in 36" rows, or drill 6 pls lb per acre for a solid stand. Use inoculated stratified seed in the spring and inoculated unstratified seed in the fall. (USDA) The success of fall inoculation in the upper Midwest is questionable. In native mixes, use up to 0.5 pounds per acre.
Description: general form Native erect perennial nitrogen fixing legume, 12-24", slender, airy, mostly hairless roots deep rooted, very drought tolerant culms usually several branched stems leaves medium, green finely compound leaves, with many, very narrow leaflets (5), that roll backward when dry flowers cylindrical spike of rose-purple, or red-purple, 5-merous, 1/4" long; inflorescence up to 2" long elongated cones, blooming from the base up: fruit is a tiny, one-seeded, indehiscent, pinkish-brown pod key features Mostly hairless; inflorescence up to 2" long; very narrow oddly pinnate leaflets.
Comments: Blooms 6-8. Good cut flowers and attractive dried seed heads. Ethnobotanical uses. Landscaping, useful in roadside plantings, wildlife habitat, and prairie restoration moderately drought tolerant. The unhulled seed has a definite pinkish-gray color. The other species' hulls are darker. Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, Hemiptera. Plants are largely cross-pollinated. Good wildlife plant, provides food and cover attracts butterflies and other beneficial insects. Highly palatable and nutritious to livestock. 283,307 to 395,126 seeds per pound.

PSORALEA *Fabaceae* New Latin, from Greek *psoraleos* scabby, itchy, from *psora* itch. Widely distributed herbs and shrubs with glandular compound leaves and spicate or racemose purple or white flowers hull-scarify-cold moist stratify (10 days) inoculate. This genus has been split into *Orbexilum, Pediomelum*, and *Psoralidium.*

Psoralea esculenta Pursh *WI PRAIRIE-TURNIP, aka Breadroot Scurf-Pea, Pomme-De-Prairie, Shaggy Prairie-Turnip (*esculentus* Latin edible**,** esculent**)**
Habitat: Dry prairies and plains, in sand soils. Native north and west of Illinois.
Culture: Cold moist stratify 10 days. Seeds need scarification. (Wade nd)
Description: general form Erect, perennial, 4"-16" tall forb with many branches and spreading hairs roots roots thickened into an edible tuber leaves palmately 5-parted on stalks 1/2"-4" long flowers blue, 5-merous, 3/4" long; inflorescence a 1"-3" tall, dense, conical spike of stalkless flowers; fruit is a hairy pod key features Many branches and spreading hairs; leaves palmately 5-parted.
Comments: Blooms 5-7. 16,000 seeds per pound.

Psoralea onobrychis *IA [*Orbexilium onobrychis*] FRENCH GRASS
Habitat: Dry prairies, dry savannas.
Culture: Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09)
Description: Blue flowers. 2.0-3.0' Blooms 6,7,8. Landscaping. Can be aggressive in a planting, but it may not persist. 12,432 seeds per pound

Psoralea tenuiflora Pursh *In [*Psoralidium tenuiflorum*] SCURFY PEA, aka Gray Scurf Pea, Scurf-Pea.
Dry prairies, hill prairies, and oak openings. Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) Blue flowers. 1.5-3.0' Blooms 6-9 . 22,016 seeds per pound.

STROPHOSTYLES Elliot **Woolly Bean, Fuzzy Bean, Sand Bean, Wild Bean** *Fabaceae* From Greek *strophe*, turning, and *stulos*, style, for the curved style. A genus of 3 species of annual and perennial herbs of North America.

Strophostyles helvula (Linnaeus) Elliot ANNUAL WOOLLY BEAN, aka Annual Sand Bean, Trailing Wild Bean, Wild Bean
Habitat: Sandy soil, wet ditches, dry savannas, and wet mesic prairies, dry woods, sand bars, roadsides, fields. Dry areas, in sandy soil and in cinders.
Culture: Scarify, cold moist stratify, inoculate. 30 days cold moist stratification. (pm 09)
Description: general form Native twining, sprawling, annual herbaceous vine, to 40" long leaves mostly smooth, stalked, oval, 1/2"-3" long, 3-parted, some with side lobes flowers pink or purple, 5-merous, 1/2" long; inflorescence a loose, long-stalked head of stalkless flowers, fruit 1 1/2"-3 1/2" long, rounded pod coiling when open; several woolly seeds key features Flowers ½" long, stalkless; leaves mostly smooth, oval, some with side lobes.
Comments: Blooms 7-10. 6,400 seeds per pound. The species has at least some leaflets lobed. The var. *missouriensis* (S. Wats.) Britt., with unlobed leaflets grows along the Mississippi in dry woods. The two varieties grow together at the John Deere facility, Dubuque, Iowa.

Strophostyles leiosperma (Torr. & A. Gray) Piper *WI SLICK-SEED FUZZY BEAN, aka Small-Flowered Wild Bean, Wild Bean (*leiosperma* smooth-seeded from Greek *leios,* smooth, and *sperma*, seed.)
Habitat: Moist to dry areas, shores, dunes, woods, in sandy soils.
Culture: Code H, scarification, Ken Schaal.
Description: general form Twining, annual, herbaceous vine leaves densely hairy, stalked, oblong to lance-shaped, 1/2"-3" long, 3-parted flowers 5-merous, 1/4" long; inflorescence a loose, long-stalked head of stalkless flowers; fruit 1/2"-1" long pod coiling when open; several woolly seeds key features Flowers ¼" long, stalkless; pod 1/w" to 1" long; leaf densely hairy, oblong to lance-shaped.
Comments: 80,000 seeds per pound.

TEPHROSIA Persoon **Hoary pea, Goat's-rue** *Fabaceae* New Latin, Ash-gray or hoary, from Greek *tephros* ash grey, from *tephra* ashes, from the ashen grey appearance of its foliage. A genus of 400 species of herbs or undershrubs of tropical and warm temperate regions the Old and New Worlds, having odd-pinnate leaves, white or purplish flowers, and flat legumes.

Tephrosia virginiana (Linnaeus) Persoon GOAT'S RUE, aka Hoary Pea, Rabbit-pea, Virginia Goat's-rue (*virginiana* of Virginia)
Habitat: Hill, sand, and dry prairies, sand savannas, dry woods. Inland sands, prairies; in sandy soils. Thrives on dry soil. distribution Occasional throughout Illinois. "Common in Sugar River sand area but not seen elsewhere." (Fell 1955)

Culture: Seeds ripen in early summer with most explosively discharged as the pods split. Scarify and cold moist stratify (10 days) inoculate. "Scarify then inoculate, or fall sow. Light cover, good germination." (mfd 1993) Seeds need scarification. 10 days cold moist stratification. (pm 09) Germination said to be difficult by some, Cullina (20000 recommends thorough scarification followed by outdoor stratification. Handle seedlings while young, avoiding damage to the taproot, or sow in its permanent location. Code B, I. (Cullina 2000). Best from scarified, inoculated, moist stratified seed. Spreading freshly ripened seeds into open, sandy restorations works well. Self sows on sands.
Description: general form Native erect to drooping, perennial, 8"-28" tall forb; 1 to several, usually unbranched stems with dense, fine hairs leaves pinnately-divided into an odd number (15-25) of leaflets flowers attractive yellow and pink, 5-merous, ½"-3/4" long; inflorescence a 1"-2" tall, stalked raceme of stalked flowers; fruits are long, narrow, hairy pods coiling when open key features Flowers pink and yellow; leaves oddly pinnate.
Comments: Status phenology Blooms 6-7. Landscaping, nitrogen-fixing. 32,000 to 40,000 seeds per pound. Fruit is a several-seeded legume that explosively releases the seed when ripe.
Associates: Flowers pollinated by long-tongued bees. Attracts upland game birds and songbirds.

VICIA Linnaeus 1753 **Vetch, Tare** *Fabaceae* From Latin *vicia, viciae*, vetch. Widely distributed genus about 150 species of often climbing annual, biennial, or perennial herbs of temperate Eurasia and North America, having pinnate leaves terminating in a tendril and blue, purple, or yellow flowers either solitary or in axillary racemes, the style usually beaked or tufted, and the ovary containing numerous ovules, including valuable fodder and soil-building plants as well as a few that are toxic.

Vicia americana Muhl. ex Willd. *MD AMERICAN VETCH, aka Purple Vetch (*americanus -a -um* of the New World, American)
Habitat: Mesic prairies, woodland borders, disturbed woods and disturbed prairies. Moist woods and meadows. "A native plant found not uncommonly in brushy places along railroads and in fence rows." (Fell 1955) Tolerant of coarse and medium soils textured soils. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance high. Fertility requirement high. Salinity tolerance none. Shade intolerant. pH 5.9-7.2. distribution occasional in n. 1/3 of Illinois, absent elsewhere.
Culture: Scarify, cold moist stratify (10) inoculate. Growth rate moderate. Seedling vigor low. Vegetative spread rate slow. Spreads slowly from seed. *As of 2009, no longer in the seed trade*.
Description: general form Herbaceous perennial climbing or trailing perennial vine, up to 3' long roots minimum root depth leaves pinnately-divided into 4-8 pairs of elliptical leaflets, leaf tips with tendrils flowers bluish purple, 5-merous, 1/2"-1" long, style tip hairy all around, calyx base mostly not swollen; inflorescence a loose, stalked raceme with 2-9, stalked flowers key features "Species has sparsely flowered raceme, shorter than the subtending leaves." (ilpin). Plant climbing or trailing; style tip hairy all around, 2-9 stalked flowers; 4-8 pairs of elliptical leaves.
Comments: phenology Blooms 5,6. C3. Slow to spread from seed. Climbing or trailing by tendrils at end of pinnate leaves. 32,833 to 80,000 seeds per pound.
Associates: Nitrogen fixing, nodules reported. Provides food and cover for wildlife.

WISTERIA Nuttall **Wisteria, La Glycine** *Fabaceae* Named in 1818 by Thomas Nuttall in honor of Dr. Casper Wistar (1761-1818) a University of Pennsylvania professor of anatomy, distinguished botanist, and president of the American Philosophical Society. Wistar tutored Meriwether Lewis in medicine and paleontology in preparation for his expedition. Unfortunately, Nuttall misspelled Wistar's name as Wister, hence there are two spellings of the genus name, with the spelling error conserved. About 6 species of woody vines, shrubs, and small trees, of temperate east Asia and eastern North America.

The twining direction is determined by looking at the vine from the base, circling clockwise is dextrorse, circling counter clockwise is sinistrorse. Some Asian species are separated based on the direction they the vines twine, left to right or right to left. Most Wisterias sold are Chinese, Japanese, Formosan, or hybrid in origin. Some Asian species bloom before the leaves emerge, with all blooms simultaneous, but these plants in the Midwest are subject to frost damage, and may not bloom every year. American species bloom (with jingoistic pride!) annually, after the leaves emerge, and sequentially within the cluster. They are much hardier, if a bit less showy. The genus was originally called *Glycinia*, from a Greek word for sweet in reference to the sweet scent of some species. Glycine or glicine is still used as a common name. Deciduous climbers. Chinese and Japanese Wisterias are considered invasive.

☠ The flowers, seeds, and leaves contain the poison wistarine, which causes nausea, repeated vomiting, stomach pains, severe diarrhoea, dehydration and collapse. 1-2 seeds may cause serious poisoning in a child.

Wisteria macrostachya (Torrey & A. Gray) Nuttall ex B. L. Robinson & Fernald [alternately *Wistaria*,] *IN, MI KENTUCKY WISTERIA, aka American Wisteria
Habitat: A very rare adventive in the wild in northern Illinois, becoming more available as landscape material. Native species of swamps, bottomland forests, and wet thickets. Tolerant of coarse, medium and fine textured soils.

Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 4.0-7.0.
Culture: Plant in greenhouse late winter, steeping seed helps, somewhat extended germination. Growth rate rapid. Seedling vigor high. Vegetative spread rate moderate. Seed spread rate slow.
Description: Blooms 5,6 tall growing woody vine, with compound leaves, purple blue flowers at the cane terminals. 6-10" long tan, hairless bean pods persist through the winter, dehiscing in the spring, or occasionally in very dry falls following maturation. Seeds are reniform.
Comments: Our material comes from a landscape planting which has persisted in Manlius, Bureau County since around the turn of the last century, and has bloomed consistently for the last 49 years (2009). Native to swampy woods, generally confined to the s 1/5 of Illinois. Native north to Clark and Richland cos, adventive northward. Kentucky Wisteria is the hardiest taxon. Easy to grow and drought tolerant. Zone 4. Blooms 3-5 years after planting one-gallon plants. Clusters of spotted tan brown pods persist until the following spring, providing winter interest, but some may shatter in very dry falls.

"Melita, domi adsum."

MIMOSACEAE **Mimosa** New Latin, from Latin *mimus* mime, from Greek *mimos*; and *-osa*, feminine of *-osus -ose*; akin to Greek *mimeisthai* to imitate, represent,from its apparent imitation of the sensitivity of animal life in drooping and closing its leaves when touched. A genus of trees, shrubs, and herbs that are native to tropical and warm regions and have usually bipinnate often prickly leaves sometimes reduced to phyllodes and globular heads of small white or pink flowers.

DESMANTHUS Willdenow **Bundleflower** *Mimosaceae* New Latin, from Greek *desme* bundle, from *dein* to bind akin to Albanian *dua* sheaf, Sanskrit *daman* rope, and New Latin *–anthus*, flower. 25 species of mostly tropical American herbs or shrubs with sensitive bipinnate leaves and small whitish acacia-like flowers, approximately 14 species in USA.

Desmanthus propagation "Scarify then inoculate, or fall sow. Light cover. Good germination." (mfd 1993) Easy by scarified, inoculated and stratified seed.

Desmanthus illinoensis (Michaux) MacM. ex B.L. Robins. & Fernald ILLINOIS BUNDLE FLOWER, aka Illinois Mimosa, Illinois Sensitive Plant, Prairie Bundleflower, Prairie Mimosa (*illinoensis* of or from Illinois)
Habitat: Gravelly riverbanks, railroad embankments, and levees, dry and sand prairies, mesic and wet prairies, sandy wet savannas. Throughout the plains and southeast, requires minimum 16-20" precipitation. Medium to high moisture requirements. Best in moderately coarse to moderately fine soils. Best neutral soils, acid and base tolerant. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 5.0-8.0. distribution This species may be adventive in northern Illinois, as it is typically found along railroads. It is considered adventive in Wisconsin. It is native to the middle Illinois River Valley, growing in moist gravelly shores and riparian prairies, where in spite of the USDA's no anaerobic tolerance, it survives annual flooding. Weakley states it is native mostly west of the Mississippi River and to the limestone ares of Tennessee.
Culture: Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm 09) Hull, scarify, cold moist stratify or fall plant and inoculate. Soak seed in water 6-8 hours prior to sowing in spring (pots 2000). When planted alone, 8 oz per 1,000 ft. sq. (Stocks). Pure stand plant 10 lb per acre. (Granite). Growth rate moderate. Seedling vigor high. Vegetative spread rate none. Seed spread rate slow.
Description: general form Native perennial, warm-season, herbaceous, deep tap rooted, drought tolerant, legume with white to pinkish, globose, acacia-like flowers roots 12" minimum root depth culms 24-48", with semi-woody stem bases, 3.0-4.0'.
Comments: This plant is considered invasive in some parts of its range. Blooms 7-8, followed by bundles of red brown pods. Good fresh cut or attractive dried seed heads. Used for erosion control, works well in IDOT roadside plantings. May be aggressive. Fruit is a cluster of curved legumes, nitrogen fixing. 67,000 to 81,362 seeds per pound.
Associates: Used for high protein wildlife food. Good palatability to big game, seeds desirable for wild birds, including upland game birds (quail), small mammals, and songbirds. Flowers pollinated by long-tongued bees. Nectar source for butterflies.

Ἥν οἰδα ὅτι οὐδὲν οἰδα (*Hen oida hoti ouden oida*.) I know one thing, that I know nothing." (Socrates, paraphrased from Plato's Apology)

LEMNACEAE Some authors place the *Lemnaceae* in the *Araceae*. Go figure.

LEMNA *Lemnaceae* New Latin, from Greek for star grass, *Callitriche verna*, a water plant. Very small aquatic herbs having simple fronds with a single root

Lemna spp DUCKWEED, WATERFLAXSEED, DUCK'S MEAT
Habitat: Fresh slightly acidic or hard water. Ponds, potholes, sloughs, bays, or sloughs.
Culture: Scatter live, freshly harvested plants among rushes, brush, flooded downed trees, sheltered bays, land-locked ponds, or sloughs.
Description: Perennial. Waterfowl, marsh birds, and shorebirds eat plants.

LILIACEAE A.L. de Jussieu 1789 Lily Family New Latin, from the classical Latin name, lily, from OE. *lilie* wk. fem., from Latin *līlium*, from Greek λείρον, *leiron, lirion*. In recent years the old Lily family as known from eastern North America, has been split into about 20 families. The former broad-based *Liliaceae* is considered artificial and polyphyletic; molecular research reinforces the reorganization. It is considered to consist of about 11 genera and 550 species of the Northern Hemisphere. In the broad sense, the family contains 280 genera and about 4200 species. x = 3-27+.

ALLIUM *Liliaceae* A.L. de Jussieu 1789 or *Amaryllidaceae*. This may also be placed in *Alliaciaceae* J. Agard 1858 (Onion Family). New Latin, from *allium, alium*, the classical Latin name for garlic, from Greek name ἄγλις, *aglis*, for *A. sativum,* garlic; perhaps akin to Sanskrit *āluka*. Perennial bulbous herbs distinguished by the characteristic odor, sheathing, mostly basal leaves, and umbellate white, pink, yellow, or red flower, sometimes with aerial bulbils. Pollinated by Diptera, attracts small mammals; some species repel vampires. x = 7,8,9.

Some variety of germination patterns in species, with western species code D and eastern species code A (Cullina 2000). Many species can be divided in spring. Seeds and or topset bulbils mature from summer to fall, depending on the species, approximately 3-6 weeks after blooming. Bulbs should be planted 3-4" deep. *Alliums* are well adapted to sites that are moist in winter and spring, but dry out in summer. Most species are well suited for rock gardens. Division works well while plants are dormant.

Allium canadense Linnaeus WILD GARLIC, aka Wild Onion (of Canada or northeast USA)
Habitat: Wet meadows, mesic prairies, mesic and dry savannas and woods, disturbed areas low woods, thickets, and meadows, flood plains (Yarnell) distribution: "Our common early wild onion." (Fell 1955)
Culture: No treatment, the topset bulbils produce leaves while still on the mother plant.
Description: White or pink flowers, topset bulbs, 0.5-2.0'. 2n = 14, 21, 28
Comments: Blooms 4-7. Landscaping, can be aggressive and spread, but not competitive with grasses, edible. Do not confuse with the somewhat similar field garlic, *Allium vineale*, the agricultural and tree nursery weed. 8,960 to 15,655 topset bulbils per pound. *A. canadense* is a restricted (secondary) noxious weed in Illinois.

Bulblets can be short-lived and will dry out in woven poly bags in the seed room. Store in ziplock bags under refrigeration.
Associates: Attracts bees and butterflies. The strong flavored leaves can be used like chives in cooking.

Allium cernuum Roth *IA NODDING ONION, aka Nodding Wild Onion (from Latin, *cernuum*, nodding, from *cernuus, cernu-*, inclining the head, stooping.)
Habitat: Wet meadows, mesic and dry prairies. Ledges, gravels, and rocky or wooded slopes and crests. Dry stony slopes, often limestone outcrops. distribution: "Found on a roadside northeast of Roscoe but unknown elsewhere in this and in contiguous counties." (Fell 1955)
Culture: "Cold moist treatment or fall sow. Light cover. Good germination. May self sow." (Dunham 1993) 60 days cold moist stratification (pm 09). Stratify 1-2 months and spring plant (pots 2000). "30 days moist stratification required. Field sow fall." (pn nd) Fall plant or cold moist stratify. Several sources state sowing dry stored seed without cold moist stratification works well, but this is probably a case of a widespread species having various dormancy mechanisms in different parts of its range.

Division in early spring or fall, or any time with a little care.
Description: Perennial herb, 0.7-2.0', with a stem that bends just below the delicate pink flowers above flat, persistent leaves. 2n = 14.
Comments: Blooms 6-8. Cut flowers, attractive dried seed heads. May be aggressive where competition is light, but is out-competed by Eurasian grasses. Edible, it is a strong flavored onion, becoming more pungent as the seeds set. Try the flowers in a salad. Nodding Onion is said to inhibit the growth of alfalfa and other legumes. 108,366 to 152,272 seeds per pound, fruits are capsules with small black seeds.
Associates: Attracts bees and butterflies. Pollinated by bees. Seldom browsed by deer.

Allium stellatum Ker Gawl PRAIRIE or CLIFF ONION, aka Autumn Onion, Pink Flowered Onion, Wild Onion, in Ojibwa *Mukode'cigagawunj,* prairie skunk plant, the root word *cigaga,* to wit Chicago. *Mukode* is an Algonquin word

meaning prairie, related to Muscatine. (From Latin *stellatum,* with stars, starry)
Habitat: Dry prairies.
Culture: 60 days cold moist stratification (pm 09). Fall plant or cold moist stratify, division.
Description: Pink flowers on stems that do not bend below the inflorescence. 0.7-1.5'. Blooms 7-8. Ethnobotanical uses, attracts butterflies, edible. 145,454 to 176,000 seeds per pound. Fruits are capsules with small black seeds. 2n = 14.

Allium textile
60 days cold moist stratification (pm 09). 2n = 14, 28.

Allium tricoccum Aiton WILD LEEK, aka Ramp, in Ojibwa *Sigagawunj* onion, the rootword *cigaga,* to wit Chicago.
Habitat: Rich woods and bottom lands, rich deciduous woods, moist in spring.
Culture: Cullina 2000 code C. In order to germinate, seeds need a warm, moist period followed by a cold, moist period. Plus not sure? (Prairie Moon)?
Description: Species has red stems and leaf sheaths, shallow bulbs, The broad leaf blades (over 2.5 mm) emerge in spring then die back, with flower stalks appearing in July. Var. *burbuckii* has species has pale or green stems and leaf sheaths, deep bulbs, leaf blades less then 2.5 cm wide, and blooms in June with fruits maturing in July. 2n = 16. 22,400 to 26,469 seeds per pound. "A common woodland plant that is best known by its two leaves which appear early and are gone by flowering time. We have not seen the red sheathed form mentioned by Hanes in his Kalamazoo County, Michigan, Flora." (Fell 1955)

CAMASSIA Lindley 1832 **Wild Hyacinth, Quamash Lily, Camas Lily** *Liliaceae* From Native American name *quamash* or *camass*. Bulbous herbs.

Seeds require cold moist stratification. Plants are best produced in a seed bed. Only one leaf is produced the first year, with 4-5 years to flower from seed. Code B. Some species produce offsets. (Cullina 2000)

Camassia angusta and **Camassia quamash** 60 days cold moist stratification (pm 09).

Camassia scilloides (Rafinesque) Cory *MI-WI WILD HYACINTH (also spelled *scillioides*) (like *Scilla,* the Old World squills, the sea squill *Urginea maritima*)
Habitat: Mesic prairies, mesic savanna, woodland borders.
Culture: "Cold moist treatment, or fall plant. My experience suggests that it may be beneficial to cold store seed soon after collecting until ready to treat seed. Light to medium cover. Germination not reliable. Plants dormant by mid-summer." (Dunham 1993) 60 days cold moist stratification (Prairie Moon 2009). Fresh seed or cold moist stratify immediately, cool soils. Division in fall, fall transplant, temperature sensitive.
Description: Blue flowers, 1.0-2.0'.
Comments: Blooms 5,6. Seeds mature summer. Cut flowers, landscaping, slow grower, 67,200 to 129,600 seeds per pound. "Known on low prairies in Boone but unknown to us in this county." (Fell 1955)

LILIUM Linnaeus 1753 **Lily** *Liliaceae* New Latin, from the classical Latin name, lily. Herbaceous plants having scaly bulbs, whorled or scattered leaves, showy flowers with a perianth of six segments, versatile anthers, a 3-lobed stigma, and a capsular fruit.

Seeds mature in early fall. Seeds require a warm moist period followed by a cold moist period. Germination is hypogeal. Lilies are slow growers from seed. Code D. Separation of bulb scales will produce plants twice as fast as seed. (Cullina 2000)

Lilium canadense Linnaeus YELLOW WOOD LILY (of Canada or northeast USA)
Culture: "First warm moist treatment for 60 to 90 days them cold moist treatment, or direct fall sow. light cover. Seedlings go dormant mid-summer. Seedlings may need to overwinter in seed flats before ready to transplant. Fair germination. Tedious growing." (Dunham 1993)

Lilium michiganense Farwell MICHIGAN LILY, aka Turk's Cap Lily
Habitat: Fens, moist savannas, swales, mesic to wet prairies.
Culture: In order to germinate, seeds need a warm, moist period followed by a cold, moist period (pm 09). Division (clone).
Description/comments: Orange flowers pollinated by Lepidoptera. Blooms 6-8. Attracts hummingbirds 72,000 to 160,000 seeds per pound. "Rather common, usually found on wet prairies but also to some extent in low woods. (*L. superbum* L.)" (Fell 1955)

Lilium philadelphicum Linnaeus var. **andinum** PRAIRIE LILY, aka *lis de Philadelphie,* Wood Lily
Habitat: Dry woods, meadows, prairies, and forests, in sandy soils. Tallgrass prairies, open woods, thickets, roadsides, powerline rows,
Culture: 60 days cold moist stratification (pm 09). Division
Description: Orange flowers, 2n = 24. Blooms 6-7. 72,000 to 240,000 seeds per pound. Pollinated by *Papilio glaucus*, the Eastern Tiger Swallowtail, hummingbirds are occasional vivitors. Grazed by deer.

Lilium superbum Turk's Cap Lily
In order to germinate, seeds need a warm, moist period followed by a cold, moist period (pm 09).

MELANTHIUM *Liliaceae* New Latin, from Greek *mela,* black, dark, and Greek *anth*-, from *anthos*, blossom, flower and *-ium*, from Greek ιο, of, like, from the dark color of the fading perianth. A small North American genus (4 species) of perennial herbs with heavy rootstocks and erect leafy stems bearing a terminal panicle of yellowish flowers having clawed perianth segments. x = 8.

☠ *Melanthium* species should be considered poisonous, containing steroidal precursors similar to *Veratrum*.

Melanthium virginicum Linnaeus *IN BUNCH FLOWER, aka Virginia Bunchflower
Habitat: Wet meadows, wet savannas.
Culture: Fall plant or cold moist stratify. 60 days cold moist stratification . (pm 09)
Description: culms 3.0-4.0' flowers white, seeds pale yellow to tan, broadly winged N 2n = 16 key features "clawed tepals of *Melanthium virginicum* distinguish it from *M. parviflorum* and *M. woodii*, which have tepals with gradually attenuate bases." (fna)
Comments: Blooms 6,7,8. 144,000 seeds per pound.

NOTHOSCORDUM Kunth 1843 **Grace Garlic, False Garlic** *Liliaceae* sometimes placed in *Alliaceae*

Nothoscordum bivalve (Linnaeus) Britton FALSE GARLIC, aka Grace Garlic (Code C Ken Schaal). An onion-like plant mostly lacking the onion odor. 368,000 seeds per pound.

POLYGONATUM P. Miller 1754 **Solomon's Seal** *Liliacaea* From the Greek *Polygonaton* from Greek *polys* many and *gony* a knee, in reference to the jointed rhizome.

Seeds are hydrophilic and ripen in early fall when the berries are blue-black. Remove seeds from pulp and plant immediately outdoors. The pulp may contain germination inhibitors. Roots emerge the first year, cotyledons the second year. Pot and grow an additional two years. Code C*, G. (Cullina 2000) Dig rhizomes in fall, removing the end 2-4" as a division. Replant the ends and back sections. Plants may be stunted as they first emerge. Such production beds can be divided on a three-year rotation.

Polygonatum canaliculatum (Muhl.) Pursh. SMOOTH SOLOMON'S SEAL, aka Solomon's Seal.
Habitat: Mesic and dry savanna, mesic woodland, woods and thickets (often under good bird perches)
Culture: Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm 09). "Double dormant. Field sow fall". (pn nd) Macerate, fall plant. Double dormant.
Description: Green flowers. Blooms 5-7 Dried berries, landscaping 12,419 22,146 seeds per pound.

SMILACINA Desf. *Liliaceae* Diminutive of *Smilax.* Seeds are hydrophilic. Difficult from seed. Remove seeds from pulp and plant immediately outdoors in permanant location or in galvanized flat in shade house. The pulp may contain germination inhibitors. Germination is hypogeal. Roots emerge the first year, cotyledons the second year. Pot and grow an additional two years. Code C*, G. (Cullina 2000) Dig rhizomes in fall, removing the end 2-4" as a division. Replant the ends and back sections. Plants may be stunted as they first emerge. Such production beds can be divided on a three-year rotation.

Smilacina racemosa (Linnaeus) Desfontaines FEATHERY FALSE SOLOMON'S SEAL, aka Feathery Solomon's Plume, False Solomon's Seal, Solomon-Plume, False Spikenard (with flowers in racemes)
Habitat: Mesic and dry savanna, rich moist woods, woods, clearings, and bluffs.
Culture: Propagate from seeds separated from pulp and sown immediately, division in spring. (wfp). Cold moist stratify (wade). Clone. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09) "Double dormant. Field sow fall." (pn nd) Cold

moist stratify or fall plant, double dormant.
Description: White flowers, 1.5-3.0'.
Comments: Blooms 4-6. Dried seed heads. Aggressive rhizomes. 10,810 to14,400 seeds per pound**.** "Common in woods particularly in the black oak woods in Sugar River sand area." (Fell 1955)

Smilacina stellata (Linnaeus) Desfontaines STARRY FALSE SOLOMON'S SEAL, aka Small False Solomon's Seal
Habitat: Sand savannas, mesic to dry or sand prairies and woodlands, and moist woodlands.
Culture: Clone. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)
Description: White flowers. Blooms 4-6. "Common on bluffs and in thickets and woods." (Fell 1955)

SMILAX Linnaeus 1753 **Greenbrier, Carrionflower, Smilax** *Liliaceae* From the classical Latin name. Evergreen and deciduous climbers. Macerate, scarify, fall plant, double dormant.

Smilax lasioneura Hook. CARRION FLOWER, aka Jacob's Ladder
Habitat: Mesic savanna, fence rows, moist woods, edge of fields .
Comments: Further germination pretreatments not sure? (Prairie Moon)?
Description/comments: Green flowers, blue fruits. Blooms 5-7 Herbaceous vine "Common in woods, thickets, and fencerows." (*S. herbacea* var. *lasioneuron* (Hook) A. DC.)" (Fell 1955)

UVULARIA Linnaeus 1753 **Bellwort, Merrybells** *Lilaceae* New Latin, from *uvula*, the hanging structure in the back of the throat, resembling the hanging flowers. Temperate eastern North American herbs, about 5 species, having erect stems, sessile or perfoliate leaves, and yellowish drooping bell-shaped flowers.

The hydrophilic seeds ripen in midsummer, as the capsules start to yellow. The maturing seeds turn from translucent white to tan. Dry capsules for 3-7 days and sow immediately or store moist. Seedlings are hypogeal, emerging above ground the second spring. Pot and grow on 2 more years. Code C*. Divide rhizomes in late summer as plants die down. (Cullina 2000)

Uvularia grandiflora J.E Smith LARGE-FLOWERED BELLWORT, aka Yellow Bells, Yellow Bellwort
Habitat: Rich woodlands, common through Illinois. Further east cove forests and other rich, forested sites (Weakley 2007). "Common in damp woods and ravines." (Fell 1955)
Culture: Said to like humusy acid soils, but Cullina (2000) calls it a lime-lover and dusts with dolomite powder yearly! Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)

ZIGADENUS Michaux 1803 occasionally spelled *Zygadenus. Liliaceae* New Latin, alteration of *Zygadenus*, from Greek *zygaden,* jointly, in pairs, from *zygon* yoke, pair, and *aden*, gland, similar to *zeugnynai* to yoke, join, Sanskrit *yuga* yoke, *yunakti* he yokes, joins. Once upon a time, a genus of 15+ species North American and Asian herbs having basal linear leaves and a terminal panicle of whitish or greenish flowers with a flat spreading perianth. According to Weakley (2007), *Zigadenus* is redefined as a monotypic genus of SE North America, consisting of *Z. glaberrimus* Michaux. 2n = 52.

Zigadenus glaucus Nuttall (or a double Nutt.?) * AZ, IL, IN, NY, PA, TN, WI WHITE CAMASS, aka Alkali Grass, Death Camass, Mountain Deathcamas. The common name may be seen as camass or camas.
Habitat: Calcareous springy places.
Culture: 60 days cold moist stratification, or best planted outdoors in the fall. (pm 09).
Comments: Blooms 7-8. 8,000,000 seeds per pound.

LINACEAE DC. ex Gray 1821 **Flax Family** About 14 genera and 250-350 species of trees, vines, shrubs, and herbs, cosmopolitan.

LINUM Linnaeus 1753 **Flax** *Linaceae* New Latin, from Latin name for flax, from Greek *linon*, flax, *Linum usitatissimum*. Herbaceous annual or perennial plants that have small sessile leaves, terminal or axillary racemes of flowers with fugacious petals, and capsular fruits. Annual and perennial herbs, subshrubs, and shrubs.

Seeds mature in summer. Seeds require cold moist stratification. Code B. (Cullina 2000)

Linum lewisii Pursh. LEWIS FLAX
Linum perenne Linnaeus BLUE FLAX introduced from Europe (perennial)

Habitat: *Linum lewisii* is a perennial from western prairies and plains, well drained acidic to alkaline soils, drought tolerant, full sunlight. Best in dry sunny sites in light, infertile soils. Low moisture requirements. Coarse to moderately fine soils. Best in neutral soils, some base tolerance and weakly acid and weakly saline tolerant. Plants will tolerate semi-shaded areas.
Culture: Broadcast seed 1/4 to 3/4", covering lightly 3 to 4 pls lbs / acre. Light aids germination sow in spring or fall. Seeded alone plant 3.2 oz. per 1,000 ft. sq. (Stocks). Pure stand plant 5 pls lbs per acre (USDA) or 8 lb per acre (Granite). Difficult to transplant, easy from seed, sow any time (pots 2000), but USDA says fall dormant seedings best.
Description: Western native perennial, 1-2', 24", vase shaped structure, with dazzling sky-blue 1/2-1" flowers, each flower only lasts a day, opening in the morning and fading by the heat of the day, but the plant blooms from May to September. Leaves and stems are semi-evergreen.
Comments: Blooms 5-7, flowering is indeterminate, with ripe seed and flowers on the same plant. May bloom 1st year from seed. Attracts butterflies. Birds eat the seed and capsules in fall and winter. Provides a place where the deer and the antelope play and feed. Subject to damage from grasshoppers, rodents, and fungus. 285,000 to 295,000 seeds per pound

"*Linum perenne* Linnaeus PERENNIAL FLAX A perennial flower garden plant that often escapes and establishes itself on roadsides." (Fell 1955)

Blue Flax taxonomy is messy, especially when horticulturally driven. According to the USDA NRCS the native North American wildflower is PRAIRIE or LEWIS FLAX, *Linum lewisii* Pursh var. *lewisii*. The widely planted, introduced taxon is BLUE FLAX, *Linum perenne* L. Plants.usda .gov Plant Guide and Plant facts can be confusing, the plant guide lumps the two species, as I just kind of did. According to Cronquist et al. (1997), "the only significant difference between *Linum lewisii* and the Eurasian *Linum perenne* appears to be that the former is homostylic, and the latter heterostylic."

'Appar' is an improved selection of *L. perenne* with little dormant seed. Native lots maintain a percent of dormant seed that does not germinate the first season, and forms soil seed bank.

Linum rubrum [*Linum grandiflorum rubrum*] SCARLET FLAX
Habitat: North Africa and southern Europe, light well-drained soil, full sun or part or half shade, low to moderate moisture requirements. Open rocky soils of western North America. Prefers full sun, tolerates hot dry conditions and light soils. Coarse to moderately fine soils. Best in neutral soils, some base tolerance.
Culture: Easily established, broadcast 1/8 to 1/2" deep in fall or early spring, 15 pls lbs / acre self sows. Spring plant 6 oz. per 1,000 sq. ft. (Stock). Pure stand plant 15 lb per acre (Granite).
Description: Introduced annual, 14", 1.0-2.0', with delicate large red-scarlet flowers, each individual flower lasting only a day, but blooming from April to August, with new blossoms each day. Very slender gray-green leaves. Used in mass plantings and roadside plantings. Low maintenance plant. 122,000 to 285,000 seeds per pound.

Linum sulcatum Riddell GROOVED YELLOW FLAX, aka Yellow Flax (*sulcatus -a -um* sulcate, furrowed, grooved, or fluted.)
Fall plant or cold moist stratify 60 days. Annual or biennial (Wade) 30 days cold moist stratification (pm 09).
1,504,000 seeds per pound. "Frequent on gravel hills and dry prairies; north of Forest Hills Country Club, west of Broadway near the I.C.R.R., and the bluff west of Rockton." (Fell 1955)

Linum usitatissimum Linnaeus COMMON FLAX, aka Annual Flax (most useful)
Native of Europe. 100,000 seeds per pound. "We do not know of this being cultivated in the county but it is found occasionally on railroad tracks." (Fell 1955)

LYTHRACEAE J. St.-Hilaire 1805 **Loosestrife Family** About 27 genera and 600 species, herbs, shrubs, and trees mainly tropical, a few warm temperate.

AMMANNIA Linnaeus **Redstem, Toothcup** *Lythraceae* (for Paul *Ammann*, 1634-1691, German botanist) A genus of about 25 species of cosmopolitan herbs.

This genus in northern Illinois is confusing as hell, even with only 2 species. According to Swink and Wilhelm, 1994, *A. coccinea* ranges close to the southern boundaries of the Chicago region. According to plants.usda.gov, it occurs in Cook, DuPage, and Will counties. Swink and Wilhelm note all Chicagoland specimens are sessile flowered and fruited *A. robusta*. According to plants.usda.gov, this latter species is uncommon and ranges about 150 miles southwest of Chicago.

But then of course, the USDA calls it an annual forb/herb, Subshrub, which clarifies everything.

Ammannia coccinea Rottböll * PA VALLEY REDSTEM, aka Purple Ammannia, Scarlet Ammannia
Habitat: Tolerant of medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance medium Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 4.0-5.9.
distribution: ?

Description: Annual, 12" minimum root depth, purple flowers.
Comments: This plant is considered weedy and invasive by some authors. Blooms 600,000 (bogus) seeds per pound.

Ammannia robusta Heer & Regel *WA GRAND REDSTEM, aka Scarlet Loosestrife, Sessile Tooth-cup (From Latin *robustus*, of oak, strong, robust.)
Habitat: Seasonally inundated, alluvial, mudflats, ditches, and agricultural wetlands. Early successional hydric soil seedbank species. distribution: Known from west-central and southern Illinois?
Culture: Cold moist stratify or fall plant, light.
Description: Annual, scarlet flowers, 0.5-1.0'.
Comments: Blooms 7-9 Wetland restoration 9,072,000 to 27,515,151 seeds per pound.

DECODON J. F. Gmelin **Water-oleander, Water-willow** *Lythraceae* Greek *deca*, ten and *odous,* tooth for the summit of the calyx. A monotypic genus, a weak shrub, endemic to eastern north America.

Decodon verticillatus (Linnaeus) Elliott *IA SWAMP LOOSESTRIFE, aka Peatweed, Water-oleander, Water-willow, Whorled loosestrife (whorled)
Habitat: Bogs, marshes, wet meadows. Floodplain swamps of the middle Illinois River valley. Tolerant of coarse, medium, and fine textured soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance none. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermedium. pH 5.2-7.2.
Culture: Cold moist stratify is suggested (results?), division, cuttings. Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid. Seed spread rate slow.
Description: general form shrub, arching perennial, semi-aquatic, often forms floating mats in muddy areas culms 1-9' stems woody at the base and angled, arching over and re-rooting in the water, lower stems are spongy leaves short-stalked, lance-shaped, in whorls of 3 or 4 or in opposite pairs flowers pink or lavender, 5-merous, 1/3"-1/2" long, petals obvious, narrowing towards the base, 8-10 protruding stamens of 2 alternating lengths; inflorescence a dense cluster (cyme) of stalked flowers from the upper leaf axils. Fruit rounded capsule with many seeds.
Comments: Blooms 7-9 Aggressive suckers. 640,000 to 907,200 seeds per pound. USDA says this is routinely available. Yeah, but where? There is one seed source and two plant sources.

LYTHRUM Linnaeus **Loosestrife** *Lythraceae* From Greek *lythron*, blood, for the color of some species flowers. According to Pliny, a garland of spiked loosestrife around the neck of oxen helps them pull together as a team. A genus of about 36 species of perennial herbs, cosmopolitan. Flowers are heterostylic, with styles of different length in flowers of the same species. Fruit is a capsule with very tiny seeds.

Lythrum alatum Pursh WINGED LOOSETRIFE, aka Northern Winged Loosestrife
Habitat: Wet meadows, fens, marshes, alkaline seeps, mesic to wet prairies
Culture: "Cold moist treatment, or fall sow. Very light to no cover. Tiny seeds. Excellent germination." (Dunham 1993) Clean seed should be stored in an airtight container in cold storage until planting or further treatments. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify (30) / fall plant-light. Broadcast on top of ground.
Description/comments: Purple flowers. 1.5-3.0' Blooms 7-9. Cut flowers, landscaping, aggressive, calcareous. 21,619,047 to 48,000,000 seeds per pound. "Common in wet places as marshes, low prairies, streamsides, etc. throughout. In drainage ditches west of Yale Bridge over Sugar River is a form that has small lavender flowers." (Fell 1955)

MALVACEAE A. L. Jussieu 1789 **Mallow family** Some members of the Mallow family have hard seeds that may benefit from scarification.

CALLIRHOË Nuttall *Malvaceae* Named for one of several characters and fountains, springs or wells in Greek mythology, including, respectively, the daughter of the river god Achelous and wife of Alcmaeon, the daughter of Hermocrates, the daughter of Lycus, and the daughter of Oceanus; also a woman from Calydonia. Josephus mentions Herod the Great seeking relief from his terminal illness at the hot springs of Callirhoe or Callirrhoe, said to be east of the Dead Sea. Callirrhoe is also the name of one of Jupiter's outer moons and a hotel in Athens. Annual and perennial herbs.

Callirhoë has hard seeds which must be thoroughly scarified then stratified. Code B, I. Three node stem cuttings taken before well flowering is initiated root well. (Cullina 2000).

Callirhoe bushii Hot water treatment. 30 days cold moist stratification. (pm 09)

Callirhoë involucrata (with an involucre around the flowers.) western perennial. This species is gyno-dioecious, so to generally takes two to tango. Plant several for sound seeds. Sow seeds in fall or soak 6-8 hrs in water and spring plant. Hot water treatment. 30 days cold moist stratification. (pm 09) 33,600 seeds per pound.

Callirhoë triangulata *In-Ia CLUSTERED POPPY MALLOW (for the triangular leaves)
Habitat: Sand prairies and sand savannas.
Culture: Hot water treatment. 60 days cold moist stratification, scarify. (pm 09) "30 days moist stratification required for good greenhouse crop. Scarification required. Field sow fall, early spring." (pn nd) Cold moist stratify or fall plant-cool soils.
Description/comments: Magenta flowers 0.5-1.0'. Blooms 7. Seeds mature late summer. Cut flowers, landscaping. 86,400 to 96,000 seeds per pound.

HIBISCUS *Malvaceae* New Latin, from Latin, *hibiscum, hibiscus,* marshmallow. Herbs, shrubs, or small trees with dentate or lobed leaves and large showy flowers.

Hibiscus species have hard seeds (by the AOSA definition). Scarification may help. Seed ripens in fall. Fresh seed germinates well with no treatment (Deno). Seed that has been in storage will benefit from scarification, cold moist stratification, or both. Code B, I. Summer softwood cuttings. (Cullina 2000)

Hibiscus laevis All. *MI HALBERD-LEAVED ROSE MALLOW aka *H. militaris* Cav.
Habitat: Seasonally inundated areas, muddy shores, shallow water. Adapted to accretionary mud bars. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.5-7.2.
Culture: Cold moist stratify or fall plant. 60 days cold moist stratification. (pm 09) Bottom heat gives modest results, steeping seeds has not helped, cuttings. Growth rate moderate. Seedling vigor low. Vegetative spread rate none.
Description/comments: Pink flowers. 5.0-8.0'. Blooms 7-9. Wetland restoration, aggressive. 35,008 to 44,800 seeds per pound.

Hibiscus lasiocarpus Cav. *IN HAIRY-FRUITED HIBISCUS, aka Hairy Rose Mallow
Culture: 60 days cold moist stratification (pm 09). (Code C Ken Schaal).
Description: 35,200 to 96,000 seeds per pound.

Hibiscus moscheutos Linnaeus CRIMSONEYED ROSEMALLOW
Habitat: Riparian prairies, edges of wet woodlands, brackish woodlands. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 4.0-7.0.
Culture: Growth rate rapid. Seedling vigor high. Vegetative spread rate none.
Description: 10" minimum root depth. 200,000 seeds per pound.

Hibiscus palustris Linnaeus SWAMP ROSE MALLOW
Habitat: Wet meadows, edge of streams, and nearby marshes
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify-fall plant.
Description/comments: Pink flowers, 4.0-6.0', blooms 7-9. Wetland restoration, aggressive. 51,874 to 54,232 seeds per pound. Swink and Wilhelm (1994), and Fernald (1942a) hold this separate from *Hibiscus moscheutos*. Some Chicago area specimens are f. *peckii,* with creamy corollas and red-tinged throats.

ILIAMNA Greene 1906 **Globe Mallow** *Malvaceae* A genus of 7± species, North American perennial herbs.

Iliamna remota Greene KANKAKEE MALLOW, aka Kankakee Globe Mallow
Cold moist stratify 60 days (Wade) 192,000 seeds per pound.

NAPAEA Linnaeus 1753 **Glade Mallow** *Malvaceae* A monotypic genus of temperate central North America. A Federal Species of Concern.

Napaea dioica Linnaeus *IN, IA, MN, VA GLADE MALLOW
Habitat: Wet savannas, mesic woodland. Riparian prairies of the Rock River near Lyndon, Erie, and Joslin, wet railroad prairies in the middle Illinois River floodplain, wet railroad prairie west of Mineral, (the last now destroyed by IDOT, a curse on thee, Rich Maggi and Casandra Rogers, apparently someone thought Osama Bin Laden would hide in the coneflowers, so, on your watch, we allowed 2 miles of quality prairie remnant to be destroyed for the sake of a corn ethanol plant that was obsolete before it was complete).
Culture: Cold moist stratify or fall plant. 60 days cold moist stratification (pm 09).

Description: White flowers, blooms 6,7.
Comments: Rare species in Indiana and Virginia. Landscaping, attracks upland game birds and songbirds. Aggressive, fragrant, dioecious, not for the meek and timid. 49,718 to 84,800 seeds per pound.

"Irregular in distribution but not uncommon. It is usually near streams, is abundant on Rock River at High bridge in Rockford, in Rock River bottom west of Rockton, in Pecatonica bottom at Harrison, and Killbuck Creek in the Forest Preserve. Occasionally seen in very unexpected places as on a dry roadside in the sand area. Also in Kishwaukee River Bottom in DeKalb County and in a prairie slough in Stephenson County." (Fell 1955)

NYMPHAEACEAE R. A. Salisbury 1805 **Water Lily family** A family of 6 genera and about 75 species of aquatic herbs, cosmopolitan

BRASENIA Schreber Water Shield *Nymphaeaceae* Sometimes placed in *Cabombaceae* A. Richard 1828

Brasenia schreberi J.F. Gmel WATER SHIELD
Habitat: Clear quiet lakes and ponds.
Description: Aquatic species with an extremely slippery stalk as compared to other local vascular plants. The plants are coated with a transparent, mucilaginous jelly. 1,250,000 seeds per pound.

CASTALIA *Nymphaeaceae* from *Castalia*, a spring on Parnassus sacred to the Muses, from Latin, from Greek *Kastalia*, meaning a source of poetic inspiration. The genus *Nymphaea* is sometimes placed here.

NELUMBO Lotus *Nymphaeaceae* From the Sinhalese name.

Nelumbo lutea (Willd.) Pers. *MI AMERICAN LOTUS, aka Wonkapin, Water Chinquapin, (*luteus* for the yellow flowers)
Habitat: Ponds, quiet streams, and estuaries. Fresh water with a soft mud bottom, 1-3' in depth. Bays, sloughs, and ponds. Perhaps introduced generally and locally by Indians.
Culture: Anon 1981 recommends 500 scarified seeds / acre. 512 seeds per pound.
Description: Waterfowl eat the seeds. Aquatic furbearers eat the tubers. Fish eat the plants and use the cover.

NUPHAR J.E. Smith 1809 **Spatterdock, Yellow Pond lily** *Nymphaeaceae* New Latin, from Arabic *nufar*, short for *naynufar*, water lily or Egyptian Lotus. water lilies having flowers with showy usually yellow sepals and minute petals that resemble stamens or scales, leaves with a deep sinus, and a cylindrical creeping rootstock.

Nuphar advena (Aiton) Aiton f. YELLOW POND LILLY, aka Broadleaf Pondlilly, Spatterdock (*advena* adventive.)
Habitat: Pond margins and swamps, soft bottom lakes, ponds, sloughs, hard or soft water. 1'-4' deep
Description: Waterfowl eat tubers and seeds, aquatic furbearers (esp. Beaver, muskrat) eat plants. Marsh birds and shorebirds eat stems, root, and seeds. Fish eat plants and use them for cover.

"We have only one species which is common in sloughs and slow streams. The name we give is that of Jones' Flora but our plant answers better the description given in Gray's Man., 8th Ed., of *N. variegatum* Engelm. The rhizome is oval or round in section and is not uncommonly 3 or more inches in diameter." (Fell 1955)

NYMPHAEA Linnaeus 1753 **Water-lily** *Nymphaeaceae* New Latin, from Latin for water lily, from Greek *nymphaia*, akin to Greek *Nymphe*, a water nymph, or *nymphe*, a bride. Aquatic perennials, water lilies with sometimes fragrant flowers that have four green sepals and numerous petals that are as large as the sepals in the outer whorls and diminish centrally to the size and appearance of stamens and occur in white, pink to red, blue, and yellow in various members of the genus.

Nymphaea tuberosa Paine WHITE WATER LILY (tuberous.)
Habitat: Soft bottom lakes, ponds and sloughs. Hard or soft water. 1'-4' deep.
Culture: Anon 1981 says root stock ends in spring or fall for quicker results. Or, tubers in spring or fall, 750 per acre.
Description: Waterfowl eat tubers and seeds. Aquatic furbearers (esp. beaver and muskrat) eat plants, marsh birds and shorebirds eat stems, roots, and seeds.

"Much less common than the preceding (*Nuphar advena*): grows in similar places but the two are not often found together. Sugar River slough west of Shirland and in another slough west of Yale bridge. In a Killbuck Creek slough at U.S. Rt. No. 51 it grows with the preceding." (Fell 1955)

ONAGRACEAE A.L. de Jussieu 1789 **Evening-primrose Family** From *onagr-, onagra* Greek ονάγρα, *onagra,* oleander *Nerium oleander*. A family of about 18 genera and 650 species of herbs, shrubs, and rarely trees, cosmopolitan, but especially in temperate and subtropical America.

EPILOBIUM Willow Herb *Onagraceae* Evening Primrose family From Greek *epi* on and *lobos* a pod, and New Latin *-ium*; the corolla is on the end of the ovary. A large genus of about 200 species, widely distributed but primarily of boreal latitudes and alpine elevations, perennial herbs with pink or rarely yellow flowers, slender lanceolate leaves, and seeds with a silky coma.

Seeds germinate easily. Code A or B. Softwood stem cuttings in late spring. (Cullina 2000)

Epilobium angustifolium Linnaeus FIRE WEED, aka Fire Flower, Great Willow Herb, Great Willow-Herb
Habitat: Recently burned areas, full sun. Moderate moisture requirements, rich moist soil in open woods, prairies, along streams and disturbed ground. Coarse to moderately fine soils. Neutral soils, some acid tolerance. Needs extra moisture in gardens. Marginal native in Illinois, at the southern edge of its range.
Culture: Cold moist stratify or fall plant may improve germination. Light, division. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). "30 days moist stratification necessary for germination. Field sow fall." (pn nd) Pure stand plant 0.25 lb per acre (Granite). Sow in fall or stratify 60 days and sow in spring.
Description: Native rhizomatous perennial, 14-84", with large, orchid-pink flowers blooming all summer. Blooms 6-8. Ethnobotanical uses. A rare native in Illinois. Can be aggressive, but can't cut the mustard in NW Illinois, and dies out in our nursery. Fire successional, persistent rhizomes allows this species to dominate an area especially after fires or other disturbances. 7,884,800 to 10,400,000 seeds per pound.

"The one station we know of in the county is in an I.C.R.R. cut through limestone west of Rockford near Levings' park. On the damp shaded stone and in the ditch at the base of the cliff it has persisted for several years." (Fell 1955)

Epilobium coloratum Biehler CINNAMON WILLOW HERB, aka Bronze Willow-herb, Eastern Willow-herb, Fireweed
Habitat: Alluvial, fens, wet meadows, agricultural drainage ditches
Culture: Cold moist stratify for 60 days/ fall plant-light, sow on top of soil-successional restoration. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09).
Description: Small pink flowers, 1.0-2.0', blooms 6-9, strongly self sows, wetland restoration. 880,000 to 8,000,000 seeds per pound. "Common in marshes and other wet places often forming dense weedy patches.' (Fell 1955 as *E. coloratum* Muhl.)

"There are some difficulties in distinguishing this species and *E. ciliatum* in our area." (Weakley 2007)

Epilobium glandulosum Lehm. NORTHERN WILLOW HERB
Culture: Cold moist stratify for 60 days/ fall plant, light, sow on top of soil. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). 960,000 seeds per pound.

GAURA Linnaeus **Gaura** *Onagraceae* New Latin, from Greek *gaurē*, feminine of *gauros* majestic, splendid; from the beautiful flowers of some of the species. American herbs having flowers in terminal spikes or racemes.

Seeds mature late summer to early fall. Seeds need no treatment. Code A. Three node stem cuttings taken in spring before flowering root well. (Cullina 2000)

Gaura biennis Linnaeus BIENNIAL GAURA, aka Butterfly Weed.
Habitat: Ubiquitous, in a wide variety of habitats, hill prairies, dry, mesic, and wet prairies, open woods, roadsides and railroad ballast.
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant, light. GA3. Easy from seed.
Description/comments: Pink flowers pollinated by long-tongued bees 3.0-5.0'. Blooms 6-10. Attracts butterflies. Biennial, nut-like seed. 43,200 to 51,247 seeds per pound. "A common and showy roadside weed; mostly in prairie situations." (Fell 1955)

Gaura coccinea SCARLET GAURA
60 days cold moist stratification (pm 09). 22,400 seeds per pound.

Gaura longiflora
Seeds germinate after a period of cold, moist stratification (pm 09).

LUDWIGIA Linnaeus **Primrose willow** *Onagraceae* Sometimes seen as *Ludvigia.* New Latin, from Christian Gottlieb *Ludwig* 1709-1773 German botanist and professor at Leipzig, and New Latin *–ia*. A genus of about 82 species of perennial herbs and shrubs cosmopolitan, mostly of tropical or warm regions, that have 4-parted flowers and a short capsular fruit.

Ludwigia alternifolia *MI? SEEDBOX, aka Rattle Box
Habitat: Wet sands, acidic soils.

Culture:. 60 days cold moist stratification (pm 09). (Code C, D Ken Schaal) Cold moist stratify or fall plant, light, cuttings.
Description/comments: Yellow flowers, with persistent pinkish sepals, 2.0-2.5', blooms 7-8. Attractive dried seed heads, numerous small, square seed heads with attractive red fall color. Wetland restoration. 11,350,139 to 16,000,000 seeds per pound.

OENOTHERA Linnaeus **Evening primrose** *Onagraceae* New Latin, from Latin *oenothera, onothera*, a plant of the related genus *Epilobium*, from Greek *oinotheras, onothera, oenotheris,* the juice of a plant that is drunk in wine to produce sleep. Alternately, wine-scented, from Greek *oen*, grape vine, wine, and ανθηρος, *antheros*, flowering, blooming. Biennial and perennial herbs. The common name is from the flowers being closed during the day and open in the evening. On dark, cloudy, overcast days, the flowers may remain open. A genus of about 124 species of mostly North American (temperate America?) annual or biennial herbs having usually nocturnal yellow flowers with erect buds and terete seeds in two rows in a capsule. The high oil seeds provide valuable food for upland game birds, songbirds and small mammals. Fruit is a capsule with numerous small seeds that are rich in oil. Some species are early successional, part of a persistent, upland, soil seed bank, and behave as weeds.

Seeds ripen in the summer. Plants are mostly self-sterile. Germination is easy from seed with no treatment. Some species seem to be seed bank species and probably require light for germination. Code A. Some are easy by division and all *Oenothera* and *Calylophus* are easily rooted as spring tip cuttings. (Cullina 2000)

Oenothera biennis Linnaeus COMMON EVENING PRIMROSE, aka Evening Primrose, Fever Plant, German Rampion, Hog Weed, King's Cure-All, Yellow Evening Primrose, Weedy Evening Primrose
Habitat: Disturbed areas, most seed banks. Open woods, fields, disturbed areas. Low to moderate moisture requirements,. Coarse to medium soils. Neutral to basic soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant, full sunlight. pH 5.0-7.0.
Culture: A wildly successful plant. No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil. (pm 09) "10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall." (pn nd) No treatment. light or GA3, cold moist stratify or fall planting may help, cool soils. (Why improve the germination of this plant?) Pure stand plant 2 lb per acre. Growth rate rapid. Seedling vigor high. Vegetative spread rate none.
Description: Weedy, native biennial, 2.0-5.0', with fragrant, night-blooming, yellow flowers. Each flowers lasts 1-2 days. 10' minimum root depth.
Comments: This plant may become weedy or invasive in some areas. Blooms 6-10. Interesting dried seed heads. Numerous Ethnobotanical uses. Blooms at night, pollinated by hawk-moths. Hummingbirds visit the flowers for nectar and insects. Many pale flowered species are night bloomers and are pollinated by moths. A preferred food of Japanese beetles. Greens and roots are edible. Valuable for erosion control. This can be showy the second year after seeding, but gradually fades from a planting. On the one hand, it is aggressive and forms large basal rosettes that shade the ground preventing germination. On the other hand, the tap roots place organic matter far into the soil and decompose leaving channels for water infiltration. Seedbank species in many soils, probably an obligate light germinater. 1,376,000 to 1,589,000 seeds per pound.

This plant is commercially cultivated in many parts of the world for its oil that contains two essential fatty acids, linoleic acid and gamma linolenic acid (Kemper 1999). The oil is commonly available in health food stores.

"Very common and variable. We have the species and vars. *pycnocarpa* Atkins & Bartl., and *canescens* T. & G. of Gray's Man. Ed. 8. *O. cruciata* Nutt. is in Boone County so can be expected here." (Fell 1955)

Oenothera clelandii W. Dietrich, P.H. Raven, & W.L. Wagner [*O. rhombipetala* T. & G.] SAND EVENING PRIMROSE, aka Sand Primrose
Habitat: Disturbed open sands, sand prairies.
Culture: Cold moist stratify or fall plant. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Further germination pretreatments not sure? (pm 09)
Description/comments: Yellow flowers pollinated by moths, 2.0-4.0', blooms 6-10, dried seed heads, aggressive. Seed bank species in sandy soils. 1,600,000 to 2,564,971 seeds per pound. "Common in all our sand areas and not infrequent in the sandy prairies around Camp Grant." (Fell 1955 as *O. rhombipetala* Nutt.)

Oenothera missouriensis MISSOURI EVENING PRIMROSE (of Missouri.)
Habitat: Where native, it grows in open prairies, rocky hillsides, along roadsides. Drought tolerant, full sun. Rocky and sandy soils. Low moisture requirements. Coarse to moderately fine soils. Neutral to basic soils.
Culture: 60 days cold moist stratification (pm 09). Blooms second year from seed. In monoculture plant 2 oz. per 1,000 sq. ft. (Stock). Pure stand plant 5 lb per acre.(Granite). Sow any time (pots 2000).

Description/comments: US native, hardy, spreading, perennial, low-growing, 8-10", with, fragrant, large, drooping, 4-petaled, canary yellow flowers that open in the evening, fading the next day, blooming May to September, late spring to early fall. Used for early color in seedings. 75,200 to 92,000 seeds per pound

Oenothera rhombipetala T. & G. WESTERN SAND EVENING PRIMROSE
Many records formerly referred to this species are *O. clelandii*.

OXALIDACEAE R. Brown 1818 **Wood-sorrel Family** 5 to 6 genera of about 500-700 species of herbs, shrubs, and vines.

OXALIS Linnaeus 1753 **Wood Sorrel** *Oxalidaceae* From Greek name for sorrel, from *oxys* acid. A genus of about 500-700 species of hardy and tender herbs, shrubs, and vines. Fruit is a capsule

Oxalis violacea Linnaeus VIOLET WOOD SORREL, aka Bulblet wood-sorrel, Purple Oxalis
Habitat: Hill, gravel, dry, and mesic prairies, open woods, bluffs. "Common in open woods, on low prairies and gravel bluffs. White flowers are not uncommon." (Fell 1955)
Culture: Division, easy from transplants, difficult from seed, fall plant or cold moist stratify. Seed best planted outdoors in the fall, or after 60 days cold moist stratification. (pm 09) The seeds of *Oxalis violacea* are "enclosed in a large transparent appendage that functions in dispersal both in expelling the seed from the capsule and attracting ants." (Cochrane et al 2006) Hydrophilic?
Description/comments: Violet flowers. Blooms 4-6 and remontant 9,10, rock gardens.
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera. Attracts upland game birds, songbirds, small mammals, and in one source waterfowl.

PAPAVERACEAE A. L. de Jussieu 1789 **Poppy Family**

ESCHSCHOLTZIA *Papaveraceae* After Johan Friedrich Eschscholz (1793-1831), Russian botanist. Annual herbs.

Eschscholtzia californica CALIFORNIA POPPY (of California)
Habitat: Any moisture regime. Coarse to moderately fine textured soils. Neutral to basic soils.
Culture: Pure stand plant 8 lb per acre (Granite). Sow anytime (pots 2000).
Description: Western native annual (short lived perennial usually treated as an annual), 12-18", intense orange flowers, blooms spring to summer. Finely divided blue green foliage. Useful in borders, gardens and meadows. 293,000 seeds per pound.

PAPAVER *Papaveraceae* New Latin from the classic Latin name for poppy. Vulgar Latin *papavum* (whence Old French *pavo,* which gave rise to Old English versions of poppy), alteration of Latin *papaver*; perhaps akin to Latin *papula* papule, or pimple, similar to Latin *papilla*, nipple. Bristly annual, biennial, and perennial hairy herbs or occasionally subshrubs with lobed or dissected leaves, long-peduncled often nodding usually large and showy flowers, and a capsular fruit topped by a radiate disk and dehiscent by pores immediately below.

Papaver rhoeas Linnaeus FLANDERS POPPY, aka Corn Poppy
Habitat: Roadsides and rocky fields. Low to moderate water requirement. Full sun to partial shade. Coarse to moderately fine soils. Neutral to basic soils.
Culture: No special treatment, pure stand plant 1 lb per acre.
Description: Introduced annual, 24", with red or mixed flowers from April to June. Fast growing species for wildflower ground cover or mass plantings. 2,445,811 to 3,400,000 seeds per pound.

SANGUINARIA Linnaeus 1753 **Bloodroot** *Papaveraceae* From Latin *sanguis,* blood for the blood red sap. A monospecific genus.

Seeds are hydrophilic and ripen late spring to early summer. Sow seeds immediately outdoors. Transplant after 1st or 2nd growing season. Code D*. Division in early fall. (Cullina 2000)

Sanguinaria canadensis Linnaeus BLOOD ROOT, aka Red Puccoon Root, *Pauson,* Teterwort (of Canada or northeast USA.)
Habitat: Rich woods.
Culture: Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)

Description: One large, sheath-like basal multi-lobed leaf up to 30 cm across; 8-12 delicate white petals and yellow reproductive parts that appear to be clasped by the leaf.
Comments: Blooms 3-4. "Common in moist woods and ravines. Petals often numerous, occasionally pink." (Fell 1955)
Associates: *Sanguinaria* seeds have an external appendage rich in lipids called an eliaosome. The ripe seeds are carried to ant nests where the elaiosomes are consumed by ant larvae. The unharmed seeds are discarded in the nest or in nutrient rich middens.

STYLOPHORUM Nuttall 1818 **Celandine Poppy** *Papaveraceae* **(***Stylophorum* from *stylos*, a style or column, and *pherein*, to bear, referring to one of the distinct characters)

Stylophorum diphyllum Michaux (Nuttall) CELANDINE POPPY, aka Woods-poppy (*diphyllus -a -um* Greek for two-leaved)
The seeds are hydrophilic and ripen in late spring to early summer. It is not necessary to remove the small eliaosomes. Seeds should be sown immediately. Seedlings are vigorous if kept watered and fertilized. Will bloom 2nd spring. Code D*. (Cullina 2000) Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)
"Found in a ravine on Rock Run in Stephenson County but not known in Winnebago County." (Fell 1955)

PENTHORACEAE Rydberg ex Britton 1901 **Ditch-stonecrop Family**
A family of one genus and 2 species, herbs, of e. North America and e. Asia.

PENTHORUM Linnaeus *Penthoraceae* New Latin, from Greek *penta-*, and *-horum*, from Greek *horos* boundary, limit. A genus of 2 herbs of eastern north America and east and southeast Asia, with thin leaves and greenish pentamerous flowers. The other species is *P. chinense* Pursh of east Russia, China, Korea, and Japan.

Penthorum sedoides Linnaeus DITCH STONECROP, aka American Penthorum
Habitat: Drainage ditches, a common, agricultural wetland, soil seed bank species. "Common in wet places." (Fell 1955) Shorelines and ditches. Shores, drawdown areas, moist forests, moist disturbed areas, common (Weakly 2007). Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.0-7.0. distribution widespread in eastern North America.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). Cold moist stratify or fall plant-light. Growth rate slow. Seedling vigor low. Vegetative spread rate moderate.
Description/comments: Yellow green flowers, 0.5-3.0', stoloniferous, united carpels, flowers in loose spikes, and scattered leaves. Blooms 6-10, wetland restoration. 20,800,000 to 75,667,000 seeds per pound.

PHRYMACAEA Schauer 1847 **Lopseed Family** Some recent authors place *Mimulus* Linnaeus in this family.

PHRYMA Linnaeus 1753 *Phrymacaea* From Linnaeus, the origin of the genus name is lost. A genus of 1-2 species of eastern North America and Asia.

Phryma leptostachya Linnaeus LOPSEED (*leptostachyus -a -um* with thin or slender spikes, from Greek *leptos*, thin, slender, delicate, narrow, *-o-*, and σταχυς, *stachys*, spike, an ear of grain.)
Habitat: Mesic savannas and woodlands, hedgerows. "Common in woods." (Fell 1955) In se USA, variety *leptostachya* grows in places primarily underlain with coquina limestone (marl)" (Weakley 2008). The species has a relictual disjunct distribution with variety *leptostachya* in eastern North America and variety *asiatica* Hara in east Asia.
Culture: Cold moist stratify or fall plant. 60 days cold moist stratification. (pm 09)
Description/comments: Pink flowers. 1.0-2.5' "The fruits "lopped down" against the stem are unmistakable" (Weakley 2008) Blooms 6-9. 61,920 seeds per pound.

PLANTAGINACEAE A. L. Jussieu 1789 **Plantain Family** As recently recircumscribed, this family now includes many non-hemi-parasitic figworts, *Chelone, Collinsia, Penstemon*, *Antirrhinum, Chaenorrhinum, Linaria, Misopates, Nuttallanthus*, *Digitalis, Veronica,* and *Veronicastrum.*

PLANTAGO Linnaeus 1753 **Plantain** *Plantaginaceae Plantago* New Latin *Plantagin-, Plantago*, from Latin, plantain; foot-sole-like, feminine termination of *planta*, from classical Latin *plataginem*, for the way the leaves of some species lie flat on the ground, cognate (?) with French *plantain*. "The native or introduced status of many of our species is uncertain or controversial." (Weakley 2008)

Plantago patagonica Jacquin WOOLY PLANTAIN, aka Salt And Pepper Plant

Habitat: Disturbed open sands and blowouts. Adventive in se USA.
Culture: Cold moist stratify. 30 days cold moist stratification (pm 09). Native annuals are best dormant seeded!
Description/comments: 0.25-1.0', green flowers, blooms 5-7, annual. "Rather frequent in Sugar River sand area, on the sandy prairies about Camp Grant and to a less extent on high prairies." (Fell 1955)

POLEMONIACEAE A. L. Jussieu 1789 **Jacob's-ladder Family** A family of 18 genera and 350-380 species of herbs, vines, shrubs, rarely trees, mostly of temperate North America, but extending into tropical America and Eurasia.

PHLOX Linnaeus 1753 **Phlox** *Polemoniaceae Phlox* from the Greek *phlox, -phlox,* a flame, an ancient name of *Lychnis* of the Caryophyllaceae. Annual and perennial herbs, about 70 species herbs to subshrubs in temperate North America, with one species in northeast Asia. Fruit is a capsule.

While in bloom, an inflorescence is likely to have ripe seeds, open flowers, and buds, even though *Phlox* have determinate growth. The seeds of *Phlox* have a large basal appendage that helps in dispersal by expelling the seed from the capsule and attracting ants that carry the seed away (Cochrane et al. 2006).

Best with fresh seed (do not over dry, refrigerate after ripe seed has fallen from drying stems). Fall plant or cold moist stratify stem cuttings division. KNO3 may help some species. At one time, several species were noted as double-dormant. Many seeds formerly classed as double dormant are now classed as hydrophilic.

Seeds are probably hydrophilic and ripen late spring to fall. Plants are self-sterile. Best planted immediately outside. Germination may extend for several seasons. Woodland species will handle some dry storage. If you must, store clean seed in ziplocks to prevent over-drying and loss of viability. Code B or C (*implied). Softwood cuttings from non-flowering stems root easily, such as the evergreen basal shoots of *P. divaricata*. Dry species should be rooted in sand to avoid rot. (Cullina 2000)

Phlox bifida Beck *IA The one, the only, the TRUE SAND PHLOX, aka Cleft Phlox, Ten-point Phlox
Habitat: Sand prairies and sand savannas.
Culture: Division, self sows in sand without grassy competition. 60 days cold moist stratification (Prairie Moon 2008).
Description: White to blue flowers early spring, 5-merous key features "Somewhat shrubby at the base, much branched, forming tussocks; some of the pubescence glandular; corolla cleft." (ilpin)
Comments: Blooms 3-6. C3. Short lived in rich soils, good in rock gardens. "Found only in the sand hills north of Shirland where it grows in the open and in the black oak woods. It does well in the flower garden in a dry sunny place." (Fell 1955)

Sand phlox carpets over-grazed sand hill pastures, to the extent some western Bureau County sand hills appear to be snow covered when this is in bloom. This species appears to survive and increase with cattle grazing, and decreases with burn management without grazing.

Phlox divaricata Linnaeus WOODLAND PHLOX, aka Blue Phlox, Eastern Blue Phlox, Forest Phlox, Timber Phlox, Wild Blue Phlox, Wild Sweet William, Wood Phlox
Habitat: Mesic and dry savanna.
Culture: "Upon ripening in the late spring, sow seeds for germination the following spring. Light cover. Poor to fair germination." (Dunham 1993). 60 days cold moist stratification (pm 09). Genesis best crop used summer planted seed for germination the following spring.
Description: 0.5-1.5', blue flowers, blooms 4,5,6. 200,000 to 239,451 seeds per pound. "Common in low woods. Plants with white flowers are seen occasionally; in Boswell Woods in Pecatonica River Bottom east of Shirland it is plentiful and most of the flowers are white." (Fell 1955)

Phlox drummondii Hooker DRUMMOND PHLOX, aka Annual Phlox
Habitat: Where native fallow fields, open woods, roadsides, and prairies, low to moderate water requirements. Full sun. Moderately coarse to fine soils. Neutral to acidic soils.
Culture: Pure stand plant 10 lb per acre (Granite). Sow in early spring in north or in fall in south. Cover well needs dark to germinate? (pots 2000).
Description: Western native annual, 8-20", with bright rose-red to pastel pink to purple flower clusters atop erect leafy stems May to October. Prolific bloomer, good in low garden beds or as edging. 234,000 to 241,500 seeds per pound. Occasionally used for quick color in seed mixes.

Phlox glaberrima Linnaeus subsp. **interior** Wherry *WI MARSH PHLOX, aka Smooth Phlox
Habitat: Wet meadows and fens.
Culture: 60 days cold moist stratification (pm 09). Easy from cold(?) stratified seed (Robertson).
Description/comments: Pink flowers pollinated by Lepidoptera, Diptera. Calcareous, attracts hummingbirds. Blooms 7-9. Weakley (2007) calls this variety *interior* Wherry. "Found only on low prairies in the southwest corner of the county near the C.B. & Q.R.R. Common in the south part of Boone County. It blooms later than *P. pilosa*." (Fell 1955)

Phlox maculata Linnaeus SWEET WILLIAMS PHLOX, aka Meadow Phlox

Habitat: Fens, peaty wet prairies wet meadows.
60 days cold moist stratification (pm 09). Pink flowers, blooms 7-9, calcareous.

Phlox paniculata Linnaeus GARDEN PHLOX, aka Fall Phlox, Perennial Phlox, Summer Phlox (with flowers in panicles.)
Habitat: Wet prairies, hedge rows, open woods.
Culture: 60 days cold moist stratification (pm 09); cool soils, double dormant.
Description: Pink to white flowers, most colonies have a range of colors. 2.0-3.0'. Blooms 6-9. Cut flowers, landscaping, aggressive. Native somewhere, but not northern Illinois. Most populations are escapes from cultivation, but we are within the plants natural range. One population in our area (Buda) appears native, or very thoroughly naturalized in a wet prairie. Populations are persistent under burn management, and are slowly, somewhat invasive; in 15 years this has 'jumped' from our hedge row to the back woods, a leap of about 1000 feet, with nothing in between.
"We do not think this is native in this county but it escapes very freely and spreads and persists indefinitely on roads and in old fields." (Fell 1955)

Phlox pilosa PRAIRIE PHLOX, aka Downy Phlox
Habitat: Mesic, hill, and dry prairies, sand savannas.
Culture: Double dormant (an old, often heard reference to seeds now classed as hydrophilic). "Fall sow or sow fresh seed for germination the following spring, or cold moist treatment. Light cover. variable, poor to good germination." (Dunham 1993) Easy from moist stratified seed. 60 days cold moist stratification (Prairie Moon).
Description: White to pink flowers pollinated by long-tongued bees, Diptera, Lepidoptera, 1.0-1.5', blooms 5-9. Attracts butterflies, small mammals, game birds, can be subject to pests. 300,000 to 411,200; seeds per pound.

POLEMONIUM Linnaeus *Polemoniaceae* Phlox family. New Latin from *polemônion*, Greek name for a plant, possibly Greek Valerian, or possibly *Hypericum olympicum* or *Mentha longifolia.* A genus of about 25 species of perennial herbs of the temperate regions of North America having pinnate leaves and large cymose-paniculate flowers with herbaceous calyx, declinate stamens, and mucilaginous seeds.
Seeds of woodland species are hydrophilic and should be cold moist stratified and not dry stored. Alpine species can be dry stored and spring planted. Plants are self-sterile. Code A or D*. Old crowns can be divided after flowering. (Cullina 2000)

Polemonium reptans Linnaeus *MI JACOB'S LADDER, aka Greek Valerian (creeping, from Latin *reptans,* from *repto*, *reptare*, to creep, crawl along)
Habitat: Generally considered a woodland plant but grows in fens, mesic prairies, mesic savanna as well as low moist woodlands. "Common on low prairies and in moist woods." (Fell 1955)
Culture: "Fall sow or cold moist treatment. Light cover. Good to fair germination." (Dunham, 1993) Prairie Moon (2009) calls for 60 days cold moist stratification. Plant fresh seed or cold moist stratify fresh seed. Fall plant properly stored seed, division in spring, root cuttings. Germination may be delayed several seasons. (*We have plants in our front field where we dumped flats in 1995 and disked in the used potting soil, which was full of ungerminated seed. The area was disked deeply several times, with what seems to be no apparent chance of seed being at a germinable depth, but some seeds grew and plants are there. Not exactly light cover. Definite proof anything works once. DL*)
Description/comments: 1.0-1.5', blue flowers, pinnate leaves. Bloom 4-6. 288,000 to 361,897 seeds per pound.

POLYGONACEAE A. L. de Jussieu 1789 **Smartweed Family**

Fagopyrum esculentum Moench. [*F. tartaricum*] BUCKWHEAT, aka Goose Buckwheat, India-Wheat
Habitat: Poor soils, wastelands, mud, peat, light sandy soils. Fields, roadsides, old fields. Tolerates poor soil, with minimal nutrient needs.
Culture: Available in May, June, early July. Anon (1981) recommends 25 lbs per acre. Needs warm soil to germinate. Sow in late spring or summer cover crop. This is not a nurse crop. 1-2 lbs per 1000 (pots 2000). 1 lb per 500 sq ft or 50 lb per acre.
Description: Annual, sometimes used as a nurse crop or erosion control or commonly as a green manure. To 24" in garden soil. Aggressive plant if well watered. Should be tilled in when flowering begins (5-6 wks after planting). Do not let go to seed! Roots are brittle, and easily chopped. Easy cover crop to work in. Helps control weeds, and helps make phosphates more available (pots 2000). Dense growth habit said to smother weeds, even thistles. Helps accumulate insoluble phosphorus in soils. (Territorial 2001). Upland game birds, songbirds, terrestrial furbearers (esp. squirrels), small mammals and deer eat seeds. Good bee plant, makes a strong dark honey.

POLYGONUM Linnaeus 1753 **Smartweed, Knotgrass** *Polygonaceae* Buckwheat family New Latin, from Greek *polygonon* knotgrass *Polygonum aviculare,* from Greek *polys* many and *gony* a knee for the jointed stems. Annual and

perennial herbs and climbers having prominent *ocreae* (tubular sheathing stipules), thickened nodes, and flowers that are solitary and axillary or in spiked racemes. Seeds are achenes.

Several species are planted as wetland nurse crops. They should be included as a source of food and cover for wildlife, but wide-leaved, ground shading dicots are not good nurse crops. Smartweeds are part of many long-term wetland seed banks. Smartweed seed supplies vary widely from year to year.

Polygonum amphibium (*Polygonum amphibium stipulaceum*) WATER SMARTWEED, aka Water Knot Weed (growing in water or on land.)
Habitat: Wide tolerance for inundation, 20" water to moist soil. pH 5.4-8.8. Nutrient load tolerance moderate, salt tolerance low, siltation tolerance moderate to high. Partial to full sun.
Culture: Can be established from seeds (*if you can find them)*, cuttings, or rhizomes. Seeds can be stored in freshwater, 32-34°F for 3-6 months to stratify, if you can find them. One source says seeds germinate best when stored dry at 40°F. followed by light at 70 °F. Can be field sown on wet soils in spring. Seed production is enhanced by shallow flooding during summer. Seeds mature July to September. On that magical day in the future when as much seed as every body wants is available, in mixes sow 0.5-1.5 lb pls per acre (USDA 1997). For now, do not list this in seed mixes.

Plants and rootstocks limited availability. 2-6" stem cuttings can be directly stuck in moist soil in field. Spring drawdown increases plant production. (USDA 1997)
Description/comments: Perennial emergent herb, up to 3', red to pink flowers blooming in June to August. 50,000 seeds per pound. Seed of this species is seen as about often as fern seed. Waterfowl eats seeds. Major food source for purplish copper butterfly (nectar or larval???). Provides cover for waterfowl and fish.

Polygonum lapathifolium Linnaeus HEARTEASE, aka Curltop Ladysthumb, Curlytop Smartweed, Pale Smartweed (from Greek *lapathon, lapathos*, name for Monk's Rhubarb, *Rumex Patientia*, and dock, *Rumex conglomeratus*, and Latin *folium*, a leaf.)
Habitat: Agricultural wetlands, ditches, stream banks swampy thickets, shores, damp clearings, and cultivated fields. "A common smartweed" (Fell 1955)
Culture: No treatment, but seeds will benefit from fall planting. This species forms part of the long term wetland soil seed bank.
Description/comments: Annual native, 1-3', pink to white flowers. This plant is considered invasive. Blooms 6-10. Attracts upland game birds and waterfowl. 220,360 to 320,000 seeds per pound.

Polygonum pensylvanicum Linnaeus GIANT SMARTWEED aka Heart Seed, Pennsylvania Smartweed or Knotweed, Pinkweed, Pinweed (a typo perhaps?)
Habitat: Farmed wetlands, fens, wet prairies, damp shores, thickets, clearings, and disturbed or cultivated soil, fresh moist margins, banks, muddy spots, shallow water areas. Fresh, moderately brackish, or alkaline water. Thickets, clearings, old fields. "A common smartweed" (Fell 1955) Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 4.0-8.0.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09 possible typo? seeds are not small and appear to have a hard coat and assumed physiological dormancy, but photodormancy is probable also). No treatment is traditional, but some lots may be highly dormant. Throw it out and let nature handle it. Anon 1981 says plant spring or fall. 20 lbs. per acre broadcast. USDA 10-15 lbs per acre broadcast. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. This species forms part of the long term wetland soil seed bank.
Description: Annual, to 3.9 feet, red flowers. 14"minimum root depth.
Comments: This species is considered invasive in many areas. Blooms 6-10. Availability may swing wildly from year to year, abundant to non-existent. 113,614 to 267,000 seeds per pound.
Associates: Said to attracts upland game birds and waterfowl. Waterfowl (20 species of ducks), geese, marsh birds, shorebirds, upland game birds (bobwhites, mourning doves, pheasants, four species of rails, songbirds (30 non-game species), and small mammals (white-footed mice) eat seeds. Aquatic and terrestrial furbearers (muskrats, raccoons, and fox squirrels) eat plants and seeds. Everitt, J.H., D.L. Drawe, and R.I. Lonard. 1999, note that this species is of low food value and of no cover value for any wildlife. Texan critters must have discerning palates.

Polygonum virginianum Linnaeus JUMPSEED, aka Woodland Knotweed
Habitat: Wooded floodplain terraces, woodland edges, and mesic savannas.
Culture: Fall plant or cold moist stratify. 60 days cold moist stratification (pm 09). Seeds have physiological dormancy, germinate after cold moist stratification at 30º/15º C. Germination best in light. (Baskin & Baskin 2002)
Description: general form Annual or perennial culms 1.0-2.0' leaves alternate, simple, entire flowers a raceme of white flowers 4-merous, followed by white seeds N 2n = 44. key features very slender racemes.

Comments: Blooms 7-9. Some websites are now listing this as *Antenoron virginianum* (Linnaeus) Roberty & Vautier. 69,653 to 103,088 seeds per pound. "Irregularly distributed. When found it is usually in large patches on damp roadsides or in woods. It is best known from "shooting" its seed in the fall when the dry capsules are touched." (Fell 1955)
Associates: Possible cause of hayfever and dermatitis in humans.

RUMEX Linnaeus 1753 **Dock** *Polygonaceae* Buckwheat family. New Latin, from classical Latin name for sorrel used by Pliny, also a name for a missile weapon, similar to the *sparum* of the Gauls. About 200 species of perennial and annual herbs and shrubs that are mainly native to north temperate regions and have small flowers in axillary clusters often aggregated in a large panicle and 3-angled wingless fruit enclosed in a persistent perianth whose inner segments often bear conspicuous tubercles. x = 7,8,9,10 (polyploidy common)

Rumex altimissus A. Wood PALE DOCK, aka Tall Dock, Peachleaf Dock, Smooth Dock. Water Dock.
Habitat: Low ground along streams and drainage ditches,
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Moist soil, light, no treatment or fall plant, cool soils.
Description/comments: Green flowers 3.0-7.' 2n = 20. Blooms 5-7, wetland restoration. "A common weed of fields and roadsides preferring rich soil." (Fell 1955) 220,656 to 240,000 seeds per pound.
Associates: Wind pollinated, possibly allergenic. Non-mycorrhizal.

Rumex orbiculatus A. Gray GREAT WATER DOCK
Habitat: Wet meadows, fens.
Culture: 60 days cold moist stratification (pm 09). Light, fall plant or cold moist stratification, cool soils.
Description/comments: White flowers, 4.0-7'. Blooms 6-8. Wetland restoration, calcareous soils. 145,008 to 238,736 seeds per pound.

Rumex verticillatus Linnaeus *MD, MA SWAMP DOCK (whorled, from Latin *verticillus*, adjective, the whirl of a spindle, and *–atus*, adjectival suffix for nouns, possessive of or likeness of something)
Habitat: Drainage ditches.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09).
Comments: Blooms 6-9. Provides food for ruffed grouse, deer, and cottontail rabbits. 126,000 to 160,000 seeds per pound. "Very common in Sugar River and Pecatonica River sloughs and less common in similar situations throughout." (Fell 1955)

TOVARA see *Polygonum*

PONTEDERIACEAE Kunth 1816 **Pickerelweed Family**

PONTEDERIA *Pontederiaceae* New Latin, from Giulio (or Guilo) *Pontedera* (1688-1757 professor of botany at Padua and New Latin *–ia*. American aquatic, perennial, herbaceous plants having leaves with long sheathing petioles and flowers in a dense spike. Seed availability may vary widely from year to year.

Pontederia cordata Linnaeus *KY PICKERELWEED (for the heart-shaped leaves.)
Habitat: Mucky fairly fresh soil, shallow ponds, streams, marshes. Swampy edges of lakes and streams, tidal shores. Fresh or slightly brackish water. 1'-3' deep. Anaerobic tolerance high. CaCO3 tolerance medium. No drought tolerance. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 6.0-8.0.
Culture: Seed is recalcitrant, store cool and wet. Plant April to November (Anon 1981) 600 roots per acre on 3'-4' centers (math is not their strong suit). Ernst recommends 1 lb per 1000 square feet. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
Description: Perennial, aquatic herb growing in shallow water of streams and ponds and having spikes of blue flowers and cordate or sagittate leaves.
Comments: Blooms 7-9. 4167 to 34,496 seeds per pound. Although this is a monocot and distantly related to grasses, it is not a grass as some nurseries say. "In Sugar Creek sloughs west of Shirland and in a Killbuck Creek slough at U.S. RT. No. 51." (Fell 1955)
Associates: Provides food and cover for wildlife. Waterfowl eat seeds and plants. Aquatic furbearers (esp. muskrats) eat seeds and plants. Fish utilize cover.

PORTULACACEAE A. L. de Jussieu 1789 **Purslane family**

CLAYTONIA Linnaeus **Spring Beauty** *Portulacaceae* New Latin, from John *Clayton* (1686-1773) Virginia botanist and New Latin *-ia*. Mainly North American succulent herbs having corm-like or thickened roots and a single pair of

leaves.

Claytonia virginica Linnaeus SPRING BEAUTY, aka Virginia Spring Beauty
Habitat: Mesic prairies, savannas, and woods. "Common in mesophytic woods but rare in the sand area." (Fell 1955)
Culture: Seeds are hydrophilic, dry for a few days and plant immediately. Slow from seed. Will self sow. Code D* (Cullina 2000) Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm 09).
Comments: Seed matures early summer. Pollinated by long-tongued bees, short tongued bees, Diptera, Lepidoptera. Easy by seed, spreads by rhizomes (?), fruit is a capsule with small black seeds, attracts small mammals.

PORTULACA Linnaeus 1753 **Purslane, Portulaca** *Portulaceae*

TALINUM Adanson 1763 Fame flower, Jewels-of-Opar *Portulaceae*
The tiny seeds ripen in summer as the capsules yellow. Germinates easily after cold moist stratification. Seedlngs bloom 1st year. Code B, H. (Cullina 2000).

Talinum calycinum ROCK PINK
60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)

Talinum rugospermum Holz. PRAIRIE TALINUM, aka Flame Flower.
60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
"Rare. Known only in the Sugar River dune area; north of Yale bridge, below Sugar River Forest preserve and on the brim of the sand pit near Winslow bridge west of Shirland. More common at Castle Rock in Ogle County." (Fell 1955)

PRIMULACEAE

DODECATHEON Linnaeus 1753 **Shooting Star, Bird Bills** *Primulaceae* New Latin, from Greek *dōdekatheon* primrose, from neuter of *dōdekatheos* of twelve gods, from *dōdeka-*, *dodeca-,* twelve, and *theos, thios* god. The genus name is also spelled *Dodekatheon.* A genus of 13-15 species of North American and northeast Asian herbs having basal leaves and scapose nodding flowers with reflexed corolla and monadelphous stamens. Mast et al. (2004) have shown that *Dodecatheon* is part of *Primula*, and is derived from and closely related to *Primula* subgenus *Auriculastrum,* evidently from a fairly simple alteration of the corolla for buzz pollination.

Seeds mature in early summer and need brief cold moist stratification. Seedlings are slow growing, producing only on true leaf the first year, and going dormant in hot dry weather. Cullina (2000) recommends carefully keeping the seedlings growing as long as possibly through frequent light fertilizing and consistent moisture. Mature clumps can be carefully separated. Root cuttings taken before growth starts in the spring work well.

Dodecatheon amethystinum
Cold moist stratify for 60 days and sow on top of soil (Wade). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil. Best planted outdoors in the fall. (pm 09) 1,440,000 seeds per pound.

Dodecatheon meadia Linnaeus *MI SHOOTING STAR (*meadia* for Richard Mead (1673-1754), English physician and botanical patron.)
Habitat: Mesic, dry, and sand prairies, mesic and dry savanna, woods, also in calcareous fens. "Common on railroads, in thin woods and on high and low prairies." (Fell 1955)
Culture: "Cold moist treatment or fall sow. Germination best in cool soils. Sow early spring or late fall. Very light cover. Grit works well. Best sown in individual pots to avoid transplanting. The slow growing seedlings are better for outplanting the second year, having been over wintered in cold frames. Plants go dormant in mid-late summer. Avoid over watering." (Dunham 1993) 21 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil. (pm 09) "30 days moist stratification necessary for germination. Field sow fall." (pn nd) Sow in fall or cold moist stratify 30 days. Fall plant or cold moist stratify (20 days), light, successional restoration, division, temperature sensitive, cool soils, easy from fresh or stratified seed.
Description/comments: Showy spring flowers, white to lavender flowers pollinated by long-tongued bees, Lepidoptera 1.0-1.5'.

Comments: Blooms 4-6. Seeds mature in early summer. Cut flowers, dried seed heads, landscaping, rock gardens, attracts small mammals, songbirds. 960,000 to 1,936,304 seeds per pound. Fruit is capsule with small seeds.

LYSIMACHIA Linnaeus 1753 **Loosestrife** *Primulaceae* New Latin, from Latin, a plant, from Greek *lysimacheios* loosestrife, from *Lysimachos,* Lysimachus, Greek doctor, *fl* 5th or 4th century B.C.; or after King Lysimachos, of Thrace (c 360-281B.C.) whose name means ending strife, is said to have pacified a bull with a piece of loosestrife. A cosmopolitan genus of about 150 species of perennial herbs, rarely shrubs with leafy stems, leaves opposite or whorled, and yellow flowers.

Lysimachia ciliata Linnaeus FRINGED LOOSESTRIFE (fringed with hairs, for the petioles)
Wet meadows, mesic prairies, wooded floodplains, upland swamp.
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant-light-cuttings-light.
Description: 1.0-3.0', yellow flowers, blooms 7-8. "The most common species. Frequent in damp places." (Fell 1955)

Lysimachia hybrida RIVER LOOSESTRIFE, HYBRID LOOSESTRIFE
Habitat: Marshes.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09).
Description: Yellow flowers, 2-3'. Blooms July, August. 1,040,000 to 1,123,723 seeds per pound.

Lysimachia quadriflora Sims NARROW-LEAVED LOOSESTRIFE, aka Four-flowered Loosestrife, Smooth Loosestrife
Habitat: Wet savannas.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: 2.0-4.0'. Blooms 6,7,8 1,408,000 to 1,440,000 seeds per pound.

Lysimachia thrysiflora Linnaeus TUFTED LOOSESTRIFE (with flowers in a thryse, a type of inflorescence, from Latin *thrysus*, a staff.) Europe, Asia, North America.
Habitat: Marshes, bogs, shallow shaded stagnant pools.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: "A peculiar looking plant because of its simple succulent stem and much reduced lower leaves. It grows in shallow water and very marshy places in Coon Creek bottom. Also known in the boggy places in Boone County north of Capron." (Fell 1955)
Comments: Blooms 5,6. 1,312,000 to 1,520,938 seeds per pound.

RANUNCULACEAE A.L. de Jussieu 1789 **Buttercup** Family. A family of ca. 62 genera and 2450 species of herbs, shrubs, and vines, of temperate and boreal regions. The Buttercup family has many species with hydrophilic or recalcitrant seeds. Care must be taken in their use in restoration.

ACTAEA Linnaeus 1753 ☠ **Baneberry, Cohosh, Herb Christopher, Necklace-weed** *Ranunculaceae* From Pliny, from Greek *aktea*, an old name for the elder, for the similar leaves, and from its wet habitat. Fruit of both species is poisonous, or at least unpalatable.

Freshly harvested seed planted within a few days germinates about half the following spring and the rest a year later. Dried seed takes two or three years to germinate. Cullina 2000 code B or C*, G. Seeds are hydrophilic and mature mid- to late summer. Transplant in spring to a lightly shaded spot.

Actaea pachypoda Elliott DOLL'S EYES, aka White Baneberry, White Cohosh (From Latin *pachys, pachy*, thick, fat, and *pus, pod*, foot, meaning thick stalk, for the thick pedicles.)
Habitat: Mesic woods, mesic woodland, moist soils.
Culture: Seeds require multiple alternating cold moist stratification and warm moist stratification (pm 09). Wash clean 40-70-40 (85-90% in 3-6 wk.) with fresh seed, 70-40 (85-90% in 3-6 wk.) with seed dry stored 6 mo. 70 or 40. Seeds outdoors in August germinated 25% in November and March and April. Fresh seed, fall plant, double dormant, division difficult.
Description: general form Erect perennial culms 1.5-2.5 ft leaves alternate; 2-3 times 3-parted into separate, sharply toothed, oval-oblong leaflets, usually hairless on the bottom flowers white, 4-10-merous, petals falling off leaving numerous white stamens; mature stigma as wide or wider than the ovary; inflorescence a 2" dense, long-stalked cluster usually longer than wide; fruit a several seeded, white berry, occasionally red, on a pink to red, very thick stalk key features Mature stigma as wide or wider than the ovary; white berry on a pink to red, very thick stalk; leaf 3-parted, hairless on the bottom.

Comments: Blooms 4-6. White flower, followed by chalky white fruit with an "eye spot" formed by the persistent stigma. 48,786 seeds per pound. Fruit is poisonous. "Uncommon in rich woods and ravines. Spring Creek woods, the "dells" of Hall Creek and the Kishwaukee River ravines above New Milford. We have not seen red berries on this species. (*A. pachypoda* Ell.) " (Fell 1955 as *A. alba* (L.) Mill)

Actaea rubra (Aiton) Willdenow RED BANEBERRY, aka Snakeberry (From Latin *ruber, rubr-,* red, ruddy.)
Habitat: Woods and thickets. Moderately moist woods and forests, in rich soil.
Culture: "Cold moist treatment, very light cover." (Dunham 1993) Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period (pm 09). Extended germ for fresh seed. 40-70-40 18% in 4-6 weeks for seed dry storage 6 months 40 and 40-70-40 4% seed dry storage 6 months at 70. (Deno 1993).
Description: general form Erect perennial culms 1.5-3.0' leaves alternate; 2-3 times 3-parted into separate, sharply toothed, oval-oblong leaflets often with some hairs in the bottom flowers white, 4-10-merous; petals falling off leaving numerous white stamens; mature stigma narrower than the ovary; inflorescence a 2" ball-like, dense, long-stalked cluster usually about as wide as long; fruits are several-seeded, red berry, occasionally white, on greenish, thin stalks key features Mature stigma narrower than the ovary; red berry on green thin stalks; leaves three-parted.
Comments: Blooms 5-6. 544,000 seeds per pound. "Less common than the above (*A. pachypoda*), in the same places, especially the ravines above New Milford. The albino forma *neglecta* (Gillman) Robins is quite unusual." (Fell 1955)

ANEMONE Linnaeus 1753 **Anemone, Windflower, Pasqueflower** *Ranunculaceae* Wind flower, a name used by Theophrastus, from Latin and Greek *anemōnē*, from *anemo, anemos*, the wind, for it was thought that the flowers did not expand until beaten by the wind; or a corruption of the Semitic name for Adonis, *Na'man* (*Na'amen, Naàmān*). His blood is said to have given rise to the blood red flowers of *A. coronaria*. Alternately from the nymph Anemone who was turned into a flower by a jealous goddess, and forever buffeted by the north wind. Herbaceous genus (rarely shrubs) of about 140-200 species widely distributed in the more temperate and subarctic regions of Eurasia, North America, Central America, South America, and Africa, that have lobed or divided often-involucral leaves and showy flowers that lack petals but have showy sepals. *Hepatica* and *Pulsatilla* are sometimes placed in this genus. Most anemones are fond of limey soils. Many cultivated species are tuberous. Some species have hydrophilic seed.

Many members of the *Anemone* genus contain protoanemonin, an irritating acrid oil that is an enzymatic breakdown product of the glycoside ranunculin. While protoanemonin can cause severe topical and gastrointestinal irritation, it is unstable and changes into harmless anemonin when plants are dried or heated.

Rhizomatous and tuberous anemones produce seeds that are hydrophilic, Code B or Code C*. Most cespitose or caudex-forming species have semi-recalcitrant seeds that decline in viability after six months. Seeds mature late spring to mid-fall, depending on the species.

Anemone canadensis Linnaeus *CT, KY, MD, TN CANADA ANEMONE, aka Meadow Anemone (of Canada or northeast USA.)
Habitat: Wet meadows and prairies, mesic prairies, mesic savanna, open woodlands, calcareous and alluvial soils. Damp thickets, streamsides and ditchbanks. "Common, growing in large patches on low prairies, roadsides, and other damp places." (Fell 1955)
Culture: Easy from fresh seed sown as soon as it is ripe or cold moist stratified seed. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. (pm 09) The seed should be treated as hydrophilic. Easy by division at any season.
Description: White flowers, 1.0-1.5'.
Comments: Blooms 5-9. Landscaping. Can be aggressive, rhizomatous, forms large colonies quickly in rich soil. 128,000 to 205,802 seeds per pound. Seed is an achene.
Associates: Pollinated by bees and syrphid flies. The plant is self-fertile. Plants seem immune to rabbit predation.

Anemone caroliniana Walter *IN, WI CAROLINA ANEMONE, aka Prairie Anemone (of Carolina)
Habitat: Sand and limestone prairies, dry rocky barrens. Does not like tall or aggressive competition. "Found infrequently in dry open places and on prairies and hills." (Fell 1955)
Culture: Fresh seed should be planted within days of ripening, cool soils, division. Cullina code B*
Description: 2.0-8.0'. White, pink, purple, or deep blue flowers. Blooms April and May, the first prairie flower to bloom for those south of the native range of Pasque Flowers. The easternmost species of the tuberous type anemones. The plants go dormant in the summer, with new foliage emerging in the fall and overwintering. Non-competitive, does not like tall competition, calcareous soils. 2,268,000 seeds per pound, cottony plumed achene.

In the sand country of Bureau and Whiteside counties, this is our first spring flower of the prairies. Because its foliage hugs the ground, this plant may persist in odd places. We have found Carolina Anemone in a well-kept sandy cemetery, a mowed natural area parking lot, in thick colonies of prickly pear cactus, and in a degraded prairie pasture severely overgrazed by horses.

Anemone cylindrica A. Gray *OH THIMBLE WEED, aka Long Fruited Anemone, Long-Headed Anemone (*cylindraceus -a -um* cylindric, of cylindrical form.)
Habitat: Dry and mesic prairies, hill and sand prairies, open woods dry open soil, prairies, and slopes, sandy fields and barrens, open sandy woods. Clay soils.
Culture: "Cold moist treatment, or cold treatment, or dry stored, or fall sown. Prefers cool soils: sow in fall or early spring. Light cover. Variable germination." (Dunham 1993). No pre-treatment necessary other than cold, dry stratification (pm 09). "30 days moist stratify improves germination, but not necessary. Field sow fall or spring." (pn nd) Easy from dry stratified seed, dry storage (180) / cold moist stratify or fall plant, cool soils, division.
Description/comments: White flowers, pollinated by bees and syrphid flies. 1.5-2.0', blooms 6-8. Attractive dried seed heads. Ethnobotanical uses, landscaping. 363,000 to 794,401 seeds per pound, cottony plumed achenes. The defluffed seed is tannish-gray, and larger than the similar brownish-black *A. virginiana*.

Anemone patens Linnaeus var. **wolfgangiana** (Besser) Koch) PASQUE FLOWER, aka Hartshorn-Plant, Prairie Crocus, Prairie Smoke (*patens,* spreading, the variety is named for its discoverer Friedrich Wolfgang, 19th century botanist)
Habitat: Limestone and dry prairies, gravel hill prairies. Calcareous soils. Pots (2000) says cool moist soil???? but they're in a desert.
Culture: "Sow shortly after ripening for germination the same year, or cold moist treatment 14-21 days to 60 days. Do not over mist/water. Variable germination." (Dunham 1993) 60 days cold moist stratification (pm 09). Fresh seed is nondormant and germinates shortly after sowing. Cold moist stratify. Some suggest dry stratified seed (14-21 to 60 days). Sow in fall or cold moist stratify 30 days and spring plant. Dried stored seed produces green house crop (gni); careful division.
Description: Perennial herb, 0.5-1.0' "Rather frequent on dry hill-tops, gravel bluffs, and upland prairies. Usually in very expsed places. The gravel hills north of Forest Hills Country Club, hill-tops east of Roscoe, the limestone hill east of Lovejoy school north of Loves Park. This and *Hepatica* are our first spring flowers." (Fell 1955)
Comments: Flowers in early spring, 4-5, followed by feathery seed heads. Rock gardens, non-competitive, does not tolerate shade or moist soils. 288,000 to 806,400 seeds per pound. This plant, like *Geum triflorum*, is limited the the northern tiers of counties in Illinois. This 'boreal' aspect may limit this species use in roof gardens, where it is best established from plants.
Associates: Pollinated by bees and syrphid flies.

Anemone virginiana Linnaeus *RI TALL ANEMONE, aka Large Anemone, Tall Thimbleweed (Virginian)
Habitat: Mesic savanna, disturbed woodlands. Dry open woods, wooded slopes, and woodland edges. Moderate shade tolerance.
Culture: No pre-treatment necessary other than cold, dry stratification (pm 09). Cold moist stratify or fall plant, cool soils, division. Slowly self sows.
Description: Attractive white flowers. 2.0-3.0' Blooms 6-8. Attractive dried seed heads, ethnobotanical uses, landscaping, calcareous. 228,700 to 664,714 seeds per pound. The defluffed seed is brownish black, and smaller than the similar, tannish grey *A. cylindrica*. "Open woods and rocky river banks. More common than *A. cylindrica* which has longer heads." (Fell 1955)

ANEMONELLA Spach **Rue Anemone, Windflower** *Ranunculaceae*

Anemonella thalictroides (Linnaeus) Spach RUE ANEMONE
Habitat: Woodland edges, moist to dry. "A common woodland spring flower." (Fell 1955)
Culture: Seeds are hydrophilic and mature early summer. Harvest and sow as soon as ripe. Viability declines after 3-4 weeks of storage. Transplants must have crown at the surface to avoid rot. Tubers can be separated from the mother plant while dormant. (Cullina 2000) In order to germinate, seeds need a warm, moist period followed by a cold, moist period. Plant fresh seed or keep moist. Refrigerate in a ziplock bag until planting or starting other treatment. (pm 09) Dust with limestone every few years.
Description: general form Erect perennial roots small cluster of tubers culms 4-8", hairless, slender leaves stalked basal leaves 2 times 3-parted with distinct, rounded leaflets, leaflet lobes with teeth towards the tip flowers flowers pink to white, 5-10-merous, 1/3"-1 1/4" wide, petal-like sepals; in few-flowered, umbel-like cluster.
Comments: Seeds mature early summer. Plants go dormant in summer heat, but may continue to bloom if given sufficient moisture. Too much moisture in summer and fall may cause crown rot. 208,000 to 215,008 seeds per pound.

AQUILEGIA Linnaeus 1753 *Ranunculaceae* The name is from either Latin *aquila*, eagle, for the curved spurs resembling eagle claws, or *aqua*, water and *legere*, to collect, for the fluid at the base of the spurs. The common name columbine stems from the Latin name for doves. A genus of herbs having irregular, showy spurred flowers. "One of the most valuable perennials, grown for its attractive foliage and pretty, spurred flowers, which are unequaled for their

grace and color". Prefers light sandy soils, with some shelter. The red-flowered species are pollinated by hummingbirds.

Germination slow and erratic, best below 65° in bright indirect light. Sow October to February, or give 3 weeks cold treatment (JLH). Pots (2000) says sow in fall or stratify 30 days and spring plant.

Cullina (2000) recommends outdoor treatment. Code B.

Aquilegia canadensis Linnaeus *FL WILD COLUMBINE, aka Canada Columbine, Cluckies, Common American Columbine, "Honeysuckle", Jack-In Trousers, Rock Lily, Wild Honeysuckle (of Canada or northeast USA.)
Habitat: Mesic savanna, prairie edges, rocky woods, sandy areas. Rocky, wooded or open slopes. Best in areas that are moist in the winter and spring, but dry out on the summer. Moderate to high water requirements. Full sun to partial shade. Medium to high moisture. Moderately coarse to moderately fine soils. Neutral soils, some acid tolerance, pH 5.0-8.0.
Culture: "Cold moist treatment or fall sow. Very light to light cover. Good germination, not reliable." (Dunham 1993). 60 days cold moist stratification (pm 09). Germinates in 20-50 days. Germination best with GA3 (JLH). Seed sown early might bloom first year, "easy from scarified seed and dry stratified seed" (according to Robertson). Genesis 2nd best germination 3/96 with winter sown seed brought into green house in March, best 3/2002 greenhouse sown, hit with GA3 (ProGib) (gni). "30 days moist stratification improves germination, but not necessary. Field sow fall, early spring." (pn nd) Fresh seed should be stored at 5º-6º C (41ºF) for up to 4 months. Cold moist stratify (30 days, or 3-4 weeks) @ 5ºC may help germination. Light, GA3, division, successional restoration. Self sows, scattering fresh-picked seed helps increase stands. Pure stand plant 4 lb pls per acre (Granite).
Description: Native perennial, 1.0-2.5', with nodding red and yellow flowers.
Comments: Blooms 4-7. Seeds mature early summer. Plants die back to a few basal leaves during the summer. Excellent cut flowers, attractive dried seed heads, ethnobotanical uses, landscaping. 400,000 to 630,556 seeds per pound, follicles with black shiny seeds. "Common in a variety of habitats and showing many variations." (Fell 1955)
Associates: Attracts hummingbirds their pollinator. In the northern Midwest four species of hummingbirds visit this plant. Nectar source for butterflies. *Aquilegia* is the only larval food for the Columbine Duskywing (*Erynnis lucilius*). May develop crown rot and leaf spot if over-watered in the summer. Subject to root and crown borers. "Tracks" in the leaves are due to Columbine Leaf Miners.

CALTHA Linnaeus 175 **Marsh Marigold, Cowslip** *Ranunculaceae* From a Latin name for a strong-smelling yellow flowered plant, from *calathos*, cup. Aquatic and marginal perennials.

Caltha palustris Linnaeus MARSH MARIGOLD, aka Cowslip, King Cup (*palustris -is -e* of swamps, or growing in bogs)
Habitat: Swamps, wet woods, wet meadows, and fens.
Culture: Seeds are hydrophilic. "Sow immediately on ripening. If seed must be kept, do not permit it to dry. Store in a plastic bag in the refrigerator until ready to sow. Cold moist treatment has been recommended by some, but in my experience, fresh sown seed is best. Light cover." (Dunham 1993) Fresh seed must be sown or cold moist stratified immediately. Seedlings do well as potted plants as long as they never dry out. Crowns can be divided in early spring before growth or in summer when dormant. Code D* (Cullina 2000) In order to germinate, seeds need a warm, moist period followed by a cold, moist period. Further germination pretreatments not sure? (pm 09) Plants will self sow in appropriate habitats.
Description: 1.5-2.5'. Yellow flowers.
Comments: Blooms 3-6. Seeds mature late spring to early summer. Ethnobotanical uses, wetland restoration. 416,000 to 976,640 seeds per pound. "Uncommon in wet places. At times it blooms again in the fall." (Fell 1955)

CIMICIFUGA Wernischeck 1763 **Bugbane, Black Cohosh** *Ranunculaceae* This is sometimes placed in the genus *Actaea.* New Latin, from *Cimic-, Cimex*, a bug, and *-i-* and *-fuga –fuge*, from *fugo*, to repel. *C. foetida* has been used as an insect repellent. Perennial herbs having two or three ternately divided serrate leaves and white flowers in long rod-like racemes.

Do not allow seed to dry. Plant fresh seed immediately in a warm location, maintaining warmth, place in coldframe in February.

Cimicifuga racemosa (Linnaeus) Nutt. *IL, MA BLACK COHOSH, aka Black Bugbane,Black Snakeroot (New Latin from *racemus*, the stalk or a cluster of a bunch of grapes, and *–osus,* plenitude or notable development, with racemes.)
Habitat: Moist forests, wooded slopes, ravines, woodland openings.
Culture: 60 days cold moist stratification. In order to germinate, seeds need a warm, moist period followed by a cold, moist period. (pm 09) Seeds are hydrophilic. May self sow.

Description: 3-8', racemes of white flowers.
Comments: Blooms 6-8. Seed matures late summer to fall.

CLEMATIS Linnaeus 1753 **Clematis, Virgin's Bower, Old Man's Beard, Traveler's Joy, *vitalba*** *Ranunculaceae* New Latin, from Latin for periwinkle, from Greek *klematis*, a name for a climbing plant, brushwood, long, lithe branches, clematis, from *klemat, klema* twig; akin to Greek *klan* to break, similar to Greek *klados* sprout, twig, branch. Opposite-leaved slightly woody vines or erect perennial herbs having elongate plumose styles. European species are known as TRAVELER'S JOY

Seeds may be hydrophilic, with dry storage increasing dormancy. Germination characteristics vary between species. Code B, D, or maybe protracted A*. Seedlings may be slow growing. (Cullina 2000)

Clematis virginiana Linnaeus VIRGIN'S BOWER, aka Devil's Darning Needles, Old Man's Beard, fac
Habitat: Mesic savanna, upland swamp, moist wooded roadsides. Thickets and woodland edges common in low ground, but occasional in upland habitats. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 5.0-6.8.
Culture: "Cold moist treatment or fall sow. Removing seed coat may help. Very light cover. Good germination." (Dunham 1993) 30 days cold moist stratification (pm 09). Debearding helps, cold moist stratify (60-180) or fall plant. Light / GA3, cuttings or division, possibly temperature sensitive. Growth rate slow. Seedling vigor low. Vegetative spread rate slow.
Description: Sub-woody vine climbing to 15". Clusters of small fuzzy-looking, four-petaled white flowers, follower by attractive plumed seeds. 14" minimum root depth.

"This is our only species and is rather frequent on brushy stream banks , the edge of woods and in ravines. Kent Creek at Fannan's Crossing west of Rockford." (Fell 1955)
Comments: Considered invasive in parts of the northeast USA (and Whiteside County). Blooms 7-9. C3. Seed matures mid summer to fall. Attractive dried seed heads, landscaping, calcareous. The plants are somewhat slow to mature, but forms large clumps in several years. Awesome on a fencerow. Once established, it will slowly self-sow to the point of being a pest. Apparently it drives our township road commissioner absolutely crazy. He doesn't understand mowing our road actually increases his 'weeds' (the flowers). 192,000 to 329,224 seeds per pound.

Clematis virginiana has strongly toothed leaflets, while the similar escaped *C. tenuiflora / paniculata* has rounded, mostly untoothed leaves.

DELPHINIUM Linnaeus 1753 **Larkspur** *Ranunculaceae* New Latin, from Greek *delphinion* larkspur, diminutive of *delphin-*, *delphis* a dolphin, from the shape of the nectary. Mostly perennial erect branching herbs that are widely distributed in temperate parts of the northern hemisphere, have palmately divided leaves and irregular flowers in showy spikes, and include several containing extremely poisonous substances.

Seeds of native species are hydrophilic and mature early to late summer. Dry one week and sow immediately in a coldframe for germination the following spring. Code B*. (Cullina 2000)

Delphinium ajacus Linnaeus ROCKET LARKSPUR, aka Doubtful Knight's-spur. Now placed in *Consolida* Gray.
Habitat: Low to moderate water requirement. Moderately coarse to moderately fine textured soils. Neutral soils, acid and base tolerant.
Culture: Pure stand plant 10 lb per acre (Granite).
Description: Introduced annual, 12-36", with numerous spurred, multicolored white, pink, or blue, flowers from spring to summer, adaptable species. 150,000 seeds per pound.

Delphinium carolinianum 60 days cold moist stratification (pm 09).

Delphinium exaltatum 60 days cold moist stratification (pm 09).

Delphinium tricorne Michaux DWARF LARKSPUR (three pointed, tri, prefix, from *tres*, three, and *cornis*, adjective *cornu*, horn, antler, and *is*, adjectival suffix)
Habitat: Mesic savanna, Jones' Timber west of LaFayette, and a few plants Rock Island R.R. west of Sheffield.
Cultivation 60 days cold moist stratification (pm 09). Formerly thought of as double dormant, sow fresh seed in permanent location, cool soils, cuttings. This species is 3-4 years to flower from seed.
Description: 0.75-1.5', blue flowers. Blooms 4,5. C3. 651,424 seeds per pound.

Delphinium virescens Nuttall PRAIRIE LARKSPUR, aka Carolina Larkspur (turning green, *virescens*, from Latin *viresco*, to grow green.)
Habitat: Sand prairies.
Culture: 60 days cold moist stratification (pm 09). No pre-treatment needed, sowing outdoors in the spring is the

easiest method, or seeds germinate after about 60 days of cold, moist stratification. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. (Heon etal. 1999) Moist cold stratify division.
Description/comments: 1.5-4.0' Blue to white flowers. Blooms 6,7. C3. Native Hancock County, Illinois, Muscatine Iowa, and west of our area. 358,400 to 960,000 seeds per pound.

HEPATICA Hill. *Ranunculaceae* New Latin, from Medieval Latin, liverwort, from Latin *hepatica*, feminine of *hepaticus* of the liver; Greek *hepar,* the liver for the shape and color of the leaves. Perennial herbs of the north temperate zone that flower in the early spring and have lobed basal partly evergreen leaves and delicate white, pink, blue, or purplish flowers. Hoot, Reznicek, and Palmer (1994) suggest *Hepatica* should be included in *Anemone*.

Seeds are hydrophilic and ripen in late spring, approximately 4 weeks after flowering. Seeds are green when ripe, collect when the seeds are easily removed from the stem. Plant immediately, slow growing, leave flat undisturbed until second growing season. Code D*. Division of mature plants after flowering. (Cullina 2000)

Hepatica acutiloba Augustine de Candolle LIVERLEAF, Hepatica, Sharp-lobed hepatica, Sharp-lobed Liverleaf
Habitat: Mesic woods, calcareous woodlands.
Description: Recalcitrant seed, which cannot be dried or stored. Seed and seed count not available. "This is our common hepatica and is found over the county in moist woods and ravines except in Sugar River sand area. Extra notches on the leaves are not uncommon and blunting of the apex in plants in Kishwaukee River gorge suggests hydridization with the next (H. americana)." (Fell 1955)

Hepatica americana (Augustine de Candolle) Ker-Gawler LIVERLEAF, aka Round-lobed Hepatica, Round-lobed Liverleaf
Habitat: Dry woods, acidic woodlands.
Description: Recalcitrant seed, which cannot be dried or stored. Seed and seed count not available. "We have found this only in Kishwaukee River gorge below Camp Rotary. Here it is abundant over a small area where it grows with the above, the two being about equal in number of plants. There are many intergrades in leaf shape which Dr. Steyermark has called hybrids." (Fell 1955)

HYDRASTIS Linnaeus 1759 **Goldenseal** *Ranunculaceae* New Latin, probably irregular from *hydr-*. A monotypic genus, endemic to eastern North America, an herb having palmately lobed leaves and small greenish apetalous flowers. Sometimes placed in its own family, *Hydrastidaceae* Martinov 1820.

Hydrastis canadensis Linnaeus *CT, GA, MD, MA, MI, MN, NJ, NC, PA, TN, VT GOLDENSEAL, aka Orange Root, Yellow-Puccoon, *Fard Inolien, Hydrastis du Canada, Racirie Jaunisse, Sceau D'or, Kanadische Orangewurz, Hidrastis, Raíz De Oro*
Habitat: Mesic woods. Shade tolerant, approximately 47 to 80% shade. Grows well with pH of 5.5-6.5, but is known to tolerate 4.8-7.8.
Culture: Seeds are hydrophilic and ripen in late summer. Remove seeds from pulp, wash and quickly plant in metal flats outdoors. Do not allow seeds to dry. There will be some germination the first spring, but most the second spring. Code B and C*, G. (Cullina 2000, Davis, 1999) Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. Best planted outdoors in the fall. (pm 09)
Description: general form Thick knotted yellow rootstock and large rounded leaves with usually 5 palmate lobes roots yellow rhizome key features: Fruit is a bright red berry with black seeds.
Comments: Blooms 4-5. Formerly used in pharmacy as a bitter tonic. Squirrels and chipmunks relish the bright red fruit.

ISOPYRUM Isopyrum *Ranunculaceae* Very similar to *Anemonella*

Isopyrum	*Anemonella*
fruit a follicle	fruit an achene
petaloid sepals 5	petaloid sepals 5-10, usually at least some flowers w/ 6 or more

Isopyrum biternatum (Rafinesque) Torrey & Gray ISOPYRUM, aka False Rue Anemone
60 days cold moist stratification (pm 09). 176,000 seeds per pound . "A common woodland plant that blooms early. It often persists for years in places that were formerly wooded, as on roadsides and railroads." (Fell 1955)

RANUNCULUS Linnaeus 1753 **Buttercup, Crowfoot, Spearwort** *Ranunculaceae Ranunculus* little frog, perhaps tadpole, from Latin for *rana* frog, and the diminutive *-unculus*, little, for the wetland habitat of many species where frogs live, i.e., marshes, ponds. Annual and perennial herbs.

Ranunculus fascicularis Muhlenberg ex Bigelow EARLY BUTTERCUP, aka Thick-root Buttercup
Residual soils over sandstone or dolomite, occasional in aeolian sand prairies of Green River.
60 days cold moist stratification (pm 09). "Our common early buttercup. Open woods, pastures, etc." (Fell 1955)

Ranunculus hispidus Michaux BRISTLY BUTTERCUP, aka Hairy Buttercup, Hispid Buttercup
60 days cold moist stratification (pm 09). "Common in moist places in woods and on roadsides." (Fell 1955)

Ranunculus pensylvanicus Linnaeus f. BRISTLY BUTTERCUP, aka Bristly Crowfoot
Habitat: Seasonally inundated, muddy ditches, wet meadows. "One of the less common buttercups. It grows in ditches, marshes and other wet places, blooms late, and fruits abundantly." (Fell 1955)
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify 60 days or fall plant.
Description: Yellow flowers, 1.5-2.5', blooms 7-9, ethnobotanical uses wetland restoration.

Ranunculus rhomboideus Goldie * IL PRAIRIE BUTTERCUP
Habitat: Hill prairies, dolomitic gravel prairies.
Culture: "Upon ripening in mid to late spring, sow seed immediately for germination the same season. Seed can be held in frig in plastic bag for few days. Light cover. Excellent germination." (Dunham, 1993) 60 days cold moist stratification. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. Best planted outdoors in the fall. (pm 09) Fresh seed, division.
Description: Yellow flowers, blooms 4,5 calcareous, short-lived. 448,000 seeds per pound. "Resembles *R. fascicularis* and comes into flower nearly as soon. It is found on dry prairies, gravel hills, and limestone fields throughout the county. The gravel hills east of Ill. Rt. No. 173 and south of Roscoe, a prairie hillside south of Rock Cut, high prairies near Wempleton in Burritt Township, and in Owen Township 5 miles north of Rockford." (Fell 1955)

THALICTRUM Linnaeus 1753 **Meadow Rue** *Ranunculaceae* from *thaliktron*, a name used to describe a plant with divided leaves, a name given to the genus by Dioscorides, the Greek physician and pharmacologist who wrote the *Materia Medica*, which remained a leading pharmacological text for 16 centuries. Excellent foliage effect similar to columbine or maidenhair fern.

Seeds ripen in early to late summer, harvest when the seeds break away easily. A papery green husk makes it difficult to determine when the seeds are ripe. Sow seeds immediately outdoors, as seeds loose viability moderately fast in dry storage. Code B (*?) (Cullina 2000)

Several species have unisexual flowers. Some people mistake the drying male flowers as a sign that seed is ripe and shattering, and harvest immature seed.

Thalictrum dasycarpum Fisch. and Avé-Lall. PURPLE MEADOW RUE
Habitat: Calcareous meadows, stream banks sedge meadows, wet to mesic prairies, mesic woodland, moist wooded ravines.
Culture: "Cold moist treatment or fall sow. Prefers cooler soils, sow early spring or late fall. "(Dunham 1993). 60 days cold moist stratification. Seeds germinate most successfully in cool soil. (pm 09) "60 days moist stratification required for germination. Field sow fall." (pn nd) Cold moist stratify (60) or fall plant, cool soils, division.
Description: Mostly dioecious white flowers pollinated by wind, Diptera and bees, leaflets firm, pubescent, but eglandular beneath. 4.0-5.0', blooms 5,6, ethnobotanical uses, landscaping, calcareous. 176,000 to 348,928 seeds per pound. Fruits are achenes. "Low prairies, damp thickets and other moist places. Less common than *T. hypoglaucum*." (Fell 1955)

Thalictrum dioicum Linnaeus EARLY MEADOW-RUE
"Not uncommon in woods and ravines." (Fell 1955) 60 days cold moist stratification (pm 09). 116,800 seeds per pound.

Thalictrum pubescens Pursh *IN KING OF THE MEADOW, aka Tall Meadowrue, Late Meadow-Rue, Meadow-Weed, Muskrat-Weed, *Pigamon* (pubescent)
Habitat: Full sun to full shade, rich woods, thickets, swamps, stream banks and wet meadows.
Culture: 60 days cold moist stratification (pm 09).
Comments: Blooms 6-8. Often incorrectly listed as *T. polygamum* Sprengel. 192,000 seeds per pound.

RHAMNACEAE A. L. de Jussieu 1789 Buckthorn family

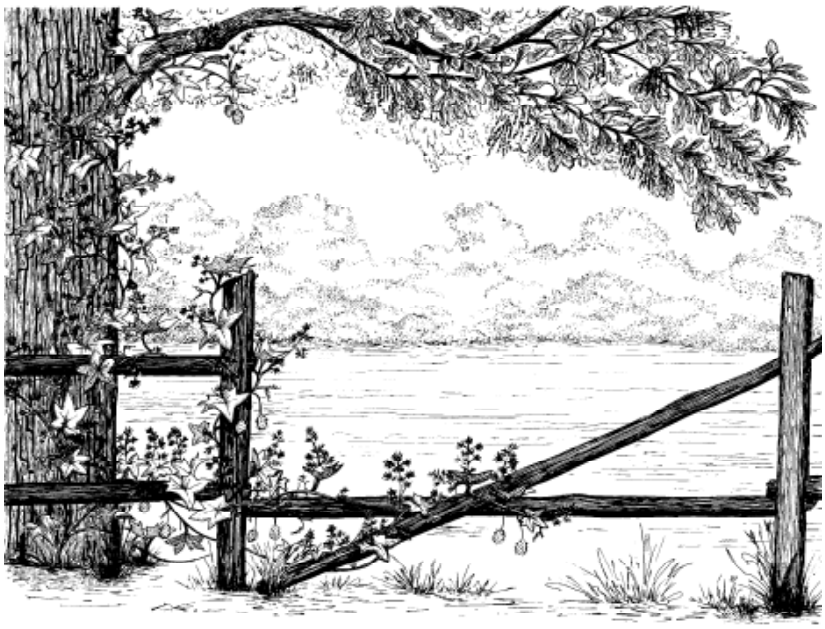
CEANOTHUS Linnaeus 1753 **New Jersey Tea, Redroot** *Rhamnaceae Ceanothus* From the Greek κεάνωθος, *keanothus*, a name for a spiny shrub or a kind of thistle, the name for the corn thistle, *Carduus arvensis*. A genus of about 55 species of deciduous, evergreen, and semi-evergreen shrubs, mostly in California.

In spite of some cheddarhead's nonsense, these are not legumes!!!!!!! *Ceanothus* has a symbiotic relationship with nitrogen-fixing actinorhizal *Frankia.* Inocula not available. Seeds of *C. velutinus* are capable germination after

remaining dormant in the soil for several hundred years. (Conard et at. 1985)

Ceanothus americanus Linnaeus NEW JERSEY TEA, aka Jersey Tea, Jersey Tea Ceanothus, Mountain-Sweet, Mountain-Tea Bohea, Redroot, Sprangles, Walpole Tea, Wild Pepper, Wild Snowball
Habitat: Dry open woods, roadsides, and gravelly shores, prairies and open savannas, mesic, dry, and sand prairies; mesic and dry savannas; prairies, rocky wooded bluffs. Hardy to zone 4, possibly 3.
Culture: "In fall scarify seed then sow, or scarify seed then moist cold treat. Hot water treatment then moist cold treatment recommended by some. Light to medium cover. Unreliable germination." (mfd 1993). Hot water treatment, or seeds need scarification. 70 days cold moist stratification. (pm 09) Seeds need scarification. Hot water treatment. Bring water to boil, add seed, boil for 1½ minutes. Then cold moist stratify (70). (Heon et al. 1999) "Somewhat difficult to transplant. Scarification followed by hot water treatment." (pn nd) GA3 gives best results in greenhouse (gni). Hull, float seed, boil seed, fall plant or moist cold stratify (90). Temperature sensitive. Cuttings. Use mycorrhizal inoculated potting soil.
Description: Shrub (sub-shrub), 3-4', compact rounded, prolific white flowers in June to July, flowers perfect; flat clusters of 3-parted seed pods, fruit is a 3-lobed, dry drupe, 1/5" wide, splitting into 3 nutlets.
Comments Blooms 6,7,8. In northern Illinois, collect seeds in August - September. Collect seeds in se Wisconsin in September - October (Heon et al. 1999). Cut flowers, attractive dried seed heads, ethnobotanical uses landscaping. Non-leguminous nitrogen fixing shrub. 104,176 to 158,769 seeds per pound. Contrary to some wingnut nurseries, *Ceanothus* is not a legume.
"Common in woods, sandy places, roadsides and railroads, flowering about July 1st." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera, and Hemipteras. Occasionally heavily browsed by wildlife, including deer and rabbit. Attracts butterflies, many insects, small mammals, upland game birds, songbirds, intermediate wildlife value. This plant is the larval host for the Spring Azure and the Summer Azure butterflies. Flowers are a nectar source for the Coral Hairstreak, *Satyrium titus*, Acadian Hairstreak, *Satyrium acadica*, Edward's Hairstreak, *Satyrium edwardsii,* Banded Hairstreak*, Satyrium calanus,* Hickory Hairstreak, *Satyrium caryaevorum,* Striped Hairstreak*, Satyrium liparops.*

Ceanothus herbaceus Rafinesque *IL-IN RED ROOT, aka Inland New Jersey Tea, New Jersey Tea, Prairie Redroot, Smaller Red-Root (*herbaceus* herbaceous, herb-like, not woody; with a succulent stem; grassy green.)
Habitat: Dry to dry-mesic prairie, jack pine savanna, and pine barrens. Sandy soils.
Culture: Hot water treatment, or seeds need scarification. 60 days cold moist stratification. (pm 09) Seeds need scarification. Hot water treatment. Bring water to boil, add seed, boil for 1 ½ minutes. Then cold moist stratify. (Heon et al. 1999) Hull, float seed, boil seed-fall plant or moist cold stratify (90). Stem cuttings. Use mycorrhizal inoculated potting soil.
Description: Small shrub with white flowers, 1.5-2.5'. Blooms 5,6. In northern Illinois, collect seeds in July. Collect seeds in se Wisconsin in July - August (Heon et al. 1999). Cut flowers, attractive dried seed heads, ethnobotanical uses landscaping. 133,408 to 160,000 (pm2002) seeds per pound. In spite of the specific epithet, a more woody species than *C. americanus,* flowers about a month earlier than *C. americanus*. Zone 3.
"A high prairie shrub that is rare with us. On a gravel hill-top south of Broadway on the C. & N.W. Ry. r.o.w. is a single plant that has persisted for years; on North Rockton avenue road near Harrison-Rockton road (Ill. Rt. No. 75) in a high prairie area are several well developed plants. Not found in Sugar River sand area. Its flowering time is late May." (Fell 1955)
Associates: Attracts butterflies. Rabbits eat small plants to the ground in winter.



ROSACEAE A. L. de Jussieu 1789 **Rose Family** ***Rosa*** From the classic Latin name, whose meaning has been lost, *rosa, rosae*, a name for various roses; through intermediate Greek and Italian dialects from Greek ῥόδον, *rhodon,* ῥοδέα, *rodea,* probably of Iranian origin. About 85-95 genera and 2000-3000 species of trees, shrubs and herbs. Cosmopolitan, but mainly boreal and temperate.

AMELANCHIER Medikus 1789 **Serviceberry, Sarvis, Shadbush, Juneberry, "May Cherry", "Currant"** New Latin, from an old French (*Provençal*) common name snowy-*Mespilus*, for *A. ovalis, amélanchier* shadbush, shadberry; or of Celtic origin, akin to Gaulish *avallo* apple, Old Irish *ubull*. Alternately, from the Savoy name *amelancier,* the medlar tree. A genus of about 20-40 species of shrubs and trees of the north temperate zone, with showy usually racemose white flowers followed by somewhat sweet, edible pomes resembling small apples. Fruits are fine fare for our feathered friends. *Amelanchier* is the larval host for *Satyrium liparops,* the Striped Hairstreak butterfly.

Amelanchier arborea (F. Michx.) Fernald (or (Michaux f.) Fernald) JUNEBERRY, aka Service Berry, Shadblow Serviceberry, Shadbush (*arboreus -a -um* tree-like)
Habitat: Moist woods and rocky uplands, steep slopes, pine barrens, mesic woods, wooded hillsides, stream banks, swamps, wet woods, dry rocky woods, bluffs, thickets, and slopes. Optimum pH 5.4. "About as common as *A. laevis*. Usually on streambanks as Kishwaukee River on Perryville road in Mulford woods, the Kinnikinnick Creeks, etc." (Fell 1955)
Culture: Best planted outdoors in the fall (pm 09).
Description: Tall multi-stem shrub, 6-25' tolerates medium shade, early spring blooms, edible black fruit, fall color yellow and gold, to 25 ', suckers. Some nurseries separate *A. arborea,* DOWNY SERVICE BERRY from *A. canadensis,* SHADBLOW, described as 6-7', coarser branches, showy white flowers, 1/2"blue fruit, glossy deep green foliage, yellow-orange fall color (RRN, 1997).
Comments: Blooms April to mid-May, 75,008 seeds per pound.
Associates: Upland game birds eat fruit and buds. Songbirds eat fruit; aquatic furbearers eat fruit, bark and twigs. Terrestrial furbearers, small mammals, and deer eat fruit. Rabbits may girdle shoots in winter. Used by songbirds, squirrels, chipmunks, and black bear.

Amelanchier humilis Wiegand LOW SHADBUSH (*humilis is -e* low growing, of low growth, dwarf, from Latin for on or near the ground, low, shallow; humble.)
Habitat: Rocky, sandy soil.
Culture: Transplants easily, B&B.
Description: Shrub to 6', colonial shrub, good form; flowers perfect, showy, insect pollinated , probably similar to *A. arborea*; fruits are fleshy pomes, pink, turning purple black, 1/4" diameter; attracts songbirds, small mammals, game mammals, high food value in early summer; several rusts, fireblight and minor insect problems

Amelanchier laevis (Michaux f.) Fernald SMOOTH SERVICEBERRY, Allegheny Serviceberry, Allegheny Shadblow, Juneberry, Service Berry (*laevis* LIE-vis; smooth, as in not being rough), or beardless and delicate, soft, for the leaves)
Habitat: Dry to moist thickets, borders of woods, margins of swamps, and clearings. Lake Michigan high dunes, bogs;

wooded slopes, borders of dry to moist woods.
Culture: Transplants easily, B&B.
Description: Shrub to 6', good form. One of first small understory trees to bloom, white flowers before leaves, flowers perfect, showy, insect pollinated, probably similar to *A. arborea*; fruits ripen from bright red then purplish. Fruits are fleshy pomes, pink, turning black, 1/4" diameter. Trees have "weeping" fine branches; Leaves are bronze colored as they unfold, orange-red fall color.

"Usually on streambanks as Hall, Kent, and the and the Kinnikinnick Creeks, Kishwaukee River at Mulford woods and the woods east of Roscoe. Commonly taller than *A. arborea*. There are much larger trees in the sandstone ravines west of Oregon in Ogle County than any we have seen in Winnebago, Stephenson, or Jo Daviess counties." (Fell 1955)
Associates: Attracts songbirds, small mammals, and game mammals. High food value in early summer. Subject to several rusts, fireblight and minor insect problems.

Amelanchier stolonifera Running Serviceberry
60 days cold moist stratification, or best planted outdoors in the fall. (pm 09)

ARONIA Medicus 1789 **Chokeberry** From the Greek *aria*, the name for *Sorbus aria*, the Whitebeam tree, or from Greek *arōnia,* the medlar tree, or modified from *Aria*, beam-tree of Europe. A small genus (up to 65 species of east Asia and eastern North America south into Central America) of attractive suckering shrubs with white or pink flowers in terminal compound cymes in April to May, followed by black or red berry-like pomes (miniature apples). Usually sets high percent sound seed, up to five seeds per fruit. Remove seeds from fruit (macerate) before planting. C3. Rabbits will damage plants in winter.

Taxonomy of chokeberries is almost hopeless, even if you get past the genus name. Some job-writers, are, as of July 2006, calling Midwestern chokeberries *Photinia* in job specifications. *Photinia* may be the genus name of choice in the future, but I'm sure someone probably said the same thing about *Pyrus*, *Aronia*, and *Sorbus*. *Aronia* has been considered part of *Sorbus* and *Pyrus* in the past. Robertson et al (1991) place *Aronia* in *Photinia.* Kalkman in Kubitzki (2004) notes they should be combined, but points out that *Aronia* is the older name and is correct for the combined genus. (Weakley 2007)

Aronia is distinguished from other shrubs by several small black to purplish glands or trichomes on the upper surface of the midrib, usually near the base of the leaf. Some *Malus* may have similar but reddish trichomes. (Swink & Wilhelm 1944, Weakley 2007)

Aronia arbutifolia (Linnaeus) Persoon [new nomenclature *Photinia pyrifolia* (Lam.) Robertson & Phipps] RED CHOKE BERRY (*arbutifolius -a -m* arbutus-leaved, with leaves like the Strawberry tree, *Arbutus*, from Latin *arbutus* and *folium*.)
Habitat: Tolerant of medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 5.5-7.5. distribution: Native to the eastern and southern US.
Culture: Cold moist stratification is required. Macerated seed cold moist stratified at 40ºF in peat moss gave 8% germination (Davis and Kujawski 2001).

July softwood cuttings root readily with 4000 ppm. IBA solution and mist. Winter collected fruits (January) may be planted immediately, fruit has been naturally stratified. Root cuttings in December-January work well. Softwood cuttings of "Brilliantissima" in June 4000 ppm IBA and mist in peat/perlite mix root 80%. Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate. Spreads slowly from seed.
Description: form: Fine textures branches and foliage, to 10' leaves red fall color flowers clusters of white flowers, 5-merous fruits red fruit persisting through winter. 20" minimum root depth.
Comments: Blooms mid spring. Minor food value to large mammals. Low food value to upland birds. 256,000 (usda) seeds per pound.

Aronia melanocarpa (Michaux) Elliott *IA BLACK CHOKEBERRY (with black fruits, from *melas*, dark, and *carpos*, fruit.)
Habitat: Dry prairies, dry savanna, dry sandstone cliffs and ledges, swamps and low grounds, edges of bogs, peaty flatwoods, moist sandy woods, edges of bogs,; moist woods. "Found in boggy places in the sand area in the north part of the county and also in a wet place in the sand area north of Rock Cut." (Fell 1955)
Culture: Macerate, fall plant or cold moist stratify (90), cuttings. Requires prechilling at 2 -5º C. for > 90 days. Germination tests use warm moist stratification seed for 30 days at 20/30ºC alternating temperatures or constant 20º C. Nursery practice is to mash whole fruits and stratify the mass. Recommended planting depth 1.8 mm. Germination epigeal. (Young &Young 1992) Maceration recommended with fall planting or 60 - 90 days cold moist stratification (Dirr & Heusser 1987). Cold moist stratify 90 days @ 41º F. (Hartman & Kester 1983). A Russian source says softwood cuttings in May-June in well-ventilated frames root well. Hardwood cuttings with 2-year-old wood attached said to root well. Transplants easily.

Description: Upright shrub 1.5-4.0' (12' in some parts of its range) suckering profusely. Clusters of white flowers in a dichasium (a cymose inflorescence that produces two main axes), perfect, 5-merous. ethnobotanical uses landscaping. Fruits are fleshy, purplish-black pomes, 3/8" diameter, the early fall fruit color is interesting, red fall foliage color. key features " Leaves glaborous (sic) beneath; leaf teeth with terminal gland; fruit black; compound clusters of small flowers." (ilpin)
Comments: Blooms 4-6. C3. Black chokeberry ripens from August to November and yields a good crop every second year. 197,006 to 276,000 seeds per pound. This is not a wetland plant in our experience NW Illinois, but virtually all of this plant's former wetland habitat in NW Illinois is now corn and soybeans.
Associates: Pollinated by insects, especially bees. Attracts songbirds, upland game birds, and small mammals. Upland game birds (esp., grouse) feed on fruit and buds, songbirds eat fruit. Foxes, rabbits, and squirrels eat fruit and foliage. Small mammals eat fruit, Deer browse twigs, foliage, and fruit. (Anon. 1981) Rabbits damage stems in winter. High wildlife value in early fall. Several rusts, fire blight, minor insect pests, rarely serious

ARUNCUS Linnaeus 1758 **Goat's Beard, Bride's Feather** New Latin, from Latin, beard of a goat, from (assumed) Doric Greek *aryngos*; akin to Attic Greek *eryngos*, both from the Indo-European root **ue(s)r*, spring; alternately from Greek, originally a name used by Pliny the Elder, early Roman naturalist and author, but meaning is said to be lost. Small genus of herbs (1-2 species) found in North America, Europe, Korea and Japan, and having compound leaves and a showy branched cluster of white flowers. Herbaceous perennial often called spiraea, similar to *Astilbe biternata.*

Aruncus dioicus (Walter) Fernald var**. pubescens** (Rydberg) Fernald GOATS BEARD, aka Midwest Goat's-Beard (*dioicus* two houses, dioecious, indicating that the male and female flowers are found on different plants *pubescens*, becoming hairy, from Latin *pubescens*, *pubescent*, from *pubesco*, to reach puberty, become pubescent.)
Habitat: Mesic woodland, with moisture-retaining soil.
Culture: Fall plant or cold moist stratify, surface sow, seeds require light / GA3, tiny seedlings. Moderately difficult from seed. Code B, Code H. (Cullina 2000)
Description: Creamy white flowers, with male and female flowers on separate plants. 3.0-4.0' Attractive compound leaves similar to *Astilbe*.
Comments: Blooms 5-7. Seeds mature early fall. Landscaping. Dioecious, the yellow anthers of the male flower make it a bit showier, but the green-gold developing seed heads provide fall interest. 1,314,000 seeds per pound.
Associates: Excellent nectar plants.

CRATAEGUS Linnaeus 1753 **Hawthorn, Haw, Redhaw, Thornapple** From the Greek *kratos* strength for the hard wood, also in reference to *crataeg*-, Greek for thorn, for the many thorny species. Deciduous trees. About 25 to 50+ species grow in upper Great Lakes region. A genus of 100-500 species of shrubs and small trees of north temperate and Central America, primarily in eastern North America. *Crataegus* is the larval host for the Striped Hairstreak butterfly. Possums and squirrels eat the fruits. God must love *Crataegus*, for he made so many of them.

Crataegus crus-galli Linnaeus COCKSPUR HAWTHORNE, aka Cock-Spur Thorn (a cock's spur, for the long thorns.)
Habitat: Pastures, open woods, thickets, wooded slopes
Culture: Further germination pretreatments not sure? (Prairie Moon)?
Description: Shrub or tree to 20', rust resistant with deep green lustrous leaves, persistent red fruit, large thorns to keep out the riffraff. Zone 3. Waterfowl (esp. wood ducks) and songbirds eat fruit. Upland game birds eat fruit and buds. Aquatic furbearers eat fruit and wood. Small mammals eat the fruit. Deer eat foliage, twigs, and fruit. "Extensively planted in Camp Grant but we have not found it native in the county." (Fell 1955)

Crataegus mollis (Torrey & A. Gray) Scheele DOWNY HAWTHORNE **(***mollis -is -e* soft, soft hairy, tender, pliant, supple, from Latin *mollis*, swaying, swinging; pliant, tender, easily moved; soft, graceful, delicate)
Large wide growing trees, showy flowers, nonpersistent red fruit, clay soils, susceptable to rust, leaves often gone by August, dominant in degraded river bottoms, zone 3.
"By far our most common species and the earliest to bloom. Definitely a tree in size and shape, often growing in the open." (Fell 1955)

Crataegus phaenopyrum (Linnaeus f.) Medikus WASHINGTON'S HAWTHORNE, aka Washington's-thorn (*phaenopyrum* with appearance of a pear)
Habitat: Needs well drained soil. Native to the eastern United States, but escapes from cultivation may be expanding its range.
Description: Upright tree 25-30', good flower show before leaves appear, persistant orange to glossy red fruit, fall color yellow to orange to orange-purple, good rust resistance, numerous short thorns, zone 3. Provides good cover for many wildlife species. Used by fox sparrow, cedar waxwing.

FILIPENDULA P. Miller 1754 **Queen-of the-Prairie, Queen** From Latin *filum*, a thread, and *pendulus*, hanging, referring to the threadlike roots connecting the tubers of some species. A genus of about 15 species of perennial herbs, north temperate in eastern and northwestern North America, Europe.

Filipendula rubra (Hill) B.L. Robinson *IL ,IA, MD, MI, NJ, NC QUEEN OF THE PRAIRIE (from Latin *ruber, rubr-,* red, ruddy, for the flowers.)
Habitat: Sandy or peaty fens. Wet sand, calcareous distribution: Considered an introduction in Wisconsin? (Freckmann)
Culture: "Cold moist treat, or fall sow. Very light to no cover. Tiny seeds. Generally very poor germ." (Dunham 1993) Cullina (2000) cites a multicycle dormancy mechanism and recommends planting fresh seed immediately for germination the following spring. Code D. Division of mature plants. Single node stem cuttings and rhizome cuttings. Cold moist stratify (90) or fall plant. Light.
Description: general form Erect, perennial, 3'-7' tall, smooth forb culms 3.0-6.0' leaves once pinnately-divided, side leaflets 3-5 lobed; end leaflet kidney-shaped in outline, up to 8" wide, deeply cut into 5-9 parts flowers showy, fragrant pink, astilbe-like, 5-merous, 1/8"-1/3" wide, circle of 5-15 pistils; inflorescence a 4"-8" wide, branched, tall, dense cluster (panicle) of stalked flowers; seed dry, smooth, straight, erect, oblong seed key features Bruised foliage has cucumber-like fragrance. Fruit smooth, straight. Leaves once pinnately-divided, side leaflets 3-5 lobed; end leaflet kidney-shaped.
Comments: Blooms 6,7. Seeds mature late summer. May self-sow or spread from rhizomes in rich soils. Cut flowers, landscaping, aggressively rhizomatous in good, rich habitats. 608,000 seeds per pound.

FRAGARIA Linnaeus **Strawberry** From the Latin name *fraga*, *fragum*, fragrant, referring to the scent of the fragrant fruit, or *fraga, fragum*, strawberry and New Latin *-ia.* A genus of about 10 species of perennial herbs of temperate Eurasia, North America, and South America. Fleshy fruit with tiny achenes.

Fragaria virginiana Duchesne (or P. Miller) WILD STRAWBERRY, aka Thick-leaved Strawberry, Virginia Strawberry (*virginiana* of Virginia)
Habitat: Grows in a variety of open habitats, wet to mesic prairies, woods. Grasslands, roadsides, pastures.
Culture: Easy by division or separation of runners. *Seed is nonexistant in the trade.* Wild Strawberry can be established in restorations by throwing ripe fruits around. Once established, birds will slowly spread this species around a site, sometimes moving it 500 to 1000 feet at a time.
Description: general form Erect, perennial, 4"-6" tall forb culms sprawling vine, rapidly spreading leaves basal, 3-parted, toothed; end tooth usually half as wide and shorter than the side teeth; leaflets stalked flowers white, 5-merous
Comments: Blooms 4-6. Forms a good ground cover, most excellent edible fruit. Bet ya can't eat just one. Seed count not available. "Our common wild strawberry. We do not know of the cultivated strawberry escaping in northern Illinois." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera. Attracts small mammals, songbirds, game birds. The seed is dispersed by birds or small mammals.

GEUM Linnaeus 1753 **Avens** New Latin, from Latin *gaeum, geum* herb bennet. Perennial herbs with pinnate or lyrate leaves and flowers with long plumose persistent styles.

Seeds germinate easily after cold moist stratification. Code B. (Cullina 2000)

Seeds of *Geum* germinate without pretreatment, but are sensitive to drying during testing (AOSA 1970). Seeds of *Geum aleppicum strictum* require light, and should be incubated at 60 - 80º. 30 days for total germ. (Wade says cold moist stratification for *G. aleppicum*). *Geum rivale* poor germinator. Some germination with incubation at 65-80º. Cold moist stratification did not improve germination. (Lincoln 1983) (Young & Young)

Geum seeds germinate in 3-4 weeks at 68-86º F. Division in spring or fall.

Geum aleppicum Jacquin var. **strictum** (Aiton) Fernald YELLOW AVENS (*aleppicus -a -um* of Aleppo (Beroea, Syria), a city of north Syria, on the caravan route between the Euphrates and the Mediterranean. Beroea was made a Macedonian city by Seleucus Nicator between 301 and 281 B.C, and sacked by Chosroes in A.D. 540.; *strictus -a -um* strict, upright, erect, from Latin *strictus*, drawn tight, bound up)
Habitat: Fens, wet meadows, upland swamp. Bogs and boggy meadows.
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant, light.
Description: general form Erect native perennnial culms 2.0-3.5', stems stout and very hairy leaves pinnately-divided, 3-parted, or undivided; toothed, end and side segments of basal leaves mostly alike flowers yellow, 5-merous, 1/2" wide, spreading petals only slightly longer than the sepals; inflorescence of erect flowers on long stalks, about 200 or more hooked, dry seeds per head key features Stems very hairy. Petals only slightly longer than the sepals. Leaflets are toothed, and the 3 segments are mostly alike.
Comments: Blooms 5-7, calcareous and acidic. 320,000 seeds per pound**.**

Geum triflorum Pursh. *MI PRAIRIE SMOKE, aka Old-man's-whiskers, Prairie Avens (*triflorus -a -um* three-flowered)
Habitat: Dry, sandstone, and limestone prairies, calcareous and dolomitic gravel hill prairies. Dry-moist prairies and open woods, thrives in poor soil. (pph) "Common on high gravel and also on low prairies. It grows in large patches and blooms early so is very conspicuous on the gravel hills that border Rock River and the low prairies in Coon, Kent, and Grove Creek bottoms." (Fell 1955) distribution: Only in the top three tiers of counties in Illinois, more common north.
Culture: Seeds have physiological dormancy (Wick et al. 2008). Fresh seed or cold moist stratify or fall plant; bottom heat helps, light, division in spring before growth begins. Easy by fresh or dry stratified seed or rhizomes.

Cold moist stratification (Wade 1995). "Sow seed upon ripening and over winter flats, or fall sow. If not possible, try cold moist treatment. Light cover. Watch overwatering. Variable germination" (Dunham 1993). 60 days cold moist stratification (pm 09). "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, early spring, fresh seed." (pn nd) 5 months outdoor cold moist stratification or a minimum of 30 days cold moist stratification for Glacier National Park ecotype (Wick et al. 2008). Best results when planted immediately. Keep on drier side to avoid damping off. Sensitive to spring fires. Easily transplanted, adults drought resistant. Plant where grass is not heavy. Seeds need no treatment. (pph). Clump division in spring. To prevent overcrowding, divide clumps after 2 or 3 years of flowering. (tlp) Debearding facilitates handling of the seed but is not necessary to grow plants (Cullina 2000). Does not like grassy competition.

Needs sun and well-drained sandy soil with pH of 6.0 to 7.0. Plants spread rapidly, divide underground stems in late summer. Germination poor. (tlw)

Dry stratification or fresh seed. Seed sown in flats (as opposed to the ground) because seedlings grow slowly the first year. Remove seedlings from flats and transplant when leaves are 2 to 2.5 inches long. Division easier. Separate transplants with light colored root from those with heavy black lateral roots. Including small sections of coarse old root on transplants will increase survival in dry areas. Adding lime helps. (tpg)
Description: culms 0.5-1.0' leaves basal 4"-8" long, pinnately-divided into 7-17 progressively larger leaflets; stem with a few small leaves flowers inconspicuous reddish or pink to purple, 5-merous, 1" long, petals longer than the sepals; inflorescence of several flowers, nodding when young, becoming erect in seed; dry seeds with long, thread-like styles key features Petals longer than the sepals, long, thread-like styles, leaves pinnately divided into 7-1 leaflets.
Comments: Blooms 4-6. Landscaping, rock gardens, ground cover, attractive dried seed heads. 432,000 to 859,848 seeds per pound. Seed is a plumed achene.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Coleoptera. Attracts upland game birds and songbirds.

GILLENIA Moench 1802 [*Porteranthus* (Britton ex Small)] **Indian Physic, Bowman's Root** In honor of Arnold Gillen, or Gill (*Gillenius*) 17th century German botanist. 2 eastern North American species of perennial rhizomatous herbs (subshrubs), having trifoliate leaves and white or pale rose flowers. There is controversy about the fact *Gillenia* is a homonym or a parahomonym of *Gillena*, an older name. The genus name *Gillena*, as a synonym for *Clethra*, was never properly published by Michel Adanson in 1763. *Gillenia* is older then *Porteranthus* and should be used. (*G. aggregata* is a biennial [pots 2000]) x = 9.

Seeds ripen early fall, small lobed capsules that crack when ripe. Easy by cold moist stratification. Code B. (Cullina 2000)

Gillenia stipulata (Muhl.) Trel. *MD [also as *Gillenia stipulata* (Muhlenberg ex Willdenow) Nuttall, or as (Muhl. ex Willd.) Baill.] INDIAN PHYSIC, aka American Ipecac, Midwestern Indian Physic, Western Indian Physic
Habitat: Dry or moist upland woods. Dry to mesic woodlands and forests.
Culture: (Code C Ken Schaal) 60 days cold moist stratification (pm 09).
Description: 133,333 seeds per pound. Endangered, extirpated in Maryland.

MALUS P. Miller **Apple, Crabapple** From the Latin name for apple, *malus, -malus* from *mālus, māli* f. Latin an apple; bad, evil, wrong, from Greek *mêlea*, an apple tree. *Mālus* is apple, *mălus* is evil (from *mălus -a -um* adjective, *mălum i* n. anything bad, evil, mischief). A genus of 30-50 species of trees and shrubs of the north temperate zone. Woods, thickets, fencerows. Upland game birds eat fruit, seeds, and buds. Songbirds eat fruit and seeds. Terrestrial furbearers and small mammals eat fruit and bark. Rabbits damage trees in winter. Deer eat twigs, foliage, fruit. oliage, fruit.

Malus coronaria (Linnaeus) P. Miller SWEET CRABAPPLE, American Crab Apple, Crab Apple, Sweet Crab, Wild Crab Apple (*coronarius -a -um* used in or belonging to garlands, of crowns)
Habitat: Clearings, woodlands and fencerows, bottoms, wooded slopes, thickets, and clearings.
Description: Pure pink flowers followed by green fruit, white and gray winter bark. Very susceptible to leaf scab and rust that can often defoliate trees in late summer. Zone 4

Malus ioënsis (A.W. Wood) Britton IOWA CRAB, aka Iowa Crab Apple, Klehm's Bechtel Crab, Prairie Crab, Prairie Crab Apple, Western Crab Apple
Habitat: Dry and sand prairies, mesic savanna, abandoned pastures, woodland edges, forest and prairie edge. "Our only wild crab. Abundant in woods, fence-rows, etc." (Fell 1955)
Culture: Macerate to remove seed from fruit, cold moist stratify (30-120) or fall plant. The 'apples' may have the flavor, texture and appeal of a pine 2X4. Apples from west of Walnut taste horrible, bad enough microbes won't eat them, while apples from near DePue are quite sweet.
Description: Clear pink flowers followed by sticky green apples, 6-15' (20). Blooms 4,5, shrub with tangled branches, gray bark during winter, usually covered in lichens, said to be aggressive(?). Also susceptible to leaf diseases. Zone 4.

The Bechtel flowering crab, aka Bechtel's Crab, Violet-scented Crabapple (variety 'Plena') is derived from the Iowa Crab and has large, double pink blossoms.

PHYSOCARPUS (Cambess.) Rafinesque 1838 **Ninebark** From Greek *phusa*, *physa* bladder and *karpon, karpos* a fruit, for the inflated, bladder-like fruits. A genus of 3-5 species of deciduous shrubs of North America and northeast Asia.

Physocarpus opulifolius (Linnaeus) Maximowicz COMMON NINEBARK, aka Atlantic Ninebark, Eastern Ninebark, Ninebark. (*opulifolius* opulus-leaved, with leaves like *Viburnum opulifolius,* or with leaves like *opulus,* the guelder-rose, a type of maple)
Habitat: Dry woodlands, flood plains, borders of wetlands, shores, rocky banks, and thickets. Moist, sandy or rocky soil, especially along streambanks and shores, rocky slopes, margins of lakes and pond; rocky slopes and banks, moist swales, gravel bars, limestone cliffs. This plant used to grow in shallow soils developed on bedrock on a roadcut by Meiner's Wetland.
Culture: Ninebark ripens from late August to early October. Viable seed set is typically low. Untreated seed can be fall planted, or cms seed spring planted. (Young & Young 1992). 60 days cold moist stratification (pm 09). Dry storage (180), cold moist stratify or fall plant, soft wood cuttings. Untreated seeds germinate without pretreatment (Dirr & Heusser 1987). Fresh seed germinates best when started at 70º F. germinates 63% . Fresh seed started at 40º F. germinated 27%. Dry stored seed started at 70º F. did not germinate. Dry stored seed started at 40º F. germinates 42%. (Deno 1991) Transplants easily BR or B&B.
Description: Large arching shrub, 3-10', creamy-white spring flowers, flowers perfect. Reddish seed capsules in clusters, colorful, exfoliating winter bark, yellow orange fall color. Blooms 5,6. Ethnobotanical uses, landscaping, calcareous Fruits are follicles, 1/4" long in clusters of 3-5, with hard shiny tan seeds 544,000 to 907,200 seeds per pound. Few diseases or pests.

"Not common in the county. It occurs occasionally in boggy places as in the Searle Tract and more frequently on stream banks, especially Kishwaukee River in its course through this and Boone counties. Also known in Stephenson County. it is used in shrubbery plantings but we do not know of it escaping." (Fell 1955)
Associates: Pollinated by insects, especially Diptera. Attracts insects, attracts upland game birds, small mammals, intermediate wildlife value;

POTENTILLA Linnaeus 1753 **Cinquefoil, Five-fingers, Potentilla** From the Latin diminutive of *potens,* powerful, for the powerful medicinal properties of certain species. A genus of 400-500 species of perennial herbs and shrubs. Seeds are achenes. Seeds of *P. recta, P. norvegica,* and *P. glandulosa* require light for germination. *P. recta* germinates between 60-80º F. (Young & Young)

Yet another hacked up genus, now split into at least 5 genera. Some species are now placed in *Argentina, Drymocallis, Pentaphylloides (Dasiphora),* or *Sibbaldiopsis. Sibbaldiopsis*: for Dr. Robert Sibbald, 17th century professor at Edinburgh and Greek οψις, *opsis*, "like", a seeing, referring to similarity to *Sibbaldia.*

Seeds ripen in summer, turning from green to brown. Easy by cold moist stratification. Code B. Stoloniferous species are easy from offsets. Clump-type species can be divided. (Cullina 2000)

Potentilla anserina Linnaeus *IN, IA. PA [new nomenclature *Argentina anserina* (L.) Rydb.] SILVERWEED, aka Silverweed Cinquefoil (*anserinus* meadow-loving, loved by geese, or belonging to geese, or growing on land grazed by geese from Latin *anser*, a goose, and *-inus*, belonging to or resembling; of or pertaining to geese, goose-grease, goose down, from Greek *anser*, a goose sacred to Juno.)
Habitat: Characteristic of the beaches and pannes of Lake Michigan, sand banks, and gravel bars. Tolerant of coarse, medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement low. Salinity tolerance low. Shade tolerant. pH 7.0-8.0.
Culture: Easily propagated from offsets. With Montana ecotype, seed is physiologically dormant; cool dry stored seed needs no treatment (Winslow 2002). Growth rate rapid. Seedling vigor high. Vegetative spread rate rapid. Spreads rapidly from seed. Seed is not in the trade.
Description: general form Decumbent stoloniferous perennial roots 6" minimum root depth culms 2" to 6" or 8",

stems long, with small leaf clusters and flower stalks arising from the nodes leaves to 12" long, pinnately divided, leaflets sharply toothed, silvery below with long hairs flowers yellow 5-merous, ¾" wide, solitary on thin, leafless stalks, axial or from the mother plant; fruit dry, deeply grooved seeds as thick as wide key features Long, pinnately divided leaves, silvery hairy below.
Comments: Blooms 5-9. Calcareous soils, rock gardens, stoloniferous. 1,200,000 seeds per pound.

Potentilla arguta Pursh *AR, CT, OH PRAIRIE CINQUEFOIL, aka Cinquefoil, Tall Cinquefoil, Tall Potentilla (*argutus -a -um* Latin for sharp, fine pointed, sharply toothed, serrated, from Latin *argutus*, that which becomes acute to the senses: sharp, fiery, shrill, pointed, referring to the sharp teeth on the leaves)
Habitat: Dry rocky or gravelly soil of woods and dry mesic prairies. Mesic, dry, hill, gravel, and sand prairies, dry and sand savannas. "Common on dry prairies especially the gravelly areas in the Rock River valley." (Fell 1955) In the se USA greenstone barrens (Weakley 2007). Tolerant of medium textured soils. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 6.0-8.0.
Culture: "Cold moist treatment, or fall sow. Germinates better in cooler soils; sow very early spring or late fall. Very light to no cover. Very good germinator." (Dunham) Cold moist stratify, cool soils (Wade 1995). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil. (pm 09) "30 days moist stratification required for germination. Field sow fall." (pn nd) "Seedling transplant, spring broadcast. Seeds small, but emergence and growth good. Flowers 2nd year" (Morton Arboretum, Ray S.). Cold moist stratify or fall plant-light-cool soils-division, "Easy from stratified seed #1-4, easy by division, helped by stratification, layering" (pph). Baskin & Baskin (2002) report the seed to have physiological dormancy, and recommend cold moist stratification for 120 days with germination at 18 to 21º C. Dormancy varies from year to year, for good results cold moist stratify. Growth rate moderate. Seedling vigor low. Vegetative spread rate none. Spreads slowly from seed.
Description: general form Erect perennial subshrub, covered with fine brownish hairs roots 10" minimum root depth culms 1.5-3.0', culms unbranched to the inflorescence leaves pinnately divided; basal leaves long-stalked and with 7-11 leaflets; upper leaves with usually only 5 leaflets flowers yellow, 5-merous, 1/2"-3/4" wide, petals slightly longer than the sepals; inflorescence a branched, tight cluster or cyme; fruits are dry seeds key features Plant covered with fine brown hairs, petals slightly longer than sepals, inflorescence a tight cyme, basal leaves with 7-11 leaflets
Comments: Blooms 6-8. Cut & attractive dried seed heads, landscaping. 2,800,000 to 3,680,000 seeds per pound.
Associates: Pollinated by bees.

Potentilla fruticosa Linnaeus *IA, PA [new nomenclature *Pentaphylloides floribunda* (Pursh) A. Löve] SHRUBBY CINQUEFOIL, Bush Cinquefoil, Golden-hardhack, Shrubby Five-fingers, Shrubby Potentilla, Widdy (*fruticosus -a -um* shrubby, bushy, from Latin *fruticosus,* bushy, shrubby, from *fruticosus -a -um*, bushy or full of bushes, from *frutex*, a shrub).
Habitat: Calcareous habitats, boggy fens, dry hill prairies, interdunal ponds close to Lake Michigan (Swink & Wilhelm 1994). Wet open areas, bogs, and dry prairies, likes calcareous soil. Bogs, dunes, and lime shorelines of Lake Michigan; interdunal ponds, fens, gravel prairies, limestone cliffs. Wet to dry open calcareous habitats. pH circum-neutral, 6.8-7.2. distribution: "Known to us in Lake, Jo Daviess and Carroll counties. Reliably reported to grow in this county but we have not found it. It is used to some extent in perennial gardens in Rockford." (Fell 1955)
Culture: 60 days cold moist stratification (pm 09). 1-4, division, cutting taken in late summer and placed in closed cold frame over winter; can use cuttings in early summer; layering (pph); Transplants easily
Potentilla spp. Propagation is usually by cuttings, but seed and division can be used. Cuttings are taken from early summer through fall. Rooting is best under light mist with bottom heat. Rooting hormones are helpful.
Description: Erect shrub, 1'-3' tall, with bright yellow, 5-merous, ¾" wide.
Comments: Blooms 6-9, flowers perfect, foliage gray-green. Zone 2. Fruits are small achenes in a dry hard head. This species has become a common landscape plant, with many cultivars available at any mass-marketer in the Midwest, generally not Illinois ecotype.
Associates: Pollinated by insects, especially Hymenoptera and Diptera. Attracts songbirds and small mammals, but of low wildlife value; of low food and cover value for terrestrial birds. Generally pest free.

Potentilla palustris (Linnaeus) Scop. [new nomenclature *Comarum palustre*] MARSH CINQUEFOIL, aka Marsh Locks (*palustris -tris -tre* marsh-living, of swamps, marshes, or growing in bogs, marsh loving, from Latin *paluster -tris -tre* marshy, boggy)
Habitat: Bogs, swamps, streambanks; in mucky, peaty soils; rare in Illinois.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)
Description: general form Native sprawling, perennial, 8"-24" tall, emergent, semi-aquatic roots from long rhizomes culms stems reddish-brown, coarse, somewhat woody below leaves long stalked, pinnately-divided into 5-7 leaflets,

oblong to elliptical, sharply toothed flowers red to purple, 5-merous, 3/4" wide, petals half as long as the sepals; inflorescence a few-flowered, leafy cluster; fruit is a head of smooth, dry seeds key features Petals ½ as long as the sepals, leaves pinnate into 5-7 leaflets.
Comments: Blooms 6-8.

Potentilla simplex Michaux COMMON CINQUEFOIL, aka Old-field Five-fingers, Oldfield Cinquefoil. (*simplex* Latin simple)
Habitat: Sterile soils, open woodlands, dry prairies , dry woodlands and meadows. "Common in moist and in dry places." (Fell 1955)
Description: general form Erect to creeping perennial, 2" to 12" tall, smooth forb culms thin stems trailing along the ground; long spaces between the rooting nodes leaves palmately-divided into 5 toothed leaflets flowers yellow, 5-merous, 1/3"-1/2" wide; solitary flowers on a thin stalk from the leaf axils key features Species has hairy stems and lower surface of leaflets; 5 leaflets." (ilpin) Creeping thin stems trailing along the ground, flowers solitary, 1/3" to ½" wide, from leaf axils.
Comments: Blooms 5-7, C3. Plugs are rarely available.

Potentilla tridentata Aiton (or Soland.) * CT, GA, IA, NJ, PA, NC, RI, TN, VA THREE TOOTHED CINQUEFOIL, aka Mountain Cinquefoil, Mountain White Potentilla, Shrubby Fivefingers, Wine-leaf Cinquefoil, Wine-Leaf Potentilla
Habitat: Gravel ridges and rocky acid soil, often in crevices of rocks. Forest and shores in gravelly and rocky shores
distribution: Recorded from Cook County in 1895.
Description: Erect perennial, 4-12" tall subshrub. Small white, 5-merous, 3/8" wide blooming June-September. creeping evergreen ground cover. Showy in flower and when in fall color. Burgundy red leaves in winter. Zone 2.
key features "Leaves are 3-toothed at tip; has a caudex; evergreen." (ilpin)
Comments: Blooms 6-9. C3. This species appears herbaceous, but is an evergreen subshrub. Sometimes placed in the genus *Sibbaldiopsis*. Plugs are rarely available.

PRUNUS Linnaeus 1753 **Cherry, Plum, Sloe, Peach, Apricot** From the classical Latin name for the plum tree. A genus of about 200 species of deciduous trees and shrubs, nearly cosmopolitan. Several native plums are valuable wildlife plants. *Prunus* is the larval host for the Coral Hairstreak, *Satyrium titus*, Eastern Tiger Swallowtail *Papillio glaucus*, Striped Hairstreak, and Viceroy butterflies. *Prunus* is also a nectar source for Eastern Tiger Swallowtail *Papillio glaucus*. Wild Plum flowers are a nectar source for the Great Purple Hairstreak butterfly, *Atlides halesus*

Prunus americana Marshall WILD PLUM, aka American Plum
Habitat: Open woodlands, thickets, thickets and borders of streams, swamps, and woods, edges of woods, fencerows, streambanks, roadsides. Thickets, woodlands, fencelines, roadsides. Optimum pH 7.6,
Culture: 120 days cold moist stratification. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment, or best planted outdoors in the fall. (pm 09) Moist warm stratify (35) and cold moist stratify (90-180), or fall plant, older sources note as double dormant. Transplants easily, BR or B&B.
Description: Colonial shrub or small tree, 10-24(30)', suckers profusely forming great thickets, thorny, with dense clusters of white flowers, flowers perfect, in May followed by edible red fruit with tart yellow flesh, fleshy, plums (drupes), 1-1 ¼" dia. Blooms 4,5. Zone 3. 840 seeds per pound. Has many potential problems, but none apparently serious.
Comments: Blooms 5. "Common, usually as thickets, seldom attaining tree size." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera. American Plum is a larval host for *Satyrium liparops*, the Striped Hairstreak butterfly. Attracts upland gamebirds, songbirds, game mammals, high wildlife value. Songbirds and terrestrial furbearers eat fruit. Very important food, used by ruffed grouse, grosbeaks, robins, starling, brown thrasher, thrush, cedar waxwing, black bear, chipmunk.

Prunus pensylvanica L. f. (or Linnaeus) FIRECHERRY, aka Pincherry, Bird Cherry (*pensylvanica* of Pennsylvania)
Habitat: Sand lands, recent burns, dry woods, roadsides, hillsides, and clearings, sandy soil north 1/2 of Illinois. Optimum pH 5.5. Needs full sun.
Description: Small colonial tree, 25-40', peach-like leaves, shiny red-brown "varnished" bark, abundant small white flowers followed by tiny light red sour cherries. Good bright red to yellow-red fall color. Zone 2. . Important food for: ruffed grouse, grosbeaks, robin, starling, thrasher, thrush, cedar waxwing, black bear, and chipmunk.
"A coarse shrub with erect branches growing in groups of 25 or 50 or more, only the individuals in the middle of the group attaining small tree size. It is profuse in flower but scant in fruit. only occasionally yielding an abundant crop. Not found in many places in the county: most plentiful in low places on the sandy prairies about Camp Grant but also in boggy places in the north part of the county and there at times as roadside thickets. Also known in Boone County." (Fell 1955)

Prunus pumila Linnaeus SAND CHERRY, aka Eastern Sandcherry (*pumilus -a -um* small, dwarf)
Habitat: Sandy and gravelly shores, thickets, wet soil, rocky situations, and sandy forest openings
Culture: Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09)
Description: Sprawling shrub 4-6', with dark green leaves white flowers followed by 3/4" black cherries. Good red fall color. Zone 3.

"This, the narrow leaved form, has slender, erect, willow like stems which branch but little. It closely resembles the sand cherries in Beach State Park at Waukegan and in the Indiana Dunes State Park. It grows sparingly in a low prairie west of Sugar River Yale bridge where the only other shrubs are low willows. This and the above are not separated by Jones." (Fell 1955)

Prunus serotina Ehrh. WILD BLACK CHERRY, aka Black Cherry, Rum Cherry, Wild Cherry (*serotinus -a -um* late in the year, autumnal, blooming in autumn, late flowering or late ripening, from Latin *serum*, late)
Habitat: Dry woods and fence lines, rich, moist, soil, dry gravelly or sandy soils, margins of woods, fencerows, roadsides, waste ground. "A common forest sized tree of woods and fence-rows." (Fell 1955)
Culture: Best planted outdoors in the fall, or 120 days cold moist stratification (pm 09).
Description: Large tree with dark green foliage, raceme of white flowers followed by 1/3" black cherries. typically yellow, occasionally red fall color, yellow red fall color. Zone 3.
Associates: Upland game birds (esp. ring-necked pheasants) eat fruit and buds. Songbirds eat fruit, esp. evening grosbeaks, robins, starlings, and cedar waxwings. Terrestrial furbearers eat fruit and bark. Aquatic furbearers eat fruit, bark, and wood. Small mammals eat fruit. Deer eat twigs and foliage. Important food for ruffed grouse, grosbeaks, robin, starling, thrasher, thrush, cedar waxwing, black bear, chipmunk, deer. Black Cherry is the larval host plant for the Tiger Swallowtail and the Red-spotted Purple Butterfly. Known to chemically inhibit red pine and red maple (Chick & Kielbaso 1998).

Prunus virginiana Linnaeus var. **virginiana** CHOKECHERRY (*virginiana* of Virginia)
Habitat: Fence lines , thickets, shores, and edges of woods. Optimum pH 5.5. Coarse to moderately fine soils. Best in neutral, but grows in acidic or basic soils.
Culture: Propagated by soft wood cuttings.
Description: Large, deciduous, colonial shrub or small tree, may form small thickets, 5-30', dark green leaves, raceme of white flowers in summer followed by purple to black cherries. Occasional good red fall color. Zone 2. 4,800 seeds per pound.

"Common in wet or dry situations, edges of woods, roadsides, fence-rows, railroads, etc. Our most common form is without pubescence. On the high prairie in the east part of the county there is a slightly pubescent form that has no other distinctive characters, but on boggy places north of Shirland is a very definitely pubescent form that has larger racemes and thicker peduncles and pedicels (f. *deamii* G.N. Jones). The fruit of the choke-cherry is subject to an infection that causes distortion." (Fell 1955)
Associates: Important food for ruffed grouse, grosbeaks, robin, starling, thrasher, thrush, cedar waxwing, black bear, chipmunk. Valuable cover for wildlife. Browsed by livestock and wildlife. The cherries make a passable homemade wine.

ROSA Linnaeus 1753 **Rose, Brier** *Rosa* From the classic Latin name, whose meaning has been lost, *rosa, rosae*, a name for various roses; through intermediate Greek and Italian dialects from Greek ῥόδον, *rhodon,* ῥοδέα, *rodea,* probably of Iranian origin. A genus of 100+ species of shrubs and vines of mainly north temperate regions. Roses are insect pollinated. The fruits, or hips are eaten and dispersed by birds and mammals.

Rose hips should be collected as soon they start to ripen, and the hips sliced open and the seeds removed. Excess drying, in the barn or if the hips are left on the plant and picked in late fall, increases dormancy (Dirr & Heuser 1987). The seed should then be floated and the light seed and any remaining pulp discarded. Scarify and fall plant. The seed may also be removed from the hips by macerating or by hammer milling the hips when they are dry and brittle. Brief detergent soaks before macerating help eliminate oil-soluble germination inhibitors in some species. If properly handled, seedlings emerge 1st and 2nd spring. Some species may require warm moist stratification before cold moist stratification. Seedlings should grown in a sunny breezy area, and not watered late in the day to avoid powdery mildew. Pink flowers in 2-3 years. Plants to be overwintered should be cut back to 3 inches. Code B, G, I* (Cullina2002). Fruits are fleshy hips with achenes. Flowers are born on older canes (?).

As a genus germination occurs largely at 40° F. and extends in an erratic manner over several cycles. (Deno, 1991)

Native Roses for Dummies (like me)
acicularis prickly stems & internodes flws often solitary, 2nd year side branches sepals persistent 5-7 leaflets

arkansana densely prickly stems & internodes flws terminal new wood & last years side branches sepals persistent 9-11 leaflets

blanda almost w/o thorns flws solitary, on last years side branches 5-7 leaflets, pubescent.

carolina unbranched thorns near nodes flws solitary, new growth sepals deciduous 3-7 leaflets

palustris downward curving stout thorns sepals becoming deciduous 7 finely toothed leaflets

setigera thorns along stems short, stout, slightly curved flowers terminal sepals deciduous 3-5 leaflets w/ long pointed tip hips glandular

Rosa acicularis Lindley *IL, IA BRISTLY ROSE, aka Prickly Rose, Rose (*acicularis, -is, -e* needle-like, from Latin *acicula*, a small pin for a head-dress, and *-aris*, from *–alis*, pertaining to, needle-shaped, needle pointed, slender)
Habitat: Upland woods, hills, rocky banks. Jo Daviess County only.
Description: general form Erect perennial up to 40" tall, clone-forming shrub culms stems densely prickly throughout the stem and internodes, prickles long, straight and unequal leaves pinnately-divided with 5 or 7 elliptical to oval, often twice-toothed leaflets flowers pink to dark rose, 5-merous, 1"-2 1/3" wide, only on last year's side branches, the sepals persistent; flowers usually solitary; fruits purplish smooth berry-like hips key features Prickly stems and internodes, flowers only on last years side branches. Sepals persistent, flowers usually solitary, 5 or 7 leaflets.
Comments: Blooms 6-7. C3.
Associates: Does not cause hayfever.

Rosa arkansana Porter SUNSHINE ROSE, aka Arkansas Rose, Dwarf Prairie Rose, Lunell's Rose, Prairie Rose, Wild Prairie Rose (*arkansana* of Arkansas in the USA)
Habitat: Thickets, woods. Sun to partial sun. Native of the western USA (ilpin).
Culture: Seeds exhibit physiological dormancy, cold moist stratify for 90 days, germinate at 25º C (Baskin & Baskin 2000) Seeds need scarification. 60 days cold moist stratification. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination? (pm 09)
Description: general form Erect, perennial, under 40" tall, clone-forming shrub culms stems densely prickly on most of the stem and internodes, thorns straight and unequal leaves pinnately-divided with 9 or 11 oval to oblong, sharply toothed leaflets, often fuzzy beneath flowers pink to rose, 5-merous, at the top of this year's branches and often on last year's side branches, the sepals persistent; inflorescence a wide cluster or corymb of stalked flowers key features Stems and internodes prickly, flowers at top of current branches and last years side branches, sepals persistent, inflorescence a corymb, 9 or 11 leaflets (Freckmann). Leaflets are glabrous (ilpin).
Comments: Blooms 6-7. 40,000 seeds per pound. Wild Rose is the floral emblem of Iowa. *Rosa pratincola* is the most cited taxon.

Rosa blanda Aiton EARLY WILD ROSE, aka Smooth Rose, Meadow Rose, Wild Rose (*blandus -a -um* alluring, from Latin *blandus -a -um,* flattering, caressing, alluring, tempting, pleasant, mild)
Habitat: Mesic and dry savanna, woods, open areas wet thickets, moist sites. Optimum pH 6.5
Culture: Seeds need scarification. 60 days cold moist stratification. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination? (pm 09) "Double Dormant. Field sow fall." (pn nd) Scarify, fall plant, double dormant. Cold moist stratify (300 days) is reported.

Seeds should be removed from the hip as soon as possible, the pulp floated off, and dried for one week. Scarify by pouring boiling water over the seeds and steep for 24 hours. Place seed and an equal volume of moist perlite or vermiculite in an airtight container and store at room temperature for 1 month followed by cold moist stratification for 4 months at 33-42ºF. (Schultz et al. 2007) Soft wood cuttings, division.
Description: general form Native erect colonial rose with few thorns culms 3' to 4' (5-6), stems mostly without thorns or with thin thorns only at the bottom internodes leaves pinnately-divided with 5 or 7 oblong, coarsely-toothed leaflets flowers clear pink, occasionally white, 5-merous, 1 1/2"- 2 1/3" wide, only on last year's side branches, the sepals persistent; inflorescence either solitary or in a wide cluster (corymb) of stalked flowers key features Stems mostly without thorns, flowers on last years side branches, sepals persistent, 5 or 7 leaflets. (Freckmann) "Flowers are also solitary; prickles absent on flowering branches, although often present near base of plant, leaflets pubescent" (ilpin).
Comments: Blooms 5-7. C3. Shrub, ethnobotanical uses, landscaping, aggressively colonial. To zone 3. 41,600 to 75,600 seeds per pound. "Not common. Usually in thickets or the brushy edge of woods. West of Shirland near Winslow bridge and in a thicket near "north ledges" of Kinnikinnick Creek. Rather tall, erect, not much branched, few prickles. Sepals erect in fruit which is smooth." (Fell 1955)
Associates: Butterflies-upland game birds and songbirds. Used by grouse, prairie chicken, and deer. Cover for nesting/roosting.

Rosa carolina Linnaeus PASTURE ROSE, aka Carolina Rose (*carolinus* referring to or from the Carolinas)
Habitat: Mesic, dry, hill, sand, and mesic prairies, dry woods, and fields. Full sun, dry to moderate moisture, upland woods, prairies, inland sands, roadsides.
Culture: Seeds need scarification. 60 days cold moist stratification. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination? (pm 09) "Double dormant. Field sow fall." (pn nd) Fall plant, double dormant, cold moist stratify (300 days) is reported. Flood et al. (2001) report cold moist stratification 3-4 months at 34-36º F. Grabowski (2001) with Mississippi seed, used fresh, barely ripe seed, scarification in concentrated sulfuric acid for 45 minutes, and cold moist stratification for 3 months. Plants should be watered in the morning to allow the foliage to dry to avoid powdery mildew. Soft wood cuttings, division, some say best from cuttings.
Description: general form Native erect, perennial, 1/2'-4' tall, clone-forming shrub usually unbranched or with only a few branches culms stems with straight, slender, rounded thorns near the nodes leaves pinnately-divided with 3-7 oblong to rounded, coarsely toothed leaflets flowers white to pink 5-merous, 1 1/2"-2 1/3" wide, on this year's stems, the sepals deciduous; flowers solitary key features Stems usually unbranched, rounded thorns near nodes, flowers on this years stems, sepals deciduous, 3-7 leaflets (Freckmann). "Flowers are solitary; lower leaf surface is glabrous or sparsely pubescent; leaves are coarsely toothed." (ilpin)
Comments: Status phenology Blooms 5-8. C3. Various shades of pink, landscaping. Small colonial rose with few thorns, red fall foliage color and bright red hips thru the winter. 40,000 (pm2002); 46,400 (pn2002 & jfn2004); 874,400 seeds per pound.

"The most common rose throughout except on dry prairies where *R. suffulta* is more frequent. It is very stoloniferous and has infrastipular prickles which are straight." (Fell 1955)

Associates: Pollinated by bees, Coleoptera. Attracts upland game birds, songbirds, and ungulates. Seeds are dispersed by birds and mammals.

Rosa multiflora Thunb. ex Murray MULTIFLORA ROSE, aka Japanese Rose (*multiflora* many-flowered)
Habitat: Sun to partial shade, pastures and woods distribution: Introduced from Asia.
Culture: Rude and uncultured. Germination is enhanced by passing through a birds digestive tract.
Description: general form Arching perennial, 5'-12'tall shrub, forming dense clones culms very prickly with curved thorns; stems bright green to reddish leaves pinnately-divided with 5-11 elliptical, toothed, leaflets to 1" long flowers white, 5-merous, ½ "-1 ¼ " wide, sepals becoming deciduous; inflorescence of many stalked flowers in large, branched clusters or panicle, fruits are smooth, red berry-like hips key features Stems very prickly, stems bright green to reddish, white flowers, sepals becoming deciduous, 5-11 leaflets (Freckmann). "Styles are united into a column; many flowered inflorescence; stems are climbing or scrambling; prickly; 7-9 leaflets" (ilpin). Stipules barbed.
Comments: Introduced - escaped; ecologically invasive and nuisance weed with a tenacious and unstopable growth habit. Blooms 5-6. "A hardy native of Asia which has recently been extensively planted in the county for hedges and for wildlife purposes. Particularly in prairie areas it tends to spread rapidly and will doubtless soon become established." (Fell 1955)

To eradicate, burn, cut and herbicide, treat foliage with brush herbicide, or pull or dig young plants.

Associates: Proides cover for pheasants, bobwhite quail, and cottontail rabbits. Provides food for songbirds.

Rosa palustris Marshall *IA SWAMP ROSE (*paluster -tris -tre* marsh-living, marsh-loving, of swamps, swamp loving, of marshes, or growing in bogs, bog-loving, from Latin *paluster -tris -tre* marshy, boggy, of swampy ground, from *palus*, *paludis*; *palustris* is often used as a masculine ending in plant names.)
Habitat: Fens and borders of wetlands, swamps, bogs, and wet thickets. "Not unusual on streambanks and other wet places." (Fell 1955) Tolerant of medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 4.0-7.0.
Culture: Seeds need scarification. 60 days cold moist stratification. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination? (pm 09) Cold moist stratify (60) / fall plant easy from seed, soft wood cuttings. Growth rate moderate. Seedling vigor medium. Vegetative spread rate slow. Spreads slowly from seed.
Description: general form Subshrub, erect perennial, 3'-7' shrub, with many branches roots 18" minimum root depth culms stems with downward curving, stout thorns usually only near the nodes leaves pinnately-divided with usually 7 finely-toothed leaflets, yellow-orange to red fall color flowers deep rich pink, 5-merous, 1 1/2"-2 1/3" wide, sepals becoming deciduous; inflorescence solitary or in small, wide clusters or corymbs of stalked flowers, fruits smooth, 1/2-1" red berry-like hips persisting thru winter key features thorns downward curving, stout; thorns only near the nodes; sepals becoming deciduous; leaflets 7, finely toothed (Freckmann). "Sepals reflexed after flowering, rarely persisting on mature fruit; stout thorns; mostly 7-leaflets" (ilpin).
Comments: Blooms 6-8. C3. Aggressive, rhizomatous, thorny, profuse flowering, wetland restoration. 25,600 to 100,576 seeds per pound.
Associates: Low palatability to browsing animals.

Rosa setigera Michaux *MI ILLINOIS ROSE, aka Climbing Rose, Climbing Prairie Rose, Climbing Wild Rose, Prairie Rose (*setigerus -a -um* New Latin bearing bristles, from Latin *saetiger -gera -gerum*, having bristles, bristly, from *seti-*, bristle, and *-gero*, bearing.)
Habitat: Sand and mesic prairies, mesic savannas, and wetland borders, occasionally in sedge meadows, woods, thickets, and clearings. "Very uncommon, we having found it only in the lower end of Killbuck bottom in the forest preserve and in the adjacent slough area." (Fell 1955) Tolerant of coarse and medium textured soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement medium. Salinity tolerance none. Shade tolerance none or partial shade. pH 5.0-7.0. distribution: Considered introduced in Wisconsin.
Culture: 60 days cold moist stratification (pm 09). Cold moist stratify or fall plant, easy from seed, soft wood cuttings. Our propagation experience with this species has been approximately 50% germination the first spring after dormant seeding. GA3 on dry stratified northern Illinois seed seems to work well. (gni unpublished greenhouse data) Growth rate rapid. Seedling vigor high. Vegetative spread rate none. Spreads slowly from seed.
Description: 2.0-6', long sprays of clear pink (rarely white) flowers, 5-merous. "Prickles are sparse; styles are in a column; 3-5 leaflets." (ilpin)
Comments: Status phenology Blooms 5,6,7. C3. Useful in landscaping. Arching canes like a Blackberry, rambling rose, rooting at the tips. 6" minimum root depth. We have seen wetland specimens to 8 feet, and this rose rambling up a tree to 15' in Spoon River floodplain. 50,000 (usda); 73,168 to 160,000 (pm2002) seeds per pound. Zone 4. Some say best established from cuttings, but *au contraire* Mooseface! Although Jock at LaFayette first made this species available in the 1970's with stock from McCune Sand Prairie, the USDA disavows any knowledge of commercial availability. *Kudos* on keeping up with the industry.
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Coleoptera. Attracts songbirds.

Rosa suffulta Greene SUNSHINE ROSE (*suffultus -a -um* in botany propped up, supported, from Latin *suffultus*, past participle of *sulficio, suffulcīre, suffulsi, suffultum,* to prop, confused with *suffarcināre* to stuff.)
Culture: Remove seed from fresh hips, scarify, cold moist stratify seed. Division of rootstock and softwood cuttings with a heel treated with hormone.
Erect, spreading, prickly branched with pinnate compound leaves turning maroon in fall. Less woody than other *Rosa* species, often dying back to the ground annually key features "species is prickly; leaves are pubescent (ilpin).
C3. "The most common rose on dry prairie. It is half hardy, is low and branched, but no prickles and the flowers are large. (*R. pratincola* Greene) (*R. arkansana* Porter var. *suffulta* Greene)" (Fell 1955)

RUBUS Linnaeus 1753 **Blackberries, Dewberries, and Raspberries, Bramble** From the Latin name for blackberry. Deciduous and evergreen shrubs. Blackberry flowers are a nectar source for the Pipevine Swallowtail, *Battus philenor.*
Rubus spp. "We have made no effort to separate the doubtless numerous varieties and forms of the Rubus complex. An excellent study of a small area is found in Hanes' Flora of Kalamazoo County Michigan. Our experience suggests that such extensive splitting does not occur in northern Illinois except possibly in the *Hispidus* group. The *Flagellares* and *Allegheniense*s are less variable." (Fell 1955)

SANGIUSORBA Linnaeus 1753 **Burnet** From Latin *sanguis*, blood, and *sorbe, sorbeo* to absorb, to soak up, from the plants stipic qualities, its ability to stop bleeding. 15 or more species of herbs native to Eurasia, N. Africa, and North America, with odd-pinnate stipulate leaves and small apetalous flowers in dense terminal spikes or clusters.

Sanguisorba canadensis Linnaeus *GA, IL, IN, KY, ME, MD, MI, NC, RI, TN, VA AMERICAN or CANADA BURNET, aka White Burnet (of Canada or northeast USA.)
Habitat: Very rare. Moist prairies, wet meadows. Native in many states east of the Mississippi and in Alaska, Idaho, Oregon, and Washington.
Culture: Cold moist stratification (Wade 1995) Cold moist stratify or fall plant, root cuttings.
Description: Erect perennial, 4.0-5.0'. Terminal spike of small white flowers
Comments: Blooms 7-10 Flowers are showy, good for cut flowers, attractive dried seed heads. 566,992 seeds per pound.

SORBUS Linnaeus **Mountain Ash, Service tree** *Sorbus* From the classical Latin name for the Service Tree, *Sorbus domestica.* About 250 species of deciduous trees and shrubs, mainly temperate Northern Hemisphere. Mountain Ash is a larval host for the Eastern Tiger Swallowtail *Papillio glaucus*.

Sorbus americana Marshall AMERICAN MOUNTAIN ASH, aka American Rowan, Mountain Ash (*americanus -a -um* of the New World, American)
Habitat: Moist soil on river banks, borders of cold swamps, rocky hillsides and mountains, rocky woods. Optimum pH 5.6. Needs moist open site to show well. Adaptable.
Description: Small to medium (10-20') flat topped tree. Creamy white flowers in large corymbs at ends of branches, followed by flat clusters of BB sized brilliant orange red pomes. Red berries persist into winter. Slow grower. Leaves

have a bright orange-red fall color. Branches and lower leaf surfaces glabrous, or inconspicuously and sparsely pubescent. Winter buds glutinous. Zone 2.

It is used in highway and in ornamental planting and all the trees that we have seen in Winnebago County and in Ogle County that have plainly been planted. We have been unable to find it in the sand area of Sugar River where it was reported by Gleason." (Fell 1955)

Sorbus decora (Sarg.) C.K. Schneid. SHOWY MOUNTAIN ASH, aka Northern Mountain Ash (*decorus -a -um* elegant, comely, becoming, beautiful)
Description: Much like American Mountain Ash, but coarser tree, to 45', larger flowers and fruit clusters. Pomes deep red. Fall foliage color red.

SPIRAEA Linnaeus 1753 **Spiraea, Meadowsweet, Hardhack** *Spiraea* a plant used in garlands, from Greek *speiraira*, a wreath spiraled or twisted, for the twisted seed pods of some species. Also spelled *Spirea*. A genus of about 80 species of deciduous shrubs of north temperate regions especially Asia. "Fall sow or cold moist treatment, very light cover, good to fair germination. (mfd 1993)

Spiraea alba Du Roi MEADOWSWEET, aka White Meadow Sweet, Narrow-Leaved Meadowsweet (*albus -a -um* from Latin white, *albus*, particularly a dull rather than a glossy white, or, dead white; pale)
Habitat: Wet meadows and ditches; wet prairies, open habitats with wet soil. "Common in moist ground in sand and prairie areas." (Fell 1955)
Cultivation: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) No pretreatment necessary. Good germination upon sowing. (Dirr & Heusser 1987). Germination best with dry stored seed started at 70º F. in the dark. Fresh and dry stored seed germination after 90 days cms 40º F. Fresh seed at 70º germinates low. (Deno, 1991) *S. betulifolia* is fall sown and germs the following spring (Young & Young 1992). Dry storage 70 (180) or cold moist stratify (90), fall plant gives some results, scarify may help-easiest by cuttings, division hard wood cuttings, soft wood cuttings. Occasionally self sows. Meadowsweet is usually propagated from cuttings, a real no brainer. Transplants easily.
Description: general form Erect perennial shrub, suckering colonial, 1.0-3.5' culms Stems dull brown. New bark red in winter leaves alternate, not divided or lobed, oblong to lance-like, 3 to 4 times as long as wide, smooth, edges with fine, sharp teeth, yellow red fall color flowers white, 5-merous, 1/4" wide, slightly fuzzy; flowers perfect, inflorescence a 5" terminal, branched panicle-like cluster, fruits are pod-like follicules, 1/8" long in clusters of 5, with many tiny seeds key features flowers white, leaves not divided or lobed, 3-4 X as long as wide, smooth.
Comments: Blooms 6-9. Terminal "cones" of white flowers. Good naturalizing shrub in wetlands. Ethnobotanical uses, landscaping, shrub. 300,000 to 6,250,000 seeds per pound.
Associates: Pollinated various insects, esp. Diptera and Hymenoptera. Attracts upland gamebirds, low wildlife value. Flowers provide nectar for Acadian Hairstreak, *Satyrium acadica*, Edward's Hairstreak, *Satyrium edwardsii*. Subject to fire blight and other problems, none seriously damaging.

Spiraea tomentosa Linnaeus var. **rosea** (Rafinesque) HARDHACK, aka Steeplebush, Hardhack Spiraea (*tomentosus –a –um* tomentose, densely woolly, pubescent)
Habitat: Sterile low grounds and pastures, bogs, moist thickets, rare. Marsh, streambank, and waters edge species; bogs, moist thickets and meadows, wet sandy swales
Cultivation: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Transplants easily. Cold moist stratify 60 days (Wade)
Description: general form Erect perennial, colonial, 2'- 3 ½ ' tall shrub leaves alternate, not divided or lobed, oblong to lance-like, green above, whitish-orange fuzz beneath, edges with fine, sharp teeth flowers clear pink to rose purple, 5-merous, 1/8" wide, flowers perfect; inflorescence a 5" terminal, branched panicle-like cluster, fruits are woolly, pod-like follicules, 1/8" long in clusters of 5, with many tiny seeds.
Comments: Blooms 7-9. 4,480,000 to 14,400,000 seeds per pound.
Associates: Pollinated various insects, esp. Diptera and Hymenoptera. Subject to fire blight and other problems, none seriously damaging.

RUBIACEAE A. L. Jussieu 1789 **Madder family** From *rubia* red, from *ruber*, a name used by Pliny for madder. Whatsamaddau?

CEPHALANTHUS Linnaeus **Buttonbush** *Rubiaceae Cephalanthus* flowers in a head from Greek *kephale*, head, and *anthos*, flower, for the flowers in a head-like spike. A genus of about 6 species of tropical and temperate America.

Cephalanthus occidentalis Linnaeus BUTTON BUSH, aka Common Button Bush (*occidentalis is -e* of the west, western, from Latin *occidens*, *occidentis*, noun, the west, towards the setting sun, and *-alis,* adjective suffix of or

pertaining to, as opposed to *orientalis* of China.)
Habitat: Wet meadows, upland swamps, streams, lake shores, swamps, ponds, sloughs, backwaters of rivers; wet ground, margins of swamps, ponds, and marshes, backwaters of rivers. Can tolerate water depths of 2-3'. Tolerant of permanently to semi-permanently flooded conditions. 10" seedlings have been known to survive complete submergence for up to 45 days, but don't push this. Nutrient load tolerance moderate, Salt tolerance moderate to high. Siltation tolerance moderate. Partial to full sun, tolerant of some shade, but may decline.
pH 6.0-8.5.
Culture: Seed needs no treatment, just good seed soil contact, light, easy by cuttings (a real no brainer, put stick in soil, stick grows, sometimes even when planted upside-down). Common buttonbush ripens in September and October. Some say seed should be stored in fresh water at 34°F, but we do not see this as necessary. Germination is prompt with no pretreatment. Germination epigeal. (Young & Young 1992) No pre-treatment necessary other than cold, dry stratification (pm 09). Collect fruits when red-brown, dry and store in airtight containers or sow immediately. No pretreatment needed. Seeds will germinate in 10-14 days. (Dirr & Heusser 1987) Buttonbush has an absolute requirement for light. Fresh seed, cold stored seed, and warm stored seed germ. Equally well. (Deno 1991) Can be direct seeded on wet mudflats and shorelines. Can be established from cuttings, but cuttings need time to root before flooding. Rooted cuttings survive well. Small seed grown plugs may be planted directly on site on as close as 5' centers. Growth rate medium, 1-2' per year. Plant with caution, may form monocultures. Seed and transplants may have occasional limited availability. Transplants easily, BR and B&B.
Description: "Tropical" appearing large wetland deciduous shrub, almost a small tree, 3-15'; globes or round clusters of white flowers in summer, June to August followed by balls of seed. White flowers perfect, occasional plants have red seed heads, one of last plants to leaf out in spring, needing temps near 80˚ F. Zone 3. Blooms 6,7,8. Landscaping, wetland restoration, useful in lower and upper shoreline zones, and for stream bank stabilization, potentially aggressive. Fruit is a round cluster of small capsules, 1" diameter. 96,000 to 200,000 seeds per pound. "It is common on streambanks, sloughs, and other wet places often forming dense thickets in shallow water but is never more than a sprawling shrub. Sloughs of Sugar and Pecatonica Rivers and Killbuck Creek," (Fell 1955).
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera Seeds provide food for insects, beavers, and muskrats. Plants provide nectar and habitat for insects. Good nesting habitat for birds. Attracts marsh birds and shorebirds, of low wildlife value; Waterfowl, marshbirds, and shorebirds eat the seeds. Aquatic furbearers (esp. beavers) and deer eat the twigs and foliage. Browsed by deer, muskrat, and beaver. Attracts bees and butterflies. No serious insect or pest problems.

GALIUM Linnaeus 1753 **Bedstraw, Cleavers, Woodruff** *Rubiaceae Galium* New Latin, from Greek *galion*, *galium, -galium*, bedstraw, from Greek *gala* milk. *G. verum*, Lady's Bedstraw, was used to curdle milk. 300 species of annual and perennial herbs, cosmopolitan. Fruits are nutlets. Bedstraw filled the manger in Bethlehem. Bedstraw species were used as a mattress stuffing because the clinging stems hooked together and did not matt.

Galium boreale Linnaeus NORTHERN BEDSTRAW (*borealis -is -e* northern, of the North Wind, of the North, from Greek βορεας, *boreas*.)
Habitat: Wet meadows, wet and mesic prairies, shores, woodland borders. distribution circumboreal
Culture: **"**Cold moist treatment, or fall sow, or no pretreatment necessary. Light cover. Very good germination." (Dunham 1993) No pre-treatment necessary other than cold, dry stratification (pm 09). No treatment or stratification necessary, division.
Description/comments: White flowers pollinated by Diptera, Lepidoptera, and sawflies. 1.5-2.4'. Blooms 5-8. Cut flowers, landscaping, ground cover, aggressively rhizomatous, spreading readily. 1,008,000 to 1,280,677 seeds per pound. "Common and the most showy species, growing on low prairies and in low places on railroads, etc." (Fell 1955)

Galium concinnum Torrey & A. Gray SHINING BEDSTRAW, aka Pretty bedstraw (*concinnus -a -um* well made, well put together, well arranged, pleasing, pretty, elegant, neat, especially of style.)
60 days cold moist stratification (pm 09). "Much branched, leaves in 6's, linear and often cuspidate. Common in dry woods and thickets; Rock Cut, woods south of Argyle and in oak woods west of Shirland." (Fell 1955)

HOUSTONIA Linnaeus 1753 **Bluets** *Rubiaceae Houstonia* New Latin, from Dr. William *Houston* died 1733 Scottish (English) botanist who collected in tropical America, and New Latin *-ia*. North American herbs with entire leaves and small blue, lilac, or white tubular lobed flowers. "The generic limits of *Houstonia, Hedyotis, Oldenlandia*, and *Stenaria* remain unclear." (Weakley 2008)

The very small seed ripens in summer. Cold moist stratification and surface sow. Code B, H. (Cullina 2000)

Houstonia longifolia Gaetner LONGLEAF BLUETS (*longifolius -a -um* with long leaves.)

No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) 4,800,000 seeds per pound. "Our only species and rare. The gravel bluffs south of Roscoe. Also reported in a similar situation north of Rockford Country Club but we have not found it there. S.E of Cherry Valley in Boone County." (Fell 1955 as *H. lanceolata* (Poir.) Britt.)

SALICACEAE de Mirbel 1815 **Willow Family**

SALIX Linnaeus 1753 **Willow** *Salicaceae*

Salix humilis Marsh. PRAIRIE WILLOW, aka Small Pussy Willow
Habitat: Prairies, open woods, rocky slopes.
Culture: Soft wood cuttings. Transplants easily, BR.
Description: Shrub 4-12'. Flowers dioecious, pollinated by long-tongued bees, short-tongued bees, Diptera, Coleoptera; blooms March to May. Fruit are capsules 0.25-0.38" long, releasing many plumed seeds. Early flowers attract native bees; attracts upland game birds, songbirds, game mammals, and small mammals; Many bacterial, fungal diseases, insect pests. Mohlenbrock lists 2 varieties as well as the species. Reeseville lists *S. humulis* as BARRENS WILLOW, native to the pine barrens, as being larger than PRAIRIE WILLOW, var. *microphyllus*. 3-7" gray green leaved shrub, very dense form, wet or dry soils, good display of 0.5" male catkins in spring. Plants are of both sexes. Zone 3 One of many good native willows for planting

SANTALACEAE R. Brown 1820 **Sandalwood Family** A family of about 34 genera and 540 species of trees, trees, shrubs, and herbs of tropical and warm temperate regions of the Old World and New World. All members of the Sandalwood family are hemiparasitic.

COMANDRA Nuttall **Bastard-toadflax** *Santalaceae* New Latin, from Latin *coma* hair, or Greek *kome*, hair, and New Latin *–andra* from Greek *ander*, man; from the hairy calyx lobes that are attached to the anthers, or the hairy attachment of the stamens. Two species, one North American, one European, of herbs that are usually partial parasites attaching to other plants by underground holdfasts and that have creeping stems, whitish flowers in terminal clusters, and a dry nut as fruit. *Comandra umbellata* is the alternate host for *Comandra* stem rust of pines.

Seed is rarely for sale, only in small quantities, and not available every year. Prairie Moon is increasing its production. Seed is seldom seen in the wild, possibly suggesting many colonies are self incompatible clones.

Comandra umbellata (Linnaeus) Nuttall BASTARD TOADFLAX aka False Toadflax, Toadflax (*umbellatus -a -um* in umbells, umbrella-like flower heads, umbelliferous, from Latin *umbella*, umbrella, "a little shadow", and *-atus*, possessive of or likeness of something, for the flowers appearing to be in umbels.)
Habitat: Hill and sand prairies, sandy Black Oak savannas, dry to mesic prairies, open woods, prairie fens. Mesic to dry prairies and open woodlands.
Culture: Propagation is difficult from seed due to parasitic nature, exact methods are unknown. Hemiparasitic. Cold moist stratify 60 days. Suggest inserting stratified seed into a slit in plug of a host plant, and placing the seeded plug in a restoration. Use mycorrhizal inoculated soil in the plug mix. One may wish to "borrow" a little soil from a remnant where this grows to inoculate your planting site. 60 days cold moist stratification. Parasitic species which needs a host plant. (pm 09) Salvaged materials transplant with care.
Description: general form Erect perennial subshrub, 4-12" roots rhizomatous, horizontal underground rootstock with slender parasitizing suckers culms simple or with some branches leaves alternate or scattered, 0.75 to 2", lance-like to oval flowers white, 5-merous, 1/4" wide; inflorescence of many flowers in a tight, terminal cluster; fruit a dry, single seeded berry key features Flowers in a tight terminal cluster, fruit dry.
Comments: Blooms late April to early July. Fruits in July. Spreads by rhizomes and may often form dense stands, 11,200 seeds per pound. Fruit is a small nut (or a dry, single-seeded berry or drupe).

"We have only this species which is common in open woods and thickets and low and dry prairies." (Fell 1955)

Bastard Toadflax is a facultative, hemiparasitic generalist. Henderson (2002) suggests that toadflax is a keystone species in reducing the dominance of aggressive grasses and promoting high diversity in remnants. Toadflax parasitizes many species, including trees and shrubs, at varying levels of impact. In North Dakota, fringed sage and northern wheatgrass are known hosts. Other hosts include *Acer, Betula, Aster, Antennaria, Carex, Fragaria, Populus, Rosa, Rubus, Solidago, Vaccinium,* and various grasses (E.H. Moss, 1926, "Parasitism in the genus *Comandra*". *New Phytologist* 25: 264–276). Restorations trying to establish this species should consult the lengthy plant associates lists in Swink & Wilhelm, 1994.
Associates: Pollinated by long-tongued bees, short-tongued bees, Diptera, Lepidoptera, Coleoptera. Larval host of Common Buckeye (*Junonia coenia*). The fruits are said to have a sweet taste, but it may be a facultative accumulators of selenium. Small mammals eat the seeds.

Adventitious roots, working with fungi, form button-like *haustoria*, that wrap around the root or rhizome of a host plant, and penetrate it to absorb nutrients.
VHFS: Ours is subspecies *umbellata*, which ranges from the Great Plains to the Atlantic. Subspecies *pallida* grows from the Great Plains west and subspecies *california* grows in the far west.

SAURURACEAE E. Meyer 1827 **Lizard's-tail Family**

Saururus cernuus Linnaeus LIZARD'S TAIL, aka Water Dragon (From Latin, *cernuum*, nodding, from *cernuus*, inclining the head, stooping.)
Description: 5,500,000 to18,916,667* seeds per pound.

SAXIFRAGACEAE A. L. de Jussieu 1789 **Saxifrage Family**

HEUCHERA Linnaeus 1753 **Alumroot, Coralbells** *Saxifragaceae* After 18th century German botanist and physician Johann Hienrich von Heucher (1677-1747). North American perennial herbs having basal cordate or orbicular leaves and small panicled flowers with petals entire or lacking.
Cold moist stratification gives quick and consistent germination. Code A or B, H. (Cullina)

Heuchera richardsonii R. Brown PRAIRIE ALUM ROOT, aka Alum Root, Midland Alumroot, Rough Heuchera, Rough Alumroot
Habitat: Mesic and dry prairies, open woods, dry to wet prairie and open, often rocky woodlands.
Culture: "Prefers cooler soils: sow early spring or late fall. Very light cover. Tiny seeds. Good germination." (Dunham 1993) 30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm 09) "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pn nd) Easy from fresh or dry stratified seed, cool soils, light, division cold moist treatment, fresh seed, or fall sow. #1 and 3#, small seeds but easily established, blooms 2nd year, division of roots in spring or fall, can divide stolons in fall or spring, cuttings in mid summer, light or scarification only treatment necessary. (Prairie Prop Hndbk)
Fresh seed or dry stratification. Sow seeds on surface of soil, light is needed for germination. Seeding heavily may lead to damping off. Mature plants can be divided with sharp knife after seed has been produced. Each root section should have a bud. Transplant in spring or fall. (The Prairie Garden)
Description: Green flowers pollinated by bees, 2.0-3.0', blooms 5-7, landscaping, rock gardens. 6,931,297 to 12,800,000 seeds per pound. Fruit is capsule with small seeds. "Common, growing in a great variety of situations, wet and dry, preferring low prairies and dry banks and cliffs. There is a material variation as to pubescens and even in the floral characters. Some of our plants resemble *H. hirsuticaulis* (Wheelock) Rydb." (Fell 1955)

MITELLA Linnaeus **Miterwort** *Saxifragaceae* from the diminutive of Greek *mitra,* a cap, referring to the fruit. Perennial herbs.

Mitella diphylla Linnaeus BISHOP'S CAP, aka Mitrewort, Two-leaved Miterwort
Habitat: Mesic woods, swampy woods, shades calcareous rocky slopes, calcareous springy woods, wet mesic to dry mesic savanna and woodlands.
Culture: Cold moist stratify 60 days (Wade 2001).
Description: White flowers, 6-16", Blooms 4-6, 896,000 seeds per pound. "Frequent in ravines of Kishwaukee River and Hall, Grove, and the Kinnikinnick Creeks, but not elsewhere in the county. In similar situations in Boone and in Stephenson counties." (Fell 1955)

TIARELLA Linnaeus **Foamflower** *Saxifragaceae*
The hydrophilic seeds ripen late spring to early summer. Collect seeds when lower capsules begin to turn brown and papery. The seeds should be sown immediately or stored in a ziplock bag to sow outdoors in the fall. Fresh sown seed germinates in about one month. Viability drops if seeds are allowed to dry. Small seedlings will need fertilized. Code A or B*. *Tiarella cordifolia* stolons can be rooted in summer. Each cutting must have at least one leaf. (Cullina 2000)

SCROPHULARIACEA A. L. de Jussieu 1789 **Snapdragon or Figwort family**

Where have all the figworts gone?
Long time passing
Where have all the figworts gone?
Long time ago

Where have all the figworts gone?
Girls have picked them everyone.
When will they ever learn?
When will they ever learn?
after Pete Seeger, Where Have All The Flowers Gone ©1961 (Renewed) Fall River Music Inc

AGALINIS Rafinesque 1836 **Agalinis, Purple-foxglove** *Scrophulariaceae* Placed in the *Orobanchaceae* by some authors. This genus was formerly included in *Gerardia*. *Agalinis* wonder-flax, or remarkable flax, New Latin, irregular from Greek *aga, agē-* wonder and Latin *linum* flax. About 40 species of flax-like, hemi-parasitic American herbs with opposite sessile leaves and irregular tubular mostly purple flowers. Annual species hosts include grasses and composites.

Agalinis purpurea (Linnaeus) Penell PURPLE FALSE FOX GLOVE, aka Purple Gerardia, Smooth Agalinus (*purpureus -a -um* purple, reddish-purple, from Latin *purpureus*, purple colored, dark red, dark brown, clad in purple, gleaming, bright, beautiful, for the purple flowers.)
Habitat: Wet savannas, moist sandy or peaty areas, and mesic, wet mesic and wet prairies. "Common in the boggy places in Coon Creek bottom; quite uncommon in the Searle Tract and elsewhere in the county." (Fell 1955 as *Gerardia purpurea* L.)
Culture: Seeds germinate after about 60 days of cold, moist stratification (Heon et al. 1999). Moist cold stratify / fall plant-light (Code C, D Ken Schaal)
Description: Annual, lavender to pink flowers 0.8-1.5'. Blooms 8-10. Collect seed Oct-Nov. Calcareous soils. 8,800,000 seeds per pound.

Agalinis tenuifolia (Vahl.) Rafinesque SLENDER FALSE FOX GLOVE, SLENDER GERARDIA (*tenuifolius -a -um* slender-leaved, from Latin *tenuiflolius*, from *tenuis, tenu-*, thin, fine, slim, slender, *-i-,* and *folius*, leaf.)
Habitat: Dry mesic, mesic wet mesic, prairie, and savanna. Calcareous soils.
Culture: 60 days cold moist stratification. Seeds are very small or need light to naturally break dormancy and germinate. Parasitic species which needs a host plant. (pm 09) (Code C, D Ken Schaal) (Code J or C Heon, 1999)
Description: Erect annual, with pink-rose flowers, ½ to 2', blooms 8-10. 9,265,306 to 12,800,000 seeds per pound.
"More common than the two preceding (*A. papercula* and *A. purpurea*) and in the same places. Frequent in the sand area and not uncommon in Kent Creek bottom. Besides the two varieties, *parviflora* Nutt. and *macrophylla* Benth., we have, growing at the edge of a wood on Cunningham road west of Rockford in a moist situation, plants that do not blacken upon drying and that otherwise differ materially from the above but which seem to be of this species." (Fell 1955)

Besseya see *Wulfenia*. ***Besseya*** Charles Edwin Bessey, American botanist (1845-1915), student of Asa Gray, botany professor at Iowa Agricultural College and the University of Nebraska, president of the AAAS, introduced the systematic study of plant morphology as the basis of modern plant taxonomy. Also wrote *The Geography of Iowa* (1876)

CASTILLEJA Mutis ex Linnaeus f. **Indian Paintbrush** *Scrophulariaceae* Placed in the *Orobanchaceae* by some authors. *Castilleja* for Professor Domingo Castillejo, 1744-1793, Spanish botanist and instructor of botany at Cadiz, Spain; alternately New Latin, irregular, from Juan *Castillo* y López, with the influence of Spanish *-eja*, diminutive suffix. About 200 species of hemiparasitic herbs, primarily of western North America, but with a few species in eastern North America, Eurasia, Central America, and Andean South America.

Some success by outdoor stratification, sometimes with the germination occurring second summer which may indicate some species require multiple cycles. Some species (not ours) may be grown without a host. Code B (D?) Seed matures summer to fall (4-6 weeks after flowers fade). (Cullina 2000) Inquiring minds should consult the associate lists in Swink & Wilhelm (1994).

Castilleja coccinea (Linnaeus) Spreng INDIAN PAINTBRUSH, aka Eastern Indian Paintbrush, Scarlet Painted Cup, Painted Cup (*coccineus -a -um* Latin scarlet, red, deep red, deep carmine red, from Latin *coccineus*, scarlet.)
Habitat: Prairies, sand prairies, calcareous sand flats.
Culture: Parasitic, cold moist stratify, rake into or scatter on prairie sods in fall. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Parasitic species which needs a host plant. (pm 09)
Description: Erect annual/perennial. 4,800,000 seeds per pound. "Not uncommon in low prairies and boggy places in Coon Creek bottom but not seen elsewhere. Our plants are all yellow bracted." (Fell 1955)

Castilleja sessiliflora Pursh DOWNY PAINTED CUP, aka Plains Paintbrush (*sessiflorus -a us* with sessile flowers, or stalkless flowers)
Habitat: Calcareous hill prairies, sandstone prairies.
Culture: Needs to be planted with the seeds of another plant, such as Blue Gramma. Sow in fall or cold moist stratify

30-60 days and spring sow. (pots 2000) 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Parasitic species which needs a host plant. (pm 09) Scratching these seeds into an existing dry planting has given some success at our nursery. Chris Bronny moved this around Nachusa Grasslands years ago, from Sheaffer's Knob to Doug's Knob. Chris was the first TNC onsite intern. "A deep rooted, dry soil perennial that has several stems and is less than a foot tall. Known only on the gravel hills east of Ill. Rt. No. 173 north of Loves Park." (Fell 1955)
Description: Partial root parasite on grasses. 3,200,000 seeds per pound. Ours grows next to a *Silphium laciniatum*.

CHELONE Linnaeus **Turtlehead** *Scrophulariaceae* Sometimes placed in the *Plantaginaceae. Chelone* New Latin from Greek χελώνη, *chelone*, tortoise, the corolla is shaped like a turtle's head. Perennial herbs.

Cold moist stratify at 90-120 days. Very light cover. Code B, H. (Cullina 2000)

Chelone glabra Linnaeus *NY TURTLEHEAD, aka White Turtlehead (*glaber, -bra, -brum* glabrous, lacking hairs, smooth, bare, from *glaber, glabri*, Latin for bald.)
Habitat: Wet meadows, fens, and marshes. Wet woods, swamps.
Culture: "Cold moist treatment, or fall sow. Very light cover. Variable germination." (Dunham 1993) 120 days cold moist stratification. Best planted outdoors in the fall. (pm 09) Fall plant or cold moist stratify (90-120). Seeds require light. 2 node stem cuttings work well.
Description: Narrowly pyramidal spike of white flowers, 3.0-4.0'.
Comments: Blooms 8,9. Seed matures fall. Cut flowers, landscaping, and wetland restoration Attracts hummingbirds. Browsed by wildlife. 1,008,000 to 1,550,000 seeds per pound. "Uncommon in slough marshes, bogs, and other wet places; sometimes in thickets. Coon Creek bottom, the Searle tract, and a low place on the C. & N.W. Ry. east of Winnebago." (Fell 1955)

Chelone obliqua *IA, MI PINK TURTLEHEAD (*obliquus -a -um* oblique, slanting, sideways, awry, lopsided.) Seasonally inundated, wet meadows, cold moist stratify or fall plant pink flowers 2.0-5.0'. Blooms 8,9. Seed matures fall. Wetland restoration, adventive in northeast Illinois, but at home in the wetlands of the Mississippi in Illinois.

DASISTOMA Rafinesque **Dasistoma, Mullien Foxglove** *Scrophulariaceae* Placed in the *Orobanchaceae* by some authors. From Greek words *dasys,* hairy or shaggy and *stoma*, a mouth. A monospecific genus, a hemi-parasitic herb, endemic to southeast North America. The genus name is also spelled *Dasystoma.* Formerly placed in *Seymeria.*

Dasistoma macrophylla (Nuttall) Rafinesque *MI, WI MULLEIN FOXGLOVE, aka Mullien Seymeria (*macrophyllus -a -um* with large leaves, having elongated leaves or leaflets, from Greek μακρος, *macros*, long; tall, high, deep, far, *-o-*, and φυλλον, *phyllon*, leaf, foliage, and *–us*, Latinizing suffix.)
Habitat: Mesic and dry savannas, recent clearings, rich woods, dry woods, rocky slopes, thickets. In the se USA xeric to dry mesic woodlands and bluffs, over limestone or diabase (Weakley 2007).
Culture: Light, fall plant in permanent location, parasitic on oaks? We have it flower under *Prunus serotina* at our farm.
Description: general form Native annual, (perennial?) partial parasite culms 3.0-5.0' leaves opposite; lower widely oval, deeply bi-pinnately cut; upper lance-like, getting smaller and becoming entire flowers yellow, 5-merous, 1/2" long, densely hairy inside, flaring lobes almost equal and widely spreading, tube longer than the lobes, 4 stamens; inflorescence an interrupted, leafy spike with flowers from the leaf axils fruit is a roundish capsule, with papery seeds.
Comments: Blooms 7-9. Native landscaping, dried arrangements. 648,000 seeds per pound. "Quite uncommon being known to us only on Kishwaukee River; in Mulford woods at Perryville road, on the river bank opposite Camp Rotary and in the forest preserve in De Kalb county on the south branch of the river." (Fell 1955)

MIMULUS Linnaeus **Mimulus** *Scrophulariaceae* Some authors place this genus in *Phrymaceae* Schauer 1847, the Lopseed family. *Mimulus* New Latin, from Late Latin, comic actor, from diminutive of Latin *mimus* mime, mimic, and *-ulus,* diminutive, from Greek *mimos*, imitator; probably from the flower bud mimicking a mask or monkey's face; New Latin, from Latin *mimus* mime, from Greek *mimos*; because the flowers are supposedly mimicking to grinning faces by extension, a monkey or an ape. About 150 species of American perennial herbs and shrubs having a tubular 5-angled calyx and an irregular 2-lipped corolla. The greatest diversity is in western North America.

Seeds ripen mid- to late summer. Seeds germinate very easily. Code A, H. Cuttings and layerings are possible. (Cullina)

Mimulus ringens Linnaeus MONKEY FLOWER aka Allegheny Monkey Flower, Square Stemmed Monkeyflower (*ringens* gaping, referring to a hole, open-mouthed, wide open, as in some labiate flowers, from Latin *ringens*, from *ringor -i*, to open the mouth wide, or rarely to show the teeth, to snarl, be angry, for the gapping corolla.)
Habitat: Seasonally inundated areas. Wet meadows, upland swamp, and shorelines.

Culture: "Cold moist treatment, or fall sow. Very light to no cover. Good germination." (Dunham 1993) 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Light, GA3 helps, fall plant. Stem cuttings.
Description: Pale purple to light blue flowers on long peduncles. 1.0-3.0'. Short rhizomes.
Comments: Blooms 7,8,9. Landscaping. 22,900,000 to 53,411,760 seeds per pound. "Our only species. Common in wet places." (Fell 1955)

PEDICULARIS Linnaeus *Scrophulariaceae* Placed by some authors in the *Orobanchaceae. Pedicularis* New Latin, from Latin *(herba) pedicularis* lousewort, literally of or pertaining to the little feet, - *pediculus* from *pedis, pedis* a louse*,* a name used for a plant in Columella thought to be associated with lice plus -ulus, a diminutive suffix, and -*aris*, from -*alis*, of or pertaining to; Latin meaning lousewort, in reference to the old English belief that when cattle or sheep grazed on these plants, they became infested with lice; alternately from the plants ability to repel lice from livestock, or from the belief the plant bred lice, also the leaves appearing to be infested with lice. Genus is well known for facultative, hemi-parasites. About 350 (500) species of hemiparasitic herbs from temperate regions of central and eastern Asia, Europe, western North America, eastern North America, and Andean South America. About 65 species in North America. Haustorial connections are produced upon contact with roots of surrounding host plants. It is said there is no known host specificity. Partial parasites-cold moist stratify(30) / fall plant-successional restoration

Pedicularis canadensis Linnaeus WOOD BETONY, aka Canadian Lousewort, Common Lousewort, Early Lousewort, Eastern Lousewort, Forest Lousewort, Lousewort, Prairie Betony (*canadensis -is -e* of or from Canada or the north-east USA, of Canadian origin.)
Habitat: Hill, sand, dry, and mesic prairies-mesic and dry savanna. Said to prefer slightly acidic soils,
Culture: Difficult from seed and transplants (not possible?). 30 days cold moist stratification. Parasitic species which needs a host plant (pm 09). Some suggest division of established plants in spring.
Description: Erect perennial, 0.75-1.25', yellow flowers pollinated by bees, interesting fern-like foliage.
Comments: Blooms 4-6. Hemi-parasitic generalist, attacks a wide range of species, including other hemiparasites and members of its own species, when seedlings are grown close together. It does not attack all species it encounters, nor does it parasitize all hosts equally. It is said to be capable of normal growth and development without a suitable host plant. Individual plants may not be long-lived (4-5 years), and may loose vigor in the center, forming fairy rings (Henderson 2002). Plants may form small clones by means of short stoloniferous stems (Piehl 1963), or colonies may spread by self sown seed (Henderson 2002). Piehl (1963) described the *Pedicularis* haustoria as nearly globose to broadly elliptic structures and noticed the presence of haustoria produced close together in a bead-like arrangement.

Henderson (2002) feels that *P. canadensis* is a "keystone species" and the parasitism of the species reduces the dominance of C4 grasses and allows greater diversity in native plantings. Henderson's observations were from species diversity patterns in remnant prairies and a successionally seeded planting, not from *de novo* restorations. In Henderson's experiment, grasses within reach of the wood betony had their flowering reduced by 90%, culm density reduced by 60%, and leaf height reduced by 50%.

Used for cut flowers, attractive dried seed heads. Ethnobotanical uses, rock gardens, attracts hummingbirds. 528,000 to 633,636 seeds per pound. Fruit is a capsule with tiny seeds. The seeds are said to resemble lice, and the scalloped leaves have the appearance of being infested with lice.

"Common in two quite different situations, dry wooded streambanks and in boggy places and low prairies in Coon Creek bottom. Kishwaukee River bank at Camp Hillcrest, and the high bank of South Kinnikinnick Creek. We have not seen var. *dobbsii* Fern." (Fell 1955)

Pedicularis lanceolata Michaux SWAMP BETONY, aka Fen Betony, Swamp Lousewort (*lanceolatus -a -um* lanceolate, spear-shaped, lancelet-like in form, New Latin from *lancea,* lance or spear, -*ola-, -olus-,* diminutive, and -*atus*, possessive or likeness, for the lanceolate leaves.)
Habitat: Fens, wet meadows, upland swamps.
Culture: 30 days cold moist stratification. Parasitic species which needs a host plant. (pm 09) From seed in mature wetland restorations by successional method.
Description/comments: Erect perennial, 1.0-2.0', yellow flowers. Blooms 8,9 Cut flowers, attractive dried seed heads, landscaping, wetland restoration. Calcareous soils. 520,000 to 813,620 seeds per pound. "Frequent in boggy places and sloughs. Coon Creek bottom, Kent Creek bottom at North Springfield avenue road." (Fell 1955)

PENSTEMON Mitchell 1769 **Beard-tongue, Penstemon** *Scrophulariaceae* Placed by some authors in the *Plantaginaceae. Penstemon* from Greek *pente, penta,* five and *stēmōn*, warp, thread, or a stamen, for the 5 stamens, or a reference to the fifth stamen, the staminode. A genus of about 250 species of perennial herbs and shrubs, of western North America, eastern north America, and one species in Asia. Fruit is a capsule with tiny seeds. Most species readily self-sow. Cut flowers, dried seed heads, landscaping. Attracts hummingbirds
Culture: "Cold moist treatment, or fall sow. Germinates better on cooler soils. Sow early spring or late fall. light cover, very good germination." (Dunham 1993)

Seeds mature midsummer to fall. Easy from cold moist stratified seed with shallow sand cover (light). The genus is notoriously polygamous, with hybrids common. Easy in containers. Code B, H. 2-4 node soft or semi-hard wood cuttings (not hollow) root easily. (Cullina 2000)

Penstemon calycosus Small *Mi CALICO BEARDTONGUE, aka Smooth Beardtongue *calycosus* remarkable calyx, with a large calyx, from Greek καλυξ, *calyx*, husk, covering calyx, and *–osus*, plentitude or notable development.)
Habitat: Woodland slopes with sparse vegetation, woodland edges, advancing woodland fringes, woods, meadows, and rocky slopes. In the se USA, limestone ledges, other woodlands (Weakley 2008).
Culture: 30 days cold moist stratification. Seeds germinate most successfully in cool soil. (pm 09) Cold moist stratify 30 days (Wade nd).
Description: Flowers tinged with purple and anthers glabrous, 5-merous. key features "Anthers are without hairs on the backs." (ilpin)
Comments: C3. 1,440,000 to 1,856,851 seeds per pound. "This resembles *P. digitalis* in looks and in its weedy nature. The flower is purplish and its calyx lobes ate attenuate. Uncommon in the low prairies in Coon Creek bottom east of Seward Bluff Forest Preserve." (Fell 1955)

Penstemon cobaea SHOWY BEARDTONGUE (*cobaea* New Latin, irregular from Bernabé *Cobo* died 1657, Spanish naturalist)
30 days cold moist stratification (pm 09). 192,000 to 1,075,200 seeds per pound.

Penstemon digitalis Nutt. Ex Sims FOXGLOVE BEARD TONGUE, aka False Foxglove, Tall Beard-tongue, Tall White Beardtongue, Talus Slope Penstemon (*digitalis* Latin *digitalis*, pertaining to a finger, or digit, from Latin *digitus*, for the shape of the corolla.)
Habitat: Mesic and dry prairies, mesic savannas, and woods, ecologically tolerant species, sandy soils, mesophytic woods, mesic sand prairie, disturbed sand ground. Woodland borders, meadows and sparsely vegetated wooded slopes. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance high. Fertility requirement medium. Salinity tolerance medium. Shade tolerant. pH 5.5-7.0.
Culture: 30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil (pm 09). "30 days moist stratification required for germination. Field sow fall." (pn nd) Light, dry storage (180), cuttings, easy from seed or transplants. Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.
Description: Erect perennial, 2.0-4.0', white flowers pollinated by bees (and anthers with stiff hairs on back) 5-merous key features "Stems are typically glabrous, often glaucous or purplish; corolla is usually marked with purple lines within." (ilpin)
Comments: Blooms 5-7. C3. This may be early successional and short lived in plantings. 1,600,000 to 2,080,000 seeds per pound. "Rather frequent on low prairies in Grove Creek bottom, the Searle Tract and in a thicket in Coon Creek bottom, in Rockton Township." (Fell 1955)

Penstemon gracilis SLENDER PENSTEMON (*gracilis -ie -e* slender, gracefully slight in form.)
"30 days moist stratification required for germination. Field sow fall." (pn nd) C3. 3,200,000 to 9,600,000 seeds per pound.

Penstemon grandiflorus *IL LARGE-FLOWERED BEARD TONGUE, aka Large Beard Tongue, Shell Leaf Penstemon (*grandiflorus -a -um* large-flowered, with flowers larger than normal, New Latin, from *grandis,* full-grown, great, large, tall, *-i-,* and *floreo*, to bloom, to flower.)
Habitat: Open sand prairies Sandy woodlands or plains. Moderate water requirements. Full sun to part shade. Likes well drained soils performing best in sandy soils. Moderately coarse to moderately fine soils. Neutral soils.
Culture: 30 days cold moist stratification. Seeds germinate most successfully in cool soil. (pm 09) "30 days moist stratification required for germination. Field sow fall." (pn nd) Dry storage 70 (180). Plant 4.5 oz per 1,000 ft. sq. (Stocks). Pure stand plant 5 lb per acre. (Granite). Sow in fall or cold stratify (pots 2000).
Description: Native erect perennial, 2.0-4.0', with spectacular, showy, short-lived, lavender to pink tubular flowers, occasionally white. Prominent opposite, gray-green, fleshy leaves with a waxy surface.
Comments: Blooms 5,6. C3. Very showy in large colonies, flowers are followed by attractive dried seed heads. 224,000 to 292,055 seeds per pound. This species forms buds above ground, which are harmed by prairie fires. In its habitat, fuel densities are often too low to carry a heavy fire. Abundantly self sows in open, sandy ground.

Penstemon hirsutus (Linnaeus) Willdenow HAIRY BEARD TONGUE, aka, Northeastern Beardtongue (*hirsutus -a -um* hirsute, hairy, covered with hair, with straight hairs, having long distinct hairs, rough, stiffly hairy. From Latin for rough, shaggy, bristly, prickly, hirsute, or rude, unpolished.)
Habitat: Hill, dry, and sand prairies, dry savanna, gravelly prairies. Thin shallow soils over dolomite, dry wooded slopes

Culture: Cold moist stratify 30 days, cool soils. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Seeds germinate most successfully in cool soil (pm 09).
Description: key features Stems with glandular hairs; lower lip of flower nearly closing off the throat. C3. 2,000,000 to 5,604,938 seeds per pound. "Not as common as *P. pallidus*. Gravel hills south of Roscoe and west of Rockton; the high bluff of Killbuck Creek in the Forest preserve. Usually plentiful when found." (Fell 1955)

Penstemon pallidus Small PALE BEARD TONGUE, aka Eastern White Beard-tongue (*pallidus -a -um* pale, wane, pallid, somewhat pallid, somewhat pale, causing paleness, from Latin *pallidus*, from *pallere* to be pale, from Greek *polios* gray.)
Habitat: Hill, dry, and sand prairies, dry sandy savannas, limestone barrens.
60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09).
Description/comments: White flowers key features Stems with short hairs; throat of corolla flattened. Pollinated by bees, needs sharp drainage 0.75-1.25' Blooms 5,6. C3. 2,759,878 to 3,200,000 seeds per pound. "Common on prairies, railroads and in sandy places. C. & N.W. Ry. east of Rockford and Sandy Hollow road south of Rockford." (Fell 1955)

Penstemon tenuiflorus EASTERN WHITE BEARDTONGUE (*tenuiflorus-a -um* with slender flowers, from Latin *tenuis*, thin, slender, or narrow, and *flos*, flower.)
30 days cold moist stratification (pm 09).

Penstemon tubaeflorus TUBE BEARDTONGUE (*tubaeflorus* with trumpet-like flowers.)
30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)

SCROPHULARIA Linnaeus **Figwort** *Scrophulariacea Scrophularia* New Latin, from Medieval Latin *scrōfula, scrōfulae* and New Latin *-aria*; from the supposed efficacy of such plants in the treatment of scrofula. Scrofula is tuberculosis of lymph glands, especially those of the neck [Medieval Latin, from Late Latin *scrofulae* (plural) swellings of the lymph glands of the neck, literally, little sows, plural of *scrofula*, diminutive of Latin *scrōfa* breeding sow. cf. Greek χοιράδες, *choirades,* plural of χοιράς, *choiras* like a hog's back.]. About 200 species of temperate and tropical areas of the east and west hemispheres.

Scrophularia lanceolata Pursh EARLY FIGWORT, aka Amercan Figwort (*lanceolatus -a -um* lanceolate, spear-shaped, lancelet-like in form, New Latin from *lancea,* lance or spear, *-ola-, -olus-,* diminutive, and *-atus*, possessive or likeness of, for the lanceolate leaves.)
60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate (pm 09). "Common on roadsides, in fencerows and the edge of woods." (Fell 1955)

Scrophularia marilandica Linnaeus LATE FIGWORT, aka Eastern Figwort
Habitat: Sand prairies, mesic, dry, and sand savannas.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Cold moist stratify or fall plant.
Description: 3.0-6.0'. Blooms 7,8,9. Attractive dried seed heads, landscaping 4,000,000 seeds per pound. "More common than the above and more likely to be in woods rather than in the open." (Fell 1955).

SEYMERIA Pursh **Blacksenna** *Scrophulariaceae* Placed in the *Orobanchaceae* by some authors. New Latin, from Henry *Seymer*, 19th century English naturalist and New Latin *–ia*. A genus of about 25 species of annual hemiparasitic herbs of southern North America. *Dasistoma macrophylla* was formerly in this genus.

VERONICASTRUM Heister ex Fabricius **Culver's-root** *Scrophulariaceae* tribe *Veronicaceae.* Sometimes placed in Family: *Plantaginaceae*. *Veronicastrum* somewhat resembling *Veronica*, New Latin after the genus *Veronica*, named for St. Veronica and *–aster*, *astrum,* denoting an incomplete resemblance or an inferior sort; meaning a plant somewhat like *Veronica* or an inferior sort of *Veronica.* Alternately from *Veronica-ad-instar.* Other times *-astrum* means a star. Tall herbs resembling speedwells. C3.

Veronicastrum virginicum (Linnaeus) Farw. *MA, NY, VT CULVER'S PHYSIC aka Blackroot, Beaumont Root, Bowman's Root, Bourman's Root, Culver's Root, Physic Root, Oxadaddy, Tall Speedwell, Tall Veronica (*virginicus -a -um* of or from Virginia, USA, Virginian.) The common name is said to be from a Dr. Coulvert, an American physician of the late 17th and early 18th centuries, or a colonial Dr. Culver.
Habitat: Wet, mesic, dry, and sand prairies, mesic and dry savanna woods and prairies, occasional to common through Illinois.
Culture: Seeds ripen late summer as the small woody capsules brown. Crush the capsules and clean with a fine screen.

3-4 weeks cold moist stratification improves germination. Seeds require light. Code B, H*. (Cullina 2000) The seeds are small and may be difficult to germinate. Division of mature clumps in spring. 2-3 node tip cuttings root well in spring. *Cullina (2000) notes the seeds are hydrophilic, so store in ziplocks*. Once established self-sows.

No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)

Description: Erect perennial, 2.0-6.0', white, rarely pink flowers.

Comments: Blooms 6,7,8. Cut flowers, attractive dried seed heads, ethnobotanical uses, landscaping. 11,493,670 to 16,509,090 seeds per pound. Fruits are capsules with tiny seeds. Weakley (2008) notes in the se USA, "Populations seem to be of somewhat sporadic or irregular appearance from year to year." "Common in wet places particularly low prairies." (Fell 1955)

Associates: Pollinated by bees and other Hymenoptera. Attracts butterflies, game birds, and ants.

WULFENIA [*Besseya* Rydb.] **Kittentail** *Scrophulariaceae* Named for Franz von *Wulfen* (1728-1805), Austrian botanist. Except for Swink and Wilhelm 1994, this is placed in the genus *Besseya*. Formerly *Synthris* Benth. (*besseya* after the botanist Bessy)

Wulfenia bullii (Eat.) Barnh. * IL, IN, IA, MI, MN, OH, WI [new nomenclature *Besseya bullii* (Eaton) Rydb.] KITTENTAILS, aka Besseya, Bull's Coraldrops, Kitten Tails, Kitten-tails, Northern Kittentail (*bullii* for George Bull, discoverer of the species.)

Habitat: Dry prairies, woods, and barrens. Sandy grasslands, prairies, open oak woods, savanna. In sandy or gravelly soils. In Michigan it is found exclusively in oak savannas on steep hillsides. distribution: Upper Midwest, uncommon throughout its range.

Culture: "Fall sow, or cold moist treatment 120 days. However, dry cold storage and shorter cold moist treatment have resulted in germination. Very light cover." (Dunham 1993) Best planted outdoors in the fall, or 120 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09)

Description: general form Small, erect perennial, 8" to 12 (16)", easily overlooked except when in bloom culms stems hairy leaves basal rosette of ground hugging, oval, toothed leaves, 2-5" in length, cauline leaves smaller, alternate, sessile or clasping flowers yellowish green, small, 5-merous, prominently 2 lipped, upper lip sharp, lower lip curved backwards with 3 irregular small lobes, 2 stamens; inflorescence a 2"-6", dense, spike-like raceme of stalked flowers. Flowering progresses from the bottom of the spike upwards key features Fruit is a hairy 1/8 to 1/4" 2-celled capsule.

Comments: Blooms 4-6. Kittentail is self-compatable (McKone etal 1995). This species is commonly threatened by habitat degradation and brush encroachment. Burn, baby, burn. It is best to seek this plant in late May to mid-June, when it is in bloom and most obvious. Some think it evokes the image of a tiny mullein plant. "Uncommon on high prairies particularly in the gravel hills, also in thin oak woods in sandy areas. (*Wulfenia bullii* (Eaton) Barnh.)" (Fell 1955 as *S. bullii* (Eaton) Hell.)

Associates: Pollinated by small bees of the family Halictidae *Lasioglossum anomalus, Augochlorella striata* and *Dialictus spp.*

SOLANACEAE A. L. de Jussieu 1789 **Nightshade Family**

NICOTIANA Linnaeus **Tobacco** *Solanaceae Nicotiana* After Jean *Nicot,* 1530-1600, French ambassador in Portugal who introduced the plant to France. ≈ 70 (67) species, herbs to small trees, New World, but 20 in Australia and 1 in SW Africa, and the South Pacific. Typically white or yellow fragrant showy trumpet shaped flowers and bold foliage. For the border, indoor or patio. Many are smoked, some grown for insecticide, nicotine, organic, biodegradable, but deadly. Sow indoors 30 to 60 days before last frost, or outdoors after danger of frost is past. Surface sow germ in 1 - 3 weeks. Seed long lived, half-life 5-10 years. "Rank, acrid-narcotic American herbs" (Fernald 1950 in Weakley 2008).

Nicotiana rustica Linnaeus INDIAN or WILD TOBACCO *Nilu-Famu* (Shawnee) formerly found in disturbed areas around American Indian habitations throughout eastern North America. Cultivated for centuries in Midwest. Originally native to Peru. This was the first tobacco taken to and cultivated in Europe.

Culture: No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) No treatmen, light.

Description: Erect annual, 1.0-3.0', yellow inch long flowers, with oval foot long sticky (dewy JLH) leaves. Blooms 7,8,9,10. Half-hardy annual, occasionally short-lived perennial. Commercially, it is the source of a deadly insecticide. Much more potent than *N. Tabacum*. Formerly used as an arrow poison in Mexico, currently used as an immobilizing drug in the capture of wild animals. Excellent (but toxic) home insecticide. Good example of an "organic" but deadly product. 2,080,000 seeds per pound.

SPARGANIACEAE Bur Reed Family

SPARGANIUM Linnaeus 1753 **Bur-reed** *Sparganiaceae,* sometimes placed in the *Typhaceae* New Latin, from Latin *sparganion* bur reed, from Greek, diminutive of *sparganon* swaddling band. A genus of about 14 species comprising the family *Sparganiaceae*, marsh or aquatic herbs of temperate regions with simple or branching stems, linear leaves, and monoecious flowers in globose heads.

Sparganium americanum Nutt. *IL AMERICAN BUR REED
Habitat: Marsh, fens, ditches. Muddy shores and shallow water, swamps. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance none. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 4.9-7.3.
Culture: Growth rate moderate. Seedling vigor high. Vegetative spread rate rapid.
Description/comments: Colonizing, erect emergent perennial, 3.2', 8" minimum root depth. Endangered species in Illinois. Blooms May – July. Provides food for waterfowl, muskrats, and beavers. 15,600 to 78,669 seeds per pound.

Sparganium eurycarpum Engelm. (or Engelm. ex Gray) *KY, NH COMMON BUR REED, aka Broadfruit Bur-Reed, Giant Bur-reed, Large Bur-Reed (*eurycarpum* from Greek εὐρύς, *eurys*, wide, and καρπος, *karpos*, fruit.)
Habitat: Shallow water, seasonally inundated, muddy ditches, upland swamps. Established plants prefer 12" water in shallow marshes (range 24" to 2"). Nutrient load tolerance low to moderate. Siltation tolerance low to moderate. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement low. Salinity tolerance none, or low to moderate. Shade tolerance intermediate. pH 5.0-8.0 (usda), or 6.7 to 8.8. Partial to full sun. "Common in swamps and along borders of sloughs and streams." (Fell 1955)
Culture: Prolonged dormancy and low germination rates. Dry seed is quite buoyant and will strand on shoreline. One method is soak seed in bucket of water outside all fall, winter, let freeze, and in the spring sow in saturated soils. Some say scarify and store in 36º-37°F water for as least one year (USDA 1997). Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Further germination pretreatments not sure? (pm 09) In mixes plant 0.2 to 1.0 pls lbs per acre. Growth rate moderate. Seedling vigor high. Vegetative spread rate rapid. Seed availability may fluctuate widely during years with persistent high waterlevels in natural wetlands.

Seed, bare root plants, chunks of rhizomes, and potted plants available. Plant availability may be limited at times due to incredible demand. Bare root material is more successful in spring, but it is only marginally successful at best. Plant rhizomes in mud in up to 2" of water in spring. Those few that grow will spread rapidly. Use 2-6' centers for plugs. Seed-grown or cloned plugs grow best, but availability may be limited by mid-summer.
Description: Perennial emergent herb, or perennial aquatic, or an emergent aquatic, 4.5-5.0', 1.5-4.0', 12' minimum root depth, globular white flowers, followed by round seed heads.

"Flowers are in globose heads. Species has persistent creeping rhizomes and stiff erect leaves." (ilpin)
Comments: Blooms 6-8. C3. Wetland restoration, lower shoreline zone for erosion control. Spreading rhizomatous root system buffers wave action on lake and pond margins. 8,000 to 13,046 seeds per pound.
Associates: Provides food and cover for many types of wildlife. Waterfowl, marshbirds, shorebirds, songbirds, pheasant, and beaver eat seeds Leafy growth is good cover for nesting marshbirds, waterfowl and muskrats. Aquatic furbearers (esp. muskrats) use cover and eat stems and foliage. Roots (or tubers, they are actually rhizomes) eaten by ducks.

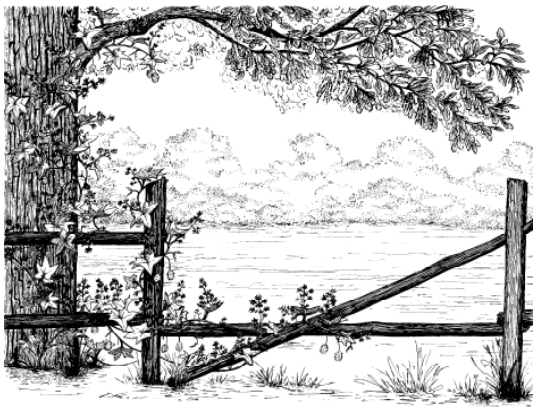
TYPHACEAE A.L. de Jussieu 1789 Cattail Family

TYPHA Linnaeus 1753 **Cattails, "Bulrush", Small Bulrush, Reed-Mace, Reed-Maize (**a corruption of the previous?) *Typhaceae* New Latin, from Greek *typhe* cattail, plant used as stuffing for beds, Old Norse *thufa* mound, Old English *thuf* tuft, crest, Latin *tumere* to swell. Tall erect herbs occuring in fresh and salt marshes and have sword-shaped leaves and monoecious flowers in dense spikes with the staminate uppermost.

Typha angustifolia Linnaeus NARROW-LEAVED CATTAIL (*angustifolia*, narrow-leaved)
Habitat: Along expressways, marshes, and is tolerant of alkaline and saline soils. Wet meadows, marshes, shores, and ditches, at times in calcareous or brackish habitats. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance medium. Shade intolerant, full sun. pH 3.7-8.5.
Culture: Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid.
Description/comments: Rhizomatous, 4.0-9.0'. 10" minimum root depth. Blooms June – July. Provides food for geese, muskrats, beavers, and cover for nesting ducks and spawning fish. 6,000,000 to 14,000,000 seeds per pound. "While there is no question that this species is far more widespread locally than it was at the turn of the century, we are retaining it as a native to the general region until firmer data are presented." (Swink & Wilhelm 1994)

"Found only in an abandoned gravel pit southeast of Rockford. Both the species of Typha grew in this pond and many of the plants showed a mixture of the characteristics of the two species suggesting hybridization. This station is now destroyed. Known in Boone County." (Fell 1955)

Typha latifolia Linnaeus BROAD-LEAVED CAT-TAIL, aka Cattail, Common Cattail, Reed-Mace (*latifolia*, broad-leaved)
Habitat: Seasonally inundated, wet meadows, marshes or shallow water, low areas. Marshy, muddy, or sandy spots with water up to 1.5' deep. Degraded swamps, marshes, wet shores and ditches. Occurs in dense clusters in and around aquatic areas. Moderately coarse to fine soils. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance low. Shade tolerance intermediate. pH 5.5-7.5, neutral to basic or acidic soils. "Common in wet places." (Fell 1955)
Culture: Cold moist stratify, light, hot soils, saturated soils. Plant roots in spring 1000/acre. Plant 1/2 lb pls per acre in fall, spring, or summer (Granite). Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid.
Description: Aggressive rhizomatous, sod forming, perennial aquatic 3.0-10', typically 5'. 14" minimum root depth.
Comments: Generally considered invasive. Blooms 6,7. Ethnobotanical uses, wetland restoration, cool season, very aggressive. Provides food for geese, muskrats, beavers, and cover for nesting ducks and spawning fish. Excellent cover for wildlife. Waterfowl eat rootstocks and seeds, use cover. Marsh birds and shorebirds eat seeds. Aquatic furbearers (esp. muskrats) use cover, eat leaves and rootstocks, and use plant for nesting material. 6,000,000 to 14,000,000 seeds per pound.



UMBELLIFERAE A.L. de Jussieu 1789 or *Apiaceae* Lindley 1836, or *Actinotaceae* A. I. Konstant. & Melikyan, or *Ammiaceae* Bercht. & J. Presl, or *Angelicaceae* Martinov, or *Daucaceae* Martinov, or *Ferulaceae* Sacc., or *Saniculaceae* Bercht. & J. Presl, or *Umbelliferae* Juss., nom. cons.

The *Apiaceae* are cosmopolitan, but mostly north temperate herbs, rarely shrubs or trees, almost always with umbellate inflorescences, comprising about 300 (250-440) genera and 3,000 (3300-3700) species usually with hollow stems and sheathing petioles. Each seed (mericarp) has 5 primary ribs. Generally aromatic plants, with hollow, furrowed stems. The leaves are compound or feathery with the leaf stalk sheathing the stem. The flowers are 5-merous, typically white (whitish-green) or yellow, and mostly in compound umbels.

Eating the roots of wild *Umbelliferae* can be very tasty or very deadly. Few groups of plants have as many culinary, edible and poisonous species as the carrot family.

ANGELICA Linnaeus **Angelica, Wild Celery** *Umbelliferae* From the Medieval Latin *herba angelica* "angelic herb" for the 'angelic' medicinal properties of *A. archangelica.* Feminine of Late Latin *angelicus*, angelic, from the legend that the medicinal properties of the plant were revealed to a monk by an angel who told him it was a cure for the plague. A*ngelic*, possibly for the cordial and medicinal properties of the genus. Fernald's use of "cordial" could be interpreted as a stimulant or as a liqueur. Genus of about 110 species of herbs found in the temperate zone of the Northern Hemisphere and New Zealand and having decompound leaves, mostly white flowers, and prominently dorsal-ribbed fruit. All members of this genus contain furocoumarins, which increase skin sensitivity to sunlight and may cause dermatitis.

Angelica atropurpurea Linnaeus * IA?, MD, RH, TN ANGELICA, aka American Angelica, Great or Large Angelica, Alexanders, Masterwort, Purple Angelica, Purple-stem Angelica (*atropurpureus*, blackish purple, from *ex atro purpureus* (purple tinged with black)
Habitat: Fens and seeps, wet meadows, calcareous moist woodlands and marshes. "Common in wet places." (Fell 1955)

Grows best where there is constant, calcareous groundwater. distribution Possibly introduced into SE USA.
Culture: Fresh seed or cold moist stratify shortly after ripening. Light "30 days moist stratification necessary. Field sow fall." (pn nd) Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination (pm 09). Seed is best sown shortly after ripening, as it is short-lived (A. Huxley 1992).
Description: culms 5.0-8.0' leaves pinnately divided, large but getting diminishing upwards, on a clasping, 2"-4" stalk flowers white to green 5-merous, inflorescence 4-9" ball-like compound umbel flowers lacking sepals, fruit a dry schizocarp splitting into 2 seeds key features Purple or purple stained glabrous stems; very large umbels.
Comments: Blooms 5,6. C3. Ethnobotanical uses landscaping, wetland restoration. Attracts upland game birds and songbirds. aggressive, calcareous soils. 87,291 to 105,600 seeds per pound.

CICUTA Linnaeus **Water Hemlock** *Umbelliferae* From the Latin name for poison hemlock. 8 species north temperate.

Cicuta maculata Linnaeus # NV ☠ WATER HEMLOCK, aka Common Water-hemlock, Musquash Root, Poison Hemlock, Poison Parsnip, Spotted Cowbane, Spotted Parsley, Spotted Water-hemlock (*maculatus -a -um* spotted, stained, blotched, blotchy, mottled, New Latin from *macula,* a spot, mark, stain)
Habitat: Seasonally inundated, wet meadows, wet savannas, and upland swamps. "Much more common than the preceding (*C. bulbifera*) being found in most sloughs and boggy places." (Fell 1955)
Culture: "Sow in flats in fall and over winter, or fall sow. If not possible then moist cold treat 120 days. Light cover." (Dunham 1993) 120 days cold moist stratification. Best planted outdoors in the fall. (pm 09) Sow seeds outdoors in fall, or 120 days cold moist stratification (Heon et al. 1999). Fall plant / moist cold stratify(120).
Description: general form Perennial or biennial, semi aquatic, emergent-wet meadow forb, the plant has a pleasant licorice or anise scent, but be cautious handling the plant roots tuberous base and sweet-smelling fleshy roots culms 2.0-7.0', often branched, stout, hollow, partitioned inside, purple spotted leaves alternate, 2-3 pinnate, lower leaves long petiolate, to +60 cm, upper leaves with shorter petioles, petioles with involute margin, leaf divisions purple at axils, ultimate leaflets serrate, (the teeth mucronate), lanceolate, glabrous flowers white, 5-merous, inflorescence 3" flat-topped compound umbel, fruit rounded, slightly ribbed schizocarp, splitting into 2 seeds key features Lower part of the stem is often mottled purple (ilpin). Its habitat, its glabrous and glaucous stems (which are purplish at the nodes), and its 2-3-pinnately divided leaves. A distinguishing characteristic is that the veins in the leaf run to the notches between the teeth.
Comments: This species is considered weedy or invasive by some authorities. Its weediness may have economic impact in some areas. Blooms 6,7,8. C3. Ethnobotanical uses. **This is the most poisonous native plant in eastern North America!!!!** All plant parts are considered poisonous to people. Symptoms of poisoning include muscle twitch, rapid pulse, rapid breathing, tremors, convulsions, excessive salivation or frothing at the mouth and dilation of the pupils, blurred vision. 192,000 seeds per pound. This species may vegetatively reproduce in part by its tuberous roots.
Associates: Deadly to cattle.

CONIUM Linnaeus **Poison Hemlock** *Umbelliferae* From ancient Greek name *coneion* for hemlock. A genus of 6 species in north temperate regions and south Africa. Tea anyone? A Socrates Special perhaps, with lemon?

Conium maculatum Linnaeus # CO, ID, IA, NV, NM, OH, OR, WA ☠ POISON HEMLOCK, aka *Cigue Maculee, Cigue Tachetee*, Deadly Hemlock, Poison Parsley
Habitat: Disturbed sites. distribution: Ubiquitous.
Culture: Why?
Description: general form Erect biennial, to 8' or more tall forb roots solid, thick, white taproot culms stems freely branched, green with purple spots leaves 3-4 times pinnately divided, 8"-16" broadly triangular to ovate in outline, toothed flowers white 5-merous, inflorescence is composed of many 2" to 3" mostly terminal umbels, often 2-4 together from the top stem node; center, tallest one blooms first but, in time, the side ones become taller, fruit is a schizocarp that splits in 2 when ripe key features stems green with purple spots.
Comments: Noxious weed in many states. It is considered weedy and invasive by many authors.
Associates: Poisonous to cattle, swine, poultry, horses, goats, and sheep, and Greek philosophers.

CRYPTOTAENIA Augustin de Candolle **Honewort** *Umbelliferae* From Greek *cryptos,* hidden and *tainia*, a fillet, referring to concealed oil-tubes. A fillet in this sense is a narrow strip of material, like a ribbon, not a chunk of meat. 6 species, north temperate and montane Africa.

Cryptotaenia canadensis (Linnaeus) Augustin de Candolle * FL, ME, RI HONEWORT, aka White Chervil, Wild Chervil (of Canada or northeast USA.)
Habitat: Dry woods, shade. Rocky woods, low ground. "Common in woods and moist thickets." (Fell 1955) In the SE, moist and nutrient rich forests, alluvial. bottomland, slope and cove forests (Weakley 2007). distribution:
Culture: 60 days cold moist stratification (pm 09). Growth rate . Seedling vigor . Vegetative spread rate .
Description: general form A perennial herb with thin three-foliolate leaves and small white flowers roots fibrous culms 1-3', branched, smooth leaves alternate, 3-parted with sharp, irregular teeth, doubly serrate, sometimes lobed; lower on long stalks flowers white, 5-merous, inflorescence a loose, 2" irregular, compound umbel with few flowered umbellets, on stalks of uneven length, individual flowers 1/8", lacking sepals, fruit is a dry, black schizocarp splitting into 2 seeds key features "1) It has hairless leaves and stems, 2) it has trifoliate leaves which are sometimes cleft, 3) its leaflets are lanceolate to ovate, rather than narrowly linear, 4) its umbels of white flowers are compound, rather than simple, and 5) it has no significant bracts at the base of each umbel or umbellet. If this isn't sufficient to produce an identification (this is a difficult group of plants), then consider the following two characteristics of the leaflets: Theirs margin are usually doubly serrate, and the base of each leaflet tapers to a winged petiole (sometimes it is quite short)." (http://www.illinoiswildflowers.info/woodland/plants/honewort)
Comments: Blooms 6-7. C3. 112,000 seeds per pound. May become a weed in wildflower gardens.
Associates: Pollinated by small bees, wasps, flies, and beetles, including the parasitoid Ichneumonid wasps and Wild Carrot wasps (*Gasteruptiidae*). Larval host of *Papilio polyxenes asterias*, Black Swallowtail butterfly. Deer occasionally browse on the foliage.

DAUCUS Linnaeus *Umbelliferae* New Latin, from Latin *daucus, daucum,* a kind of parsnip or wild carrot, from Greek *daukos, daukon,* or from Greek *daio*, I burn; perhaps akin to Greek *daiein* to ignite, burn; from the sharp taste or from the combustible sap some species exude; or a reference to the warming effect on the body from the plants medicinal use. Beware of flaming carrots, new meaning for a warm salad. (*That will learn you not to smoke at the dinner table.)* Chiefly temperate and tropical Old World herbs, ca. 22 species, that have compound umbels of mostly white flowers and prickly fruit.

Daucus carota Linnaeus QUEEN ANNE'S LACE aka Bee's Nest, Bird's Nest, Devil's Plague, Lace Flower, Rantipole, Wild Carrot (From the Latin for carrot, from the Greek name *karoton,* or from Celtic of red color.) The common name is from Queen Anne, wife of King James I of England. Devil's plague was a common name given by farmers who found this weed difficult to control. Rantipole, used in south England, means rude, rakish, and reckless.
Habitat: Persists in oldfields in poor soils and in low diversity restorations. Common on roadsides. distribution:
Native of Europe. Ubiquitous, but not in Alaska, Hawaii, or the Virgin Islands.
Description: Biennial. Umbels of white flowers with a single black or purple flower in the center. To 4' tall. Dissected fern-like leaves.
Comments: Noxious weed in many states. This is considered an invasive plant in most of the United States. Blooms 5-9. The sap in the leaves may irritate some peoples skin. "A common weed which resembles caraway but is taller and blooms later." (Fell 1955)
Associates: Minor food value to small mammals and upland birds. Seeds attach to clothing and fur.

ERYNGIUM Linnaeus 1753 **Eryngo** *Umbelliferae* New Latin, from Latin *ēryngion, eryggion,* a name for *E. campestre* eryngo, from Greek *eryngion,* ἠρύγγιον, a bristly plant, diminutive of ἤρυγγος, *eryngos,* in reference to the apparent prickle-like leaves, which are not very bristly or prickly, from the Indo-European root **ue(s)r*, spring. The Greek root is from an ancient epichoric dialect, Attic Greek, a variation of and closely related to *aruncos*, Doric Greek, the source of the genus name *Aruncus*, the beard of the goat. Coarse bristly perennial herbs 250 species of tropical and temperate regions, having elongate spinulose-margined leaves and flowers in dense bracted heads. Ours has the leaves of a yucca, the heads of a thistle, but is a carrot.

Eryngium yuccifolium Michaux *MD, MI, OH RATTLESNAKE MASTER, aka Button Eryngio, Button Snakeroot, Northern Rattlesnake Master, Tall Rattlesnake Master (*yuccifolius -a -um* yucca-like leaves, from *yucca,* Arawak name for *Manihot esculenta* of which the genus *Yucca* was mistaken for, *-i-*, and *folium*, leaf.)
Habitat: Wet mesic to mesic and dry prairies, open woods. Wet mesic to dry mesic, full sun. "Common in wet prairies and boggy places, also on prairies that are less moist." (Fell 1955) pH 5.0-7.5.
Culture: 60 days cold moist stratification (pm 09). "Moist cold treatment, or fall sow. Light cover. Very good germination. May self sow. (Dunham 1993)". Sow seeds outdoors in fall, or 90 days cold moist stratification (Heon et al. 1999). "90 days moist stratification required for germination. Field sow fall." (pn nd). 60 days stratification (Shirley 1994). Code B (Cullina 2000). Moist cold stratify or fall plant, cool soils, successional restoration method. Temperature sensitive. Best from transplants, but easy from fall seed. There may be germination inhibitors in the husk. Division of mature plants in spring.

Seeded alone 10 lb per acre or 4 oz per 1000. (Shirley 1994). In seed mixes use 0.125 pounds per acre or more, preferably only in fall plantings.
Description: roots small close bundle culms 2.0-6.0' leaves bluish-green yucca-like parallel veined, clasping the stem, with a sharp point and widely spaced weak prickles on the edges, basal leaves may be up to 3' flowers spherical white to lilac or purple, 5-merous, 0.5-1.0", flower color may vary on the same plant from year to year, inflorescence is a cyme of 0.25-1.0" spiny, round balls of tiny flowers on stout peduncles, fruit is a dry schizocarp splitting into 2 seeds.
Comments: Blooms 7,8,9. Flower heads are said to have a honey-like odor when in bloom. Seeds mature late summer. Excellent attractive dried seed heads. Useful in landscaping, interesting in formal beds. Useful in roadside plantings, prairie restorations and landscaping, wildlife cover and wildflower gardens. Said to self-seed aggressively, but can be somewhat well behaved. Drought resistant, adaptable. Mashed root used by Creek Indians. 96,595 to 191,077 seeds per pound.
Associates: Attracts butterflies. Pollinated by bees. Seed heads are often parasitized.

HERACLEUM *Umbelliferae Heracleum* after Hercules, from Greek Ἡράκλειος, *Herakleios*, *Hēraclēus, Hēraclīus, Herakles*, a reference to his great size and the size of some species. Biennial herb.

Heracleum maximum Bartr. COW PARSNIP, aka Masterwort, Beaver Root
Habitat: Wet meadows, wet and mesic savanna, rich or low ground and alluvial thickets.
Culture: "Fall sow direct or in containers and overwinter, or cold moist treatment. Light cover, biennial, may self sow". (Dunham 1993) Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside and allow 2 years for germination. Best planted outdoors in the fall (pm 09). Dry storage 70 (180)-fall plant or cold moist stratify.
Seed tests indicate viability drops quickly with dry storage in this species. Seeds should be treated as hydrophilic and stored accordingly.
Description: White flowers, 4.0-6.0'. Blooms 5,6,7. Ethnobotanical uses, wetland restoration. 41,600 to 68,549 seeds per pound.

OSMORHIZA Rafinesque **Sweetroot** *Umbelliferae* New Latin, from *osm-*, *osme*, an odor, and *–rhiza*, root, literally smelly or odorous root, referring to the fragrance of the crushed root. American (9+ species) and Asian white-flowered herbs with decompound leaves and fleshy aromatic roots. This genus is distinguished from other white-flowered wild carrots by the anise odor of the crushed foliage.

claytonii 4-7 flowers per umbellet; styles up to 1.5 mm (shorter than the petals); leaflets more deeply cleft than below.

longistylis (7)8-16 flowers per umbellet, styles at least 2.0 mm (as long or longer than the petals).

Osmorhiza claytonii (Michaux) C. B. Clark CLAYTON'S SWEETROOT, aka Bland Sweet Cicely, Hairy Sweet Cicely, Sweet Cicely, Sweet Jarvil, Wooly Sweet Cicely (after John Clayton, 1694-1773)
Habitat: Moist woods, woodlands, and forests, usually disturbed. Rich woods, ravines and valleys.
Culture: 60 days cold moist stratification (pm 09).
Description: general form erect perennial, odorless, stems and leaves covered with fine white hairs roots fibrous, may be weakly anise-scented culms 1-3' leaves toothed or lobed, 2 times pinnately divided; lower stalked, upper stalkless, margins dentate, crenate, lobed flowers white, 5-merous, lacking sepals, styles shorter than petals, inflorescence is a 3" compound umbel, with 3-6 stalked, few flowered umbellets terminal and axillary, individual flowers 1/8" across, fruit a dry schizocarp, splitting into 2 seeds, nearly straight and parallel key features Odorless (or nearly so), stem and leaves covered with fine, white hairs; styles shorter than the petals, becoming 1/16" long on the seeds; seeds nearly straight.
Comments: Blooms 4-6. C3. 40,000 to 46,112 seeds per pound. "Common in woods. The smaller of the two species and the more pubescent." (Fell 1955)
Associates: Seeds are dispersed by birds and mammals.

OXYPOLIS Rafinesque **Cowbane, Dropwort, Hog-fennel** *Umbelliferae* New Latin, from *oxy-*, *oxus*, sharp and *polios*, white from the sharp, awl-shaped secondary bracts and the white petals. Not as some say from Greek *polis* city. A genus about 7 species of marsh herbs of temperate North America having clustered fusiform tuberous roots and leaves only once-pinnate or reduced to slender petioles like rushes. Flowers are incomplete, lacking sepals.

Oxypolis rigidior (Linnaeus) Rafinesque *NY ☠ COWBANE, aka Common Water-dropwort, Stiff Cowbane
Habitat: Calcareous fens, moist to wet prairies, upland swamps, marshes, ditch banks. "In the boggy places in Sugar River sand areas, in sloughs, on low prairies and in prairie sloughs over the county." (Fell 1955)

Culture: "Fall sow or cold moist treatment 120 days. Lights cover fair germination. (Dunham 1993) Further germination pretreatments not sure? (Prairie Moon)? Fall plant or cold moist stratify. This species has limited commercial availability and may be seasonally available.
Description: general form Erect perennial culms 2.0-5.0', smooth, few branches, stems flattened leaves few, wide base clasping the stem; pinnately divided with 5-9 long and narrow, mostly stalkless leaflets flowers white, greenish tinge, 5-merous, inflorescences few, 3" - 6" stalked, compound umbels, each with 20+ spreading, loose, open umbellets, fruits dry schizocarp splitting in to 2 seeds, seed 2X wide as long, back very flat, with 5 rib-like ridges along each side.
Comments: Blooms 7-9. C3. 163,840 to 226,800 seeds per pound.
Associates: The roots and leaves are poisonous to humans and cows; contact may cause dermatitis.

PASTINACA Linnaeus *Umbelliferae Pastinaca* from Celsus, from the Latin name for parsnip and carrot, from *pastinum* a two-pronged dibble, or from *pastus*, food, alternately from Latin *pastino*, to prepare the ground for planting. A genus of about 14 species of biennial herbs of temperate Eurasia.

Pastinaca sativa Linnaeus # OH PARSNIP, aka Harts-eye, Madnip, Wild Parsnip, Yellow Parsnip (*sativus -a -um* Latin cultivated, sown, planted.) Native to Europe and Asia.
Habitat: Weed of open areas, disturbed sites, old fields, roadsides, pastures. Usually in rich, heavy soils. "A very common roadside weed." (Fell 1955)
Culture: ?
Description: general form Biennial, sometimes perennial, 1-5'tall, 1st year plant basal rosette roots white to yellowish, long taproot culms flat and ridged leaves alternate, pinnately compound, margins serrate, lobed; 5-11 oblong, ovate leaflets, resembling celery leaves. Do not handle them, but the leaves are said to have a parsnip-like taste and smell flowers yellow to white, 5–merous, 4-8" flat, compound umbel, with 15-25 umbellets, blooming from center outward, with the maturing side umbellets become taller than the central ones, lacking sepals, ruit dry schizocarp, splitting into 2 straw-colored seeds, seeds flattened on back, smooth, side ribs slightly winged.
Comments: This species is considered weedy or invasive in some areas. Blooms 5-10. C3. When working to eradicate this plant, wear protective clothing. Cut the root below the ground, and remove stems if seeds have formed. Late burning and herbiciding may help. Mow to break seed cycle.

Many people have an allergic reaction to this plant. It contains three furocoumarins (psoralen, xanthotoxin, and bergapten). These chemicals are phototoxic, and said to be mutagenic and photo-carcinogenic. Parsnip sap makes the skin photosensitive, causing second degree sunburns, followed by long lasting purple scars.

Beer can be made from the roots. Volunteer stewards, think about it! I'll wager the fermented roots can be distilled.
Associates: Parsnip is a larval plant food of the Common Swift, Garden Dart, and Ghost Moth. This plant is the garden parsnip gone wild. The cultivated plant is variety *hortensis* Ehrh., and the wild plant is variety *pratensis* Pers.

PERIDERIDIA Reichenbach **Yampah** *Umbelliferae* From *perideri, perideris,* Greek, a necklace. 13 species primarily of western North America.

Perideridia americana (Nuttall ex Augustin de Candolle) Reichenb. * IN, KY, OH, TN PERIDERIDIA, aka Eastern Eulophus, Eastern Yampah, Osage Perideridia, Thicket Parsley
Habitat: Mesic prairies, floodplains, savannas, thickets, and woods, " one of those members of a floristic diaspora, whose probable habitat was tall grass savanna on terraces of major streams." (Swink & Wilhelm 1994) Semishaded grassy areas, rocky woods, shaded thicket borders; Rarely in degraded prairies. Not uncommon in Box Pond Woods, Buda, growing with *Carex jamesii.* distribution: Occasional in the north ½ of the state, becoming rare in the south ½.
Culture: Seeds have morpho-physiological dormancy. Seeds should be cold stratified and will germinate at 25/15º C. Germination is equal in light and dark. (Baskin & Baskin 2001)
Description: Flowers white 5-merous.
Comments: Blooms 4-6. C3. Fruits (schizocarps) are small nutlets. 177,778 seeds per pound. "This prairie plant has a very limited distribution being confined mostly to the prairie peninsula. We have found it in low ground near Killbuck Forest Preserve and also on Ogle County a mile form our southern border. The tubers are fascicled." (Fell 1955)
Associates: Attracts butterflies, small mammals.

POLYTAENIA Augustin de Candolle **Prairie Parsley** *Umbelliferae* From the Greek *polys*, many, and *tainia* for fillet, a ribbon or headband, referring to many oil-tubes. *Taenia* is a component in the generic epithets of at least four (3) Midwestern Apiaceae. It does not refer to a chunk of meat.

Polytaenia nuttallii Augustin de Candolle *IN, MI, WI PRAIRIE PARSLEY, aka Nuttall's Prairie Parsley (for Thomas Nuttall 1786-1859)

Habitat: Hill, gravel, and dry and sand prairies, rocky woods. distribution: Throughout Illinois. "Very uncommon in our experience. A dry prairie situation on the C. & N.W. Ry. at Fannan's Crossing west of Rockford and a low prairie west of Yale bridge in Laona Township." (Fell 1955)
Culture: "Fall sow, or cold moist treat 120 days. Light cover. Fair germination." (Dunham, 1993). Best planted outdoors in the fall, or 120 days cold moist stratification (pm 09). Cold moist stratify (120) or fall plant
Description: general form Erect perennial culms 2.0-3.0' leaves lower long-stalked, oval shaped, pinnately divided; leaflets lobed, usually with a few sharp teeth flowers yellow, 5-merous, inflorescence compound domed umbel, 10-20 small umbellets with many flowers, fruit is a schizocarp splitting into 2 seeds, oblong, with flattened backs.
Comments: Blooms 5-6. Landscaping. Monocarpic. 41,600 seeds per pound. A bag of seed bears a striking resemblance to uncooked oatmeal.
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Coleoptera, Hemiptera.

SANICULA Linnaeus **Sanicle, Snakeroot** *Umbelliferae* New Latin, from Medieval Latin, *sanicle*, probably diminutive of Latin *sanus* healthy, or *sanare,* to heal, in reference to its reputed healing powers. A genus of chiefly American (*or nearly cosmopolitan)* herbs (22 to 40 species) having palmately compound leaves, unisexual flowers in panicled umbels, and fruit covered with hooked bristles. Inflorescence is pseudoracemose.

Sanicula canadensis Linnaeus *MA, VT CANADIAN BLACK SNAKEROOT, aka Sanicle, Black Snakeroot, Bur Snakeroot, Canadian Sanicle, *Sanicle du Canada variété du Canada*, Short-styled Snakeroot (of Canada or northeast USA.)
Habitat: Woods, floodplains, north facing bluffs (rhm02). "Not uncommon in woods." (Fell 1955) distribution: Occasional to common throughout Illinois.
Culture: Seeds have morpho-physiological dormancy and cold moist stratified seed germinate at 20/10ºC. germination was greater in dark than light. (Baskin and Baskin 2002)
Description: general form Biennial to 4.5' tall roots slender fibrous roots leaves 3-5 parted, palmately compound, trifoliate, margin doubly serrate, lobed, stalks becoming shorter near the top flowers white, 5-merous, sepals longer than the petals, inflorescence an irregular, compound umbel, 2-7 flowers per umbellet, female flowers stalks, fruit is a rounded schizocarp, splitting into 2 seeds, with stalked, hooked bristles.
Comments: Blooms 6-7. C3. 63,368 (gnis2009) seeds per pound. Can become a weed in wildflower gardens.

SIUM Linnaeus **Water Parsnip** *Umbelliferae* New Latin from *sion*, a Greek name of some marsh plant, possibly the water parsnip or marshwort. Genus of about 14 species of herbs of the Northern Hemisphere.

Sium suave Walter TALL WATER PARSNIP, aka Hemlock Waterparsnip, Water Parsnip (*suave* sweet, pleasant, agreeable, similar to Latin *suadis* pleasant, sweet, which evolved into Old English *swēte*, English sweet)
Habitat: Marshes and ditches, ponds, low woods, and swamps.
Culture: 60 days cold moist stratification (pm 09). Fall plant. This species is of limited commercial availability.
Description: general form Erect perennial (annual?) roots fibrous culms 2.0-6.0' (9), usually tall, branched, smooth, stems solitary, angular, stout leaves pinnately divided into 7-17 long, narrow, sharply-toothed leaflets. flowers white, 5-merous, compound umbel 2-3" across, sepals lacking, outer petals sometimes larger; inflorescence 1.5-4.5" compound umbel, with 6 or more compact umbellets, fruit schizocarp oval, splitting into 2 strongly ribbed seeds key features Corrugated stems (ilpin).
Comments: Blooms 7-9. C3. Wetland restoration. "Common in wet places. Marked variation in the leaf cutting is a characteristic." (Fell 1955)
. C3. Wetland restoration. "Common in wet places. Marked variation in the leaf cutting is a characteristic." (Fell 1955)

TAENIDIA (Torrey & A. Gray) Drude **Yellow Pimpernel** *Umbelliferae* New Latin, from Greek *tainidion* small ribbon or a small band, diminutive of *tainia,* Latin *taenia -ae* f. a fillet , headband, in reference to the ribs of the seeds. Herbaceous perennial. Monotypic genus of temperate eastern North America.

Taenidia integerrima (Linnaeus) Drude * CT, RI, VT YELLOW PIMPERNEL
Habitat: Prairies, dry, often rocky woods, mesic savanna, open woods and woodland edges. "Common on prairies especially low ones but also on roadsides and other drier places." (Fell 1955) In the SE USA, dry to dry-mesic forests and woodlands over mafic or calcareous rock (Weakley 2007). Occasional throughout Illinois.
Culture:. Best planted outdoors in the fall, or 60 days cold moist stratification (pm 09). Cold moist stratify (120) or fall plant.
Description: general form Erect perennial roots thickened tuberous roots culms 1-3', smooth, branched, with a celery odor leaves smooth edged, long-stalked, lower usually 3 times divided, upper with clasping stalks encircling the stem and 1-2 times divided flowers yellow, 5-merous, inflorescence terminal, loose, open compound umbel, 7-16

spreading stalks with umbellets, with the outer stalks longer, female flowers are at the outer edges of the umbellets key features Other similar native carrots have toothed edged leaves.
Comments: Blooms 5,6,7. Ethnobotanical uses. 96,000 to 146,336 seeds per pound.

Of the native yellow-flowered umbellifers, this is the most delicate and airy species, with very fine texture compared to *Thaspium* and *Zizia*.

THASPIUM Nuttall **Meadowparsnip** *Umbelliferae* New Latin, irregular from *Thapsia* (from Latin, a poisonous plant, from Greek, from *Thapsos, Thapsus*, a town (or island) and peninsula in Sicily, now Magnisi). A small genus of herbs found in eastern North America (3 or 4 species) that have yellow flowers and have fruit (schizocarp splitting into 2 mericarps) with all the ribs prominently winged. Fall plant or cold moist stratify(120)
T. barbinode and *T. pinnatifidum* have linear embryos, that are intermediate between rudimentary and spatulate embryos (Martin 1946, Baskin et al 1992). Fall sown seeds of *T. pinnatifidum* germinated in an unheated greenhouse at 76%. Germination also occurs after cold moist stratification at 5º C for 12 weeks. Giberillic acid did not substitute for cold moist stratification. Embryos in fresh seed were 0.7 mm long, but prior to germination they were between 1.5 and 3.6 mm long. *T. pinnatifidum* seeds have deep morpho-physiological dormancy. *T. pinnatifidum* appears to be biennial or a monocarpic perennial. (Baskin et al 1992)

Thaspium trifoliatum (Linnaeus) Gray var. **flavum** Blake *WI YELLOW MEADOW PARSNIP, aka Smooth Meadow Parsnip. Some authors insist the yellow flowered plants are called PURPLE MEADOW PARSNIP. I think they work for the government, probably CMS or Chicago ACOE. (*trifoliatum* three leaved) (*flavus -a um* yellow, yellowish, for the yellow flowers of this variety)
Habitat: Mesic to dry prairies, mesic savanna. Prairies, rocky woods, thickets.
Culture: 120 days cold moist stratification, or best planted outdoors in the fall. Seeds germinate most successfully in cool soil. (pm 09)
Description: general form Branched upright perennial culms 1.0-1.5', stems mostly smooth, with few branches, hollow, ridged leaves basal usually simple, not divided, oval, base cordate, upper oddly pinnate with 35- finely toothed leaflets flowers yellow, 5-merous, inflorescence 1-3" compound umbels, with 6-10 small umbellets on irregular stalks, fruits schizocarp, dry, splitting into 2 seeds (carpels) or mericarps, elliptical, 3/4 as long as wide including the broad wings key features Differs from the similar *Zizia aurea* by the middle flower in each umbel being stalked and fruits are winged not ribbed.
Comments: Blooms 5,6,7. 144,000 to 146,320 seed per pound. "Our plants being var. *flavum* Blake, the petals are always yellow. Usually in thickets, edge of woods and along streams." (Fell 1955)
Associates: Butterflies

ZIZIA W. D. J. Koch *Umbellifera* or *Apiaceae* New Latin, from I. (Johann) Baptist *Ziz*, late 18th and early 19th century German botanist and New Latin *–ia*. The common name Alexanders is from the golden flowers, "the color of royalty" in reference to Alexander the Great. Small genus, 4 North American perennial herbs with ternately compound leaves, yellow flowers in compound umbels, and flat wingless fruit. Attracts butterflies, butterfly larvae. Yellow flowers in umbels late spring and early summer.

Seeds mature in summer, turning burgundy then brown. Code B (Cullina 2000). Fall plant or cold moist stratify (120). Cool soils. "Fall sow, or if not possible cold moist treatment 120 days and sow in early spring. Light cover. Good germination." (Dunham 1993). Germinates in about 2 weeks with GA-3 (JLH). Some say use fresh seed, which needs long stratification, but dried seed fall planted OK works with us. Seeds are semi-recalcitrant. Fruits are nutlets.

Some seed testing data indicate this may be somewhat short-lived seed, with significant lose of viability 6 months after ripening. It ripens early but is slow to dehisce. A seed being slow to dehisce is usually a sign of tolerance to dry storage. Be safe and sow fresh in summer in serious stewardship work.

Zizia aptera (A. Gray) Fernald *CT, IN, MI, RI HEART-LEAF ALEXANDERS, aka Golden Alexanders, Heart-leaved Golden Alexanders, Heart-Leaved Meadow Parsnip, Meadow Zizia, Prairie Golden Alexanders (From Latin *apteros, apter*, without wings, and *–us*.)
Habitat: Mesic, dry, and gravel prairies, open oak woods, prairies and rocky woods, not common. Wooded bottomlands, streambanks, floodplains, and moist meadows. distribution: northern 1/5 of Illinois
Culture: 120 days cold moist stratification, or best planted outdoors in the fall. Seeds germinate most successfully in cool soil. (pm 09)
Description: general form Erect perennial roots thickened cluster of roots culms 1.0-3.0', branched, smooth, sometimes reddish leaves basal simple, undivided, with heart-shaped base, coarsely toothed, long-stalked; upper leaves ternate, or biternate (once or twice 3-parted), margins serrate, crenate flowers yellow, 5-merous, inflorescence compound umbel, each umbellet with many flowers, central sessile or stalkless, mature fruits split into 2 seeds, seeds roughly pentagonal in cross section key features Basal leaves are simple.

Comments: Blooms 4-6. C3. 191,642 to 614,344 seeds per pound. "Common in meadows and other low places. Much like *Thaspium*, growing in the same places and flowering about the same time, but the central flower is sessile. The basal leaves are simple." (Fell 1955)
Associates: Pollinated by bees and Diptera.

Zizia aurea (Linnaeus) W. D. J. Koch. GOLDEN ALEXANDERS, aka Common Golden Alexanders, Golden Zizia (From Latin *aureus*, gold, golden.)
Habitat: Wet and mesic prairies, mesic and wet savannas, woodlands, moist woods and prairies, and fens. Meadows, woods at bluff bases, open woods. Full sun to part shade, moderate moisture to wet, in sandy or loamy soils.
distribution: Occasional in n. 3/4 of state, less common s. ¼.
Culture: 120 days cold moist stratification, or best planted outdoors in the fall. Seeds germinate most successfully in cool soil. (pm 09) Needs stratification for 120 days. Cool soils. Seeded alone plant 11 lbs per acre or 4.4 ounces per 1000 (Shirley 1994).
Description: general form Erect perennial, 1.0-3.0' culms branched, smooth leaves basal biternate, 2 times three parted, upper leaves trifoliate, leaflets with fine, even teeth, margins serrate flowers yellow, 5-merous, inflorescence compound umbel, 10-18 umbellets many flowers on irregular stalks, central flower often sessile or stalkless. Mature fruits split into 2 seeds, seeds roughly pentagonal in cross section.
Comments: Blooms 4-6. C3. Cut flowers. Calcareous soils. 94,969 to 247,075 seeds per pound. Used medicinally as a febrifuge, vulnerary, and for syphilis. The Fox Indians snuffed a stem decoction for headaches.
"Common in low prairies and other damp places. Basal leaves compound." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera, Coleoptera. Attracts butterflies,

Omnia dicta fortiora si dicta Latina

URTICACEAE A.L. de Jussieu 1789 **Nettle Family**. A family of about 45 genera and 1,000 species of herbs, shrubs, vines, and trees, cosmopolitan in tropical, subtropical, and temperate regions.

BOEHMERIA Jacquin 1760 **False Nettle** *Urticaceae* (Georg Rudolph Boehmer, 1723-1803, professor at Wittenberg, of the Saxony Boehmers) Genus of about 80 species, perennial herbs, shrubs, and trees of the warm temperate, subtropical, and tropical regions of the Old World and New World.

Boehmeria cylindrica (Linnaeus) Swartz FALSE NETTLE, aka Bog Hemp, Small-spike False Nettle, Stingless Nettle (cylindric)
Habitat: Moist or shady ground; wet meadows, wet savannas and wet woodlands, upland swamps. "Common in damp open places and low woods." (Fell 1955) In the se USA, swamp forests, bottomlands, bogs, and marshes (Weakley 2007). Tolerant of medium and fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 5.1-7.0. distribution: Throughout Illinois, most of the US except the nw states, West Indies, Bermuda, Central America, disjunct in Argentina, S Brazil, Paraguay, Uruguay, and Venezuela.
Culture: Fall plant. 60 days cold moist stratification. Further germination pretreatments not sure? (pm 09) Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate moderate.
Description: general form Erect perennial with no stinging hairs roots 14 inch minimum root depth culms 1.5-2.5' (4.5) leaves long stalked, opposite, coarsely toothed; smooth or slightly scabrous above flowers monoecious, tiny, green, 4-merous, in remote or crowded clusters, inflorescence unbranched, spikes from the upper leaf axils; oval dry seed N 2n = 28
Comments: Status phenology Blooms 7-9. Ethnobotanical uses, wetland restoration. 2,891,720 to 3,024,000 seeds per pound.

VERBENACEAE J. St.-Hiliare 1805 **Verbena family**

VERBENA Linnaeus **Verbena, Vervain** *Verbenaceae* New Latin, from Latin, singular of *verbenae* sacred ceremonial boughs of laurel or olive or myrtle, a class of medicinal plants, related to Latin *verber* rod, Old High German *werfan* to throw. A genus of 200-250 species of tropical, subtropical, and warm temperate parts of the New World, chiefly American, rarely Old World herbs or subshrubs having bracted flowers in heads or spikes, a regular corolla with a 5-lobed limb, and four one-seeded nutlets, the type of the family Verbenaceae.
"Variations in individuals and extensive hybridization among our 5 native verbenas produce such a mingling of characters that picking out the parents is difficult and at times quite impossible. Dr. Moldenke has named some of these hybrids in his account of the genus in the New Illustrated Britton and Brown and he has reviewed some of our specimens. Hybrids are much more common in some pastures than in others where the opportunity of crossing seems as great. The prairies about Camp Grant and pastures in

Kishwaukee River bottom near Perryville road bridge and on River road south of Cherry Valley are especially prolific. The most common crosses here are X *rhydbergii* and X *moechina*." (Fell 1955)

The seeds ripen from summer to fall, sequentially in the long inflorescences of some species. Seed requires cold moist stratification and light to germinate. Seedlings grow rapidly and bloom 1st or 2nd year. Code B, H. Seed is easier, but both prostrate and upright species can be grown from 2-node nonflowering stem cuttings. (Cullina 2000)

Verbena hastata Linnaeus BLUE VERVAIN, aka Swamp Vervain. Simpler's Joy, Vervain
Habitat: Wet meadows and marshes, wet savannas, mesic savanna, upland swamps swales, damp thickets, and shores, wet woods, wet prairies, wet waste ground. Tolerant of moderate inundation, up to 8", Similar to the rhythms of wet prairies, stream banks and marshes. Nutrient load tolerance moderate. Salt (saline) tolerance moderate to high. Siltation tolerance moderate to high. Full sun. pH 6.0-7.0.
Culture: "Cold moist treatment, or fall sow. Very light to no cover. Excellent germination. Self sows." (Dunham 1993). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Seed needs light to germinate, sow on surface of soil. GA3, dry storage (180), cold moist stratify (90) or fall plant. Easy from seed. Seed may need cold moist stratification @ 33-38°F for 30-90 days. Deno says germination is good when seed is dry stored @ 40º F then shifted to 70º with light. Forma *rosea* requires stratification and light as does the species. Seed widely available from commercial sources. In mixes plant 0.015 to 0.125 pls lbs per acre (USDA 1997, but why take their word?). This may be short lived in plantings. Division of mature plants in spring. Stem cuttings work well in summer.
Description: Perennial herb, up to 3.0-5.0(6)'. Blue/purple flowers, occasionally pink. Hastate leaves.
Comments: Considered invasive by some authorities. Blooms 7,8,9. Cut flowers, ethnobotanical uses, landscaping. Attracts butterflies. Seeds are eaten by wildlife. Small mammals eat new shoots. Aggressive, early successional, short-lived. 1,488,000 to 2,004,415 seeds per pound. Our experience has shown that some seed lots may have low TZ tests but high germination tests.

"Common on roadsides and in open woods and pastures, but usually in damp soil. X *rydbergii* Moldenke, a hybrid with *V. stricta* is common and variable." (Fell 1955)

Verbena stricta Ventenat HOARY VERVAIN, aka Purple Vervain, Purple Verbena, Tall Vervain, Woolly Vervain
Habitat: Dry, hill, and sand prairies, dry savanna, prairies, pastures, and fields, common, degraded prairies, drought tolerant, full sun. Tolerates poor soils. Low moisture requirements. Coarse to moderately fine soils. Neutral to acidic soils.
Culture: Cold moist stratify (30) or fall plant, light. "No pretreatment, or cold moist treatment, of fall sow. Very light cover." (Dunham 1993). 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. (pm 09) Easily grown from cold stratified seed.

Pure stand plant 6 lb per acre (Granite). Plant 0.031 to 0.125 lbs per acre. This species behaves as a sandy-soil seed bank species providing a flush of cover for a few years, and may be short-lived.
Description: Native annual or perennial, 24-30", with long spikes of deep blue to blue-violet flowers. Pale hairy leaves.
Comments: This species is considered invasive in parts of its range by some authorities. Blooms 6,7,8,9. Cut flowers, landscaping. May be initially aggressive to somewhat weedy, early successional and short-lived. A seed bank species in some sandy sites, with color forms not uncommon. Recommended for roadside stabilization and mass planting in dry soils. 448,000 to 650,646 seeds per pound.

"A common roadside weed. On a high prairie road north of Ill. Rt. 70 near Meridian road we found the white form (f. *albiflora* Wadmond) covering considerable areas to the exclusion of the purple form. Roseate flowers (f. *roseiflora* Benke) are very uncommon on Camp Grant prairies." (Fell 1955)
Associates: Pollinated by long-tongued bees, short-tongued bees, other Hymenoptera, Diptera, Lepidoptera. Attracts songbirds and butterflies.

Verbena urticifolia Linnaeus *ME WHITE VERVAIN
Habitat: Wet meadows, wet and mesic savannas, fields, thickets, ditch banks, disturbed woods.
Culture: Cold moist stratify or fall plant, light. Successional restoration.
Description: White flowers, 2.0-5.0'. Species has leaves hirsute on lower surfaces, nutlets about 2 mm long, corrugated on back.
Comments: This species is also considered invasive by some sources. Blooms 7-9. Landscaping, wetland and woodland restoration. 1,116,851 to 2,268,000 seeds per pound. "This commonly grows in damp shady places. On Mitchell road near Ill. Rt. No. 173 we found a patch with blue flowers but lacking other evidence of hybridization. Crosses with *V. hastata*, X *engelmanni*, have small blue flowers. Not common." (Fell 1955)
Associates: Low food value for deer.

The earth laughs in flowers Emerson

VIOLACEAE Batsch 1802 **Violet Family** A family of about 20 genera and 900 species of herbs, shrubs, and trees. cosmopolitan.

VIOLA Linnaeus 1753 **Violet, Johnny-jump-up, Pansy** *Violaceae* From Latin *viola*, name for one of several scented flowers, of non-Indo-European origin, the classical Latin name for violets; akin to the source of Greek *ion* violet. A genus of about 525-600 species of herbs and rarely subshrubs of temperate regions of the Old and New Worlds.

Fruits are capsules that spring open, throwing seed when ripe. Most species also produce cleistogamous flowers.

The hydrophilic seeds ripen from spring to summer. The seed capsules explode when the seeds ripen, turning from white to brown. Cullina (2000) notes that when seeds are about to split, the stalks uncurl and straighten upright, and lengthen. The capsule color changes from green to yellowish or mauve. Place seed capsules in a sealed paper bag. You may wish to place the paper bag in your office and listen to the drying capsules exploding like a slow motion bag of microwave popcorn. Clean seed, store in a ziplock, and plant in the fall. Code B*.

Viola lanceolata Linnaeus *MN, VT LANCE-LEAVED VIOLET, aka Bog White Violet, Strap-leaved Violet
Habitat: Moist sandy soils or mucks, sandy peat flats, and wet loamy sand. Open moist meadows, bogs, streambanks, in sandy soils.
Culture: see above
Description: general form erect perennial forb culms basically stemless leaves narrow, usually 3 1/2 to 6 times as long as wide, tapering to the base, rounded teeth flowers white 5-merous, 1"-1 1/2" wide, beardless, 3-lower petals with brownish lines at the base, 2-upper petals oblong; solitary; fruits elliptical capsule, seeds light brown key features Stemless, flowers beardless, leaves 3.5-6 times long as wide.
Comments: Blooms 4-6. 2,500,000 (jfn2004) seeds per pound.

Viola papilionacea Pursh.
60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Best planted outdoors in the fall. (pm 09) "Common blue violet, subject here to its usual variations and hybridizations." (Fell 1955)

Viola pedata Linnaeus BIRDFOOT VIOLET, aka Pansy Violet, Hens and Roosters
Habitat: Mesic, dry, gravel, and sand prairies, savannas, dry open rocky woods and prairies, sandy or acid soils. not in areas of intense competition.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Best planted outdoors in the fall. (pm 09) Difficult to grow, best from dry stratified seed (?). Cold moist stratification or fall plant. Seed at 4 lb per acre (heaven forbid you had 4 lbs!)
Description: Showy flowers, pleasingly fragrant, pollinated by Long-tongued bees, Diptera, Lepidoptera 3-6", attracts ants, butterfly larvae, game birds eat roots. This is said to be the only noncleistogamous species (Cullina 2000). Only moderately competitive. 300,000 seeds per pound. "Common in sand areas. The white form grows north of Shirland near the state line and the roseate form in Sugar River Forest Preserve. It frequently blooms again in the fall. We do not have it in the bi-colored form." (Fell 1955)

Viola pedatifida G. Don PRAIRIE VIOLET, aka Crowfoot Violet (*pedatifida* Latin bird-footed, palmately divided with the side divisions split again, bird's foot-like, from *pedatus*, from *pedo*, to furnish, have feet, and *fidus*, past participle, from *findo*, to cleave, split, separate, divide; or generally divided from a central point with divisions also deeply-clefted)
Habitat: Mesic, dry, and upland prairies.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Best planted outdoors in the fall. (pm 09) Best from fresh stratified seed
Description: Showy flowers pollinated by long-tongued bees, 3-6", attracts ants, butterfly larvae, game birds eat roots, only moderately competitive. 352,000 seeds per pound. "A very pretty blue-violet found on most upland and many low prairies. The tendency to hybridize is marked, particularly with *V. sororia* and *V. papilionacea*. Gravelly prairie west of Rockton, prairie hillside south of Roscoe, low prairie northeast of Shirland and the C. & N.W. Ry. east and west of Rockford." (Fell 1955)

Viola pubescens Aiton DOWNY YELLOW VIOLET, aka Yellow Forest Violet, Yellow Violet (*pubescens*, becoming hairy, from Latin *pubescens*, *pubescent*, from *pubesco*, to reach puberty, become pubescent.)
Habitat: The species occurs in rich woods, rare.
Culture: 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy and germinate. Best planted outdoors in the fall. (pm 09)
Description: Blooms 4-5, leaves and at least the upper half of the stem densely pubescent, basal leaves 1-2, rare, n. 1/2 of Ill. Includes var. *peckii* House with glabrous capsules. Seed not available.

"Much less common than *V. eriocarpa* from which it is not well separated. In the hilly dry woods northeast of Roscoe is a plant that has basal leaves at flowering time and is definitely pubescent." (Fell 1955)

Ferns and Fern Allies

DRYOPTERIDACEAE Herter (or *Dryopteridaceae* Ching 1965) **Wood Fern Family.** From the Greek *drys* oak, or tree, and *pteris* a kind of fern, from *pteron*, a feather, a wing. A worldwide family, concentrated in temperate and montane areas. Ca. 60 genera and 3000 species, or 40-45 genera and 1700 species if *Onocleaceae* and *Woodsiaceae* are excluded.

ONOCLEA Linnaeus 1753 **Sensitive Fern** *Dryopteridaceae* *Onoclea* from the Greek *onokleia*, name used by Dioscorides for some probably boraginaceous plant from Greek *onos*, a vessel, and *kleio, kleios, kleien*, to close, refering to the pinnules of fertile fronds curling round the sori, enclosing them. Monotypic genus, relictual distribution in temperate eastern North America and eastern Asia. x = 37.

Onoclea sensibilis Linnaeus SENSITIVE FERN, aka Bead Fern, Meadow Brake, *onoclée sensible* (*sensibilis* sensitive to early frosts, sensitive; manifesting irritability. The leaves are sensitive to and wither from light frosts.)
"Young fronds are often killed by frost a number of times before growth gets started in the spring." (Fell 1955)
Habitat: Marshes, fens, moist woods, muddy shores. Acid soil of marshes, swamps, moist open woods and wet meadows. Wet meadows, thickets, and woods; stream and riverbanks; swamps and bogs; usually in slightly acidic soil. "Frequent in low damp, open places and in low woods but nowhere abundant enough to be weedy." (Fell 1955) distribution
Native to eastern North America and eastern Asia, naturalized in Western Europe
Culture: Division, spore propagation, successional restoration. In cultivation, *Onoclea* may become weedy.
Description: 1.0-1.5'. Spreads by long rhizomes, often forming thick stands. 2n = 74.
Comments: Blooms, as it were 5-10. Sporophylls are produced from May to October. Attractive dried 'seed heads'. Wetland restoration, provides food for game birds and deer. 17,000,000 spores per gram or 7.7 billion per pound. (Plant Reproductive Ecology: Patterns and Strategies, Jon and Lesley Lovett-Doust, 1988).

Onoclea has green spores, or spores containing chlorophyll. Green spores are viable for a few days to a few months, where nongreen spores are viable for three to many years. Green spores are metabolically active and germinate within a few days of sowing. (Moran 2004) As with *Matteuccia struthiopteris*, the sporophylls of *Onoclea sensibilis* are persistent through the winter and the green spores are released in spring before the sterile leaves expand. ((fna), www.rook.org/earl/bwca/nature/ferns/onoclea.html)

"Two contrasting phenologic and morphologic patterns for temperate pteridophytes bear special mention. In the first of these, green spores are shed in early spring from sporophylls that were produced by stored photosynthate from the previous year. These sporophylls may either flush in early spring (as in several *Equisetum* species and *Osmunda cinnamomea*) or may have persisted from the previous fall, with spores stored in contracted pinnae (as in *Equisetum hyemale*, *Onoclea sensibilis*, *Matteuccia struthiopteris*). Green spores are capable of immediate germination and, in nature, have very brief periods of viability. In contrast, in a greater number of pteridophytes, fertile leaves are produced from the current year's growth photosynthate, and the non-green spores are shed from midsummer to fall. A intermediate strategy is seen in *Lorinsera areolata* in the Gulf Coastal Plain. This fern sheds most of its non-green spores in midwinter and stores a low portion in dead erect sporophylls that release spores slowly through the following summer. Nongreen spores lack enforced dormancy and require a few days of hydration prior to germination. Such spores are known for their remarkable retention of viability over prolonged periods of laboratory and herbarium storage. It is now clear that several mechanisms may operate to form a "spore bank" in nature. Spores stored in soil or on dead erect or prostrate fertile leaves have retained viability for at least a year." (Lovett-Doust & Lovett-Doust 1988 page 319)

Early Tertiary *Onoclea* fossils (55 million years old) have been found in Canada, Greenland, Japan, eastern Russia, the United Kingdom, and the western United States (Rothwell and Stockey 1991).

EQUISETACEAE L.C. Richard ex de Candolle 1805 **Horsetail Family**

EQUISETUM Linnaeus 1753 **Horestail, Scouring Rush** *Equisetaceae* From Latin *equus*, horse, and *seta*, bristle, animal hair, for the resemblance of some branched species to a horses tail, or for the coarse black roots of *E. fluviatile.* A 300 million year old genus currently of ca. 15 species, 11 species in northern North America, nearly cosmopolitan.

Spores are equipped with elaters, long appendages that expand and contract with changes in humidity. Elaters function to dig the spore into the soil and to tangle spores together, thereby creating a larger propagule and increasing the probability that prothalli will be close enough to ensure fertilization. Elaters may also aid in wind dissemination, acting as parasails when expanded in dry weather. Spores released by the cone bearing stems are dispersed by wind or water. The spores are green, thin-walled and quickly germinate under moist, illuminated conditions. Spores remain viable for 5 to 17 days (Hauke 1963). x = 108.
Due to their ephemeral lifespan, Equisetum spores are not suited for use in commercial restoration.

Equiseti are best established by cloned plants, but be aware some species form large monocultures.

Equisetum hyemale Linnaeus SCOURING RUSH, aka Common Scouring Rush, Rough Scouring Rush, Bottlebrush, Horsetail, Field Horsetail, Pewterwort, Pipes, Rough Horsetail, Dutch Rush, Scouring Rush Horsetail, Tall Scouring Rush (*hyemalis -si -e* of winter, wintery, flowering in winter, *hiemalis* in older literature, from *hiemalis,* of winter, wintery.)
(Code? Ken Schaal) 2n = 216. Cones maturing in summer, old stems sometimes developing branches with cones in spring (fna). "Particularly common in moist sandy places but also frequent in dry places often forming dense thickets. Perennial as to stems." (Fell 1955)

ISOËTACEAE Dumortier 1829 **Quillwort, Merlin's Grass.** A monogeneric family of about 300 species. *Isoëtaceae*, *Selaginellaceae*, and *Lycopodiaceae* are only distantly related to other extant pteridophytes and seed plants. (Weakley 2007)

ISOËTES Linnaeus 1753 **Quillwort, Merlin's Grass, *isoète*** *Isoëtaceae* New Latin, from Latin, the name for a small houseleek or ayegreen, *Sempervivum tectorum*, from Greek, from neuter of *isoetes* equal in years, from *is-*, *isos*, equal, and *etos* year. Widely distributed cosmopolitan genus of about 300 (150) species of fern allies comprising the primarily aquatic, marsh-growing, or terrestrial ephemeral quillworts that have a short buried lobed stem from which arises a tuft of quill-shaped leaves bearing sporangia in their axils. 24 species in northern North America. Quillworts are some of the last living relatives of the fossil tree lycopods, with which they share some unusual features including the development of both wood and bark, a modified shoot system acting as roots, bipolar growth, and an upright stance. These plants are the only living plants exhibiting rhixotaxy, which also occurred in lycopods. x = 11.

Isoëtes melanopoda Gay & Durieu ex Durieu *GA, IN, IA, KT, MN, NJ, TN BLACKFOOT QUILLWORT, aka Black-based Quillwort
Habitat: Noncalcareous soil; meadows, fields, ditches, soil pockets on rock outcrops. *Isoëtes* appeared in formerly farmed wetland north of our office.
corm with fibrous roots, diploid species 2n = 22; leaf bases are blackish or sometimes pale (ilpin).
Comments: Spores mature in late spring. C3?

OSMUNDACEAE Berchtold & J.C. Presl 1820 **Royal Fern Family**

OSMUNDA Linnaeus **Royal Fern, Cinnamon Fern, Interrupted Fern** *Osmundaceae* *Osmunda* possibly from New Latin, from post-classical Latin, from Old French *osmonde (*or Anglo-Norman *osmond).* Or from Saxon (not Celtic, but there are a couple of Celtic references out there), *Osmunder*, surname of Thor, the god of war; or from the Saxon god *Osmunder* the Waterman, who hid his family from danger in a clump of these ferns. Possibly from the Scandinavian writer Asmund (c. 1025) who helped prepare the way for Swedish acceptance of Christianity. More likely from any of many old Germanic language group versions of *osmunder* (see OED), a possible place name for where bog iron was produced, or a term for bog iron itself. Also folk etymology from Latin *os mundi,* bone of the world. It is possible *Osmunda* grew where bog iron ore was mined. The name also has as a root the Greek verb *osmeo*, to smell, and Linnaeus did name the cinnamon fern, so … It has also been suggested by more than one source the derivation is unknown.

Osmunda cinnamomea Linnaeus CINNAMON FERN, aka Buckthorn, Fiddle Heads, *osmonde cannelle*
(*cinnamomeus -a -um* cinnamon-brown, resembling cinnamon, light brown with red and yellow)
Habitat: Swamps, low woods, and thickets (Yarnell) "Found in the boggy places in the Shirland-Rockton sand area but not known elsewhere in the county." (Fell 1955)
Description: 2n = 44. New nomenclature *Osmundastrum cinnamomeum* (Linnaeus) C. Presl.

Osmunda claytonia Linnaeus INTERRUPTED FERN (*claytonia* New Latin, from John *Clayton* (1686-1773) Virginia botanist and physician and New Latin *-ia.)*
Habitat: "Uncommon but more frequent than the preceding. In boggy places in the open and in the low woods in Coon Creek bottom; very uncommon in the Kishwaukee River gorge. This and the preceding are common in the Castle Rock area." (Fell 1955)
Description/comments: 2n = 44. Late Triassic *Osmunda claytonia* fossils, about 200 million years old have been found in Antarctica (Phipps et al. 1998).

Osmunda regalis Linnaeus ROYAL FERN, aka American Royal Fern, Flowering Fern, *osmonde royale*
"More frequent than the other species, in the same boggy areas and the same low woods in Coon Creek bottom. Also in other low places in the sand area. Unknown elsewhere in the county. Uncommon at Castle Rock." (Fell 1955)
var. *spectabilis* (Willdenow) A. Gray 2n = 44.

Credo Elvem etiam vivere.

Sources and much more information are available on our informational CD, Designing with Nature, UP UR C21.
revised 11 March 2010