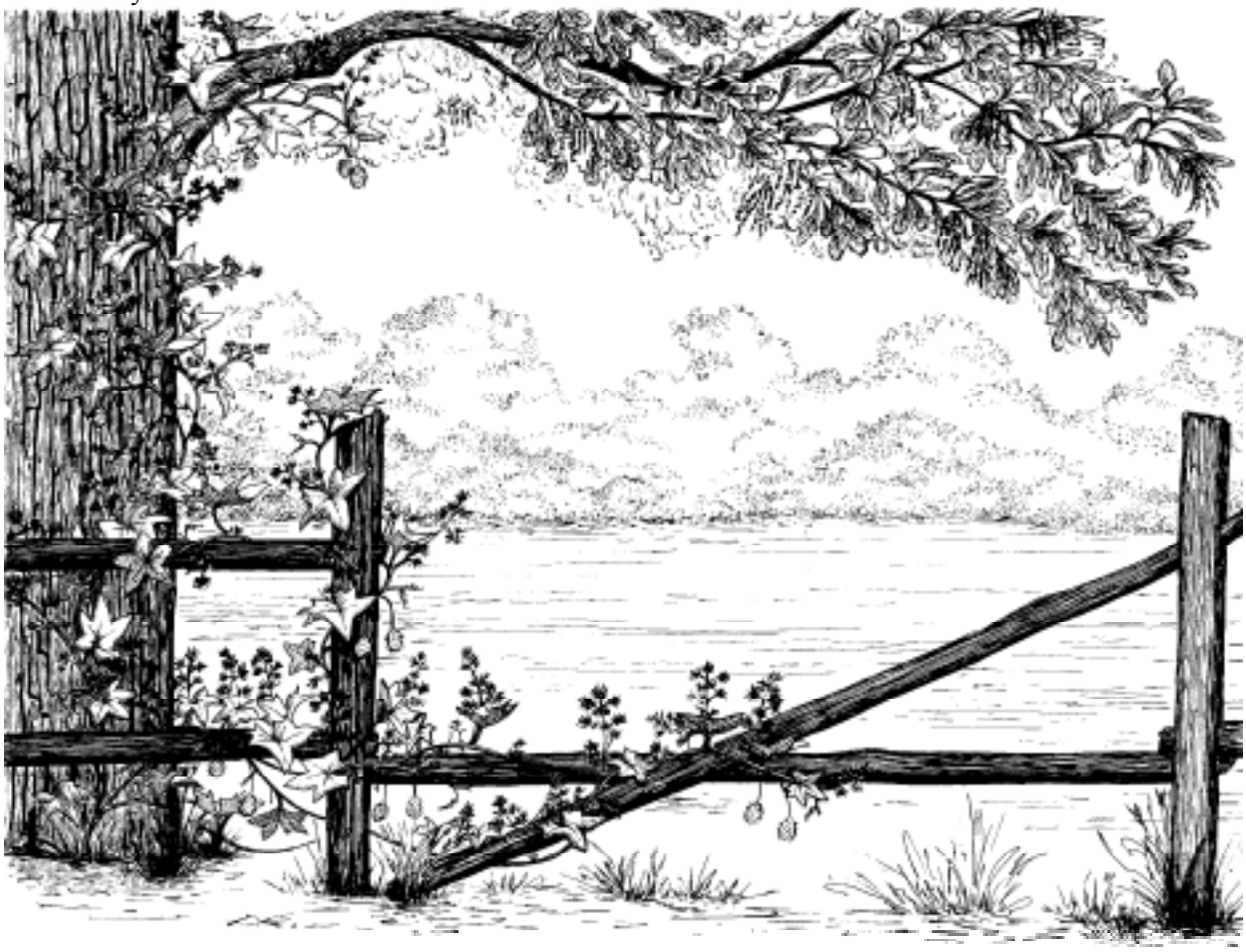
LEGUMINOSAE
PART ONE

Caesalpinioideae, Mimosoideae, Papilionoideae, *Amorpha* to *Desmodium*

Revised 04 May 2015



BEAN FAMILY 1

CAESALPINIACEAE	Cassia	Amphicarpaea
	Cercis	Anthyllis
	Chamaecrista	Apios
	Gleditsia	Astragalus
	Gymnocladus	Baptisia
	Senna	Caragana
MIMOSACEAE	Desmanthus	Cladrastus
	Mimosa	Coronilla
	Schrankia	Crotalaria
PAPILIONACEAE	Amorpha	Dalea
		Desmodium

--- “No family of the vegetable kingdom possesses a higher claim to the attention of the naturalist than the Leguminosae, wether we regard them as objects of ornament or utility. Of the former, we might mention the splendid varieties of Cercis, with their purple flowers, the Acacias, with their airy foliage and silky stamens, the Pride of India, Colutea, and Cæsalpina, with a host of others, which, like the Sweet Pea, are redolent with perfume. Of the latter, the beans, peas, lentils, clover, and lucerne, are too well known to require recommendation. Among timber trees, the Rosewood (a Brazilian species of Mimosa), the Laburnum, whose wood is durable and of an olive-green color, and the Locust of our own country are preëminent.

The following are a few important officinal products of this order. In medicine; *liquorice* is the product of the root of Glycyrrhiza glabra of S. Europe. The purgative senna consists of leaves of Cassia Senna, C. acutifolia, C. Æthiopica, and other species of Egypt and Arabia. C. Marilandica is also a cathartic, but more mild than the former. The sweet pulp *tamarind*, is the product of a large and beautiful tree (Tamarindus Indica) of the E. and W. Indies. Resins and Balsams: *Gum Senegal* is yielded by Acacia Verek of the River Senegal; *Gum Arabic*, by several species of Acacia of Central Africa; *Gum Tragacynth*, by Astragalus verus, &c., Persia. *Balsam Copaiva* is the product of several species of Copaifera, natives of Brazil and W. Indies; *Balsam Tolu* of Myospermum toluiferum of Peru and Balsam Peru of M. peruiferum of the same county. Dyes, &c.,; Indigo, the most valuable of all (but a violent poison), is the product of several southern species of Indigofera, as I. anil of the W. Indies, and I. argentea of Egypt. *Brasil-wood* from Cæsalpina Braziliensis. Log-wood from Haematoxylon Campeachianum, of Campeachy, and Red Sandal-wood from Pterocarpus santalinus of Egypt, &c. &c.” (Alphonso Wood 1864)

ALPHABETICAL LIST OF PLANT MATERIALS

LEGUMINOSAE AL de Jussieu 1789 or *Fabaceae* Lindley 1836 **THE PEA FAMILY**

The bean family is the third largest plant family in the world behind grasses & asters. In the broad sense, it is a cosmopolitan family of trees, shrubs, lianas, vines, & herbs of about 730 (650) genera & 20,000 (15,000, 18,000, or 19,000) spp, worldwide; in NA (?) & Illinois (46 genera & 131 spp). The taxa sort into 3 natural groups that have been treated variously as families, subfamilies, or tribes. Legumes originated about 560-59 million years before the present, & the 3 subfamilies were differentiated soon after (Sprent & James 2007). These groups are more closely related to each other than to any other groups in the plant kingdom. The *Leguminosae* family is defined as a family with three subfamilies, or is treated as three closely related families, as in *Caesalpiniaceae, Papilionaceae,* & *Mimosaceae,* or *Caesalpinioideae, Papilionoideae* (*Faboidea*), & *Mimosoideae.* Recent molecular evidence may make the three-family division untenable (Dilworth et al 2007). The name *Fabaceae* is used mainly in the USA & Australia, & *Leguminosae* elsewhere.

Woody genera are most common in the Southern Hemisphere & the tropics. Herbaceous genera are most numerous in temperate areas, & are very numerous in Mediterranean climates. Legumes are very important in composition of Midwest prairies, the 3rd (or 4th) most numerous after grasses, composites, (& sedges?).

three ‘families’ / 3 sub families

Cercis has flower morphology like the *Papilionoideae* (*Faboidea*). The non-compound leaves are unique. Some authors place *Cercis* in its own subfamily or in a sister group to the legume family.

flower structure, gynoecium, & the legume pod;

All legumes have seeds enclosed in variously shaped pods. (Some tropical spp have pods, which may be like samara-like or drupaceous.) Similar appearing pods occur on *Catalpa* & its relatives. Tree form legumes have alternate leaves, & nearly all have compound leaves (except *Cercis* & some *Acacia*), buds small & inconspicuous, & many with 1-2 thorny twigs next to each bud.

Legumes are important worldwide as a source of human food, including beans, peas, peanuts, lupines, & lentils, & for providing many forage spp. In some regions, legumes provide firewood for heating & cooking. Many spp are used as ornamentals. Legumes also provide restoration & erosion control materials. Legumes are important nectar sources, larval hosts, & provide highly nutritional seeds & pods as wildlife foods. Woody spp are used for landscaping, windbreaks, wildlife plantings, firewood, furniture, fence posts, & railroad ties. Several spp have become aggressive & invasive when grown outside their native range.

rhizobia & mycorrhiza

Nodulation uses a significant portion of the total carbon fixed by the plant. This suggests that when nodulating legumes evolved, there may have been an excess of CO2 & a deficit of N in the atmosphere. 55 million years ago, evidence suggests there was a major peak in CO2, temperature, & humidity.

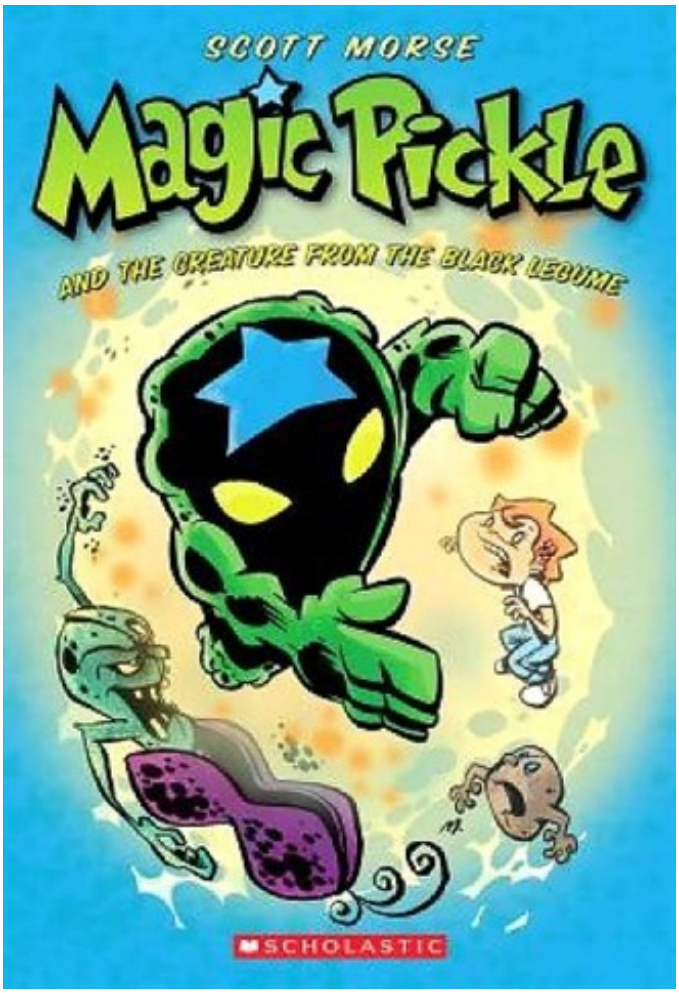
The rhizobial fixation of nitrogen causes nitrogen levels in legume tissues higher than other types of plants. Hence, legumes provide nutritious, high protein forage for grazers & browsers & high protein seeds for humans & other animals. In agricultural crops, inoculated legumes increase soil nitrogen as an economical & ecologically sound alternative to manufactured nitrogen fertilizers. Nodulation versus non-nodulation is often used to divide legume spp into genera. Only 3 legume genera have both nodulating & non-nodulating spp (Sprent 2008).

Inoculating bacteria were formerly considered to be solely of the genus *Rhizobia,* but now include *Allorhizobium, Azorhizobium, Bradyrhizobium, Mesorhizobium, Rhizobium, & Sinorhizobium*.

William G Bambill Jr, 1953, The *Leguminosae* of Illinois, Illinois Biological Monographs: Volume XXII, No. 4, The University of Illinois Press, Urbana.

JI Sprent & EK James, 2007, Legume Evolution: Where Do Nodules & Mycorrhizas Fit In? Plant Physiology, June 2007, Vo. 144, pp 575–581, www.plantphysiol.org 2007American Society of Plant Biologists.

Ce sont mes contradictions.



CAESALPINIACEAE or *Caesalpinioideae* **SENNA FAMILY** from *Caesalpinia* (keye-sal-PI-nee-a, or kee-sal-PI-nee-a or colloquially see-sal-PI-nee-a) New Latin, from Andrea Cesalpino (*Andreas Caesalpinus*) died 1603 Italian botanist, & New Latin *–ia*. The Italian Cesalpino would have been pronounced with a soft c, ch, or s sound, while the Latinized *Caesalpinus* would be pronounced with a hard c or k sound. *Caesalpinia* is a genus of 171 genera (about 2250 spp), usually small, spiny tropical trees having evenly bipinnate leaves & small whitish-green, yellow, or reddish flowers in showy racemes.

The family characteristics are: leaves alternate, with stipules, pinnate or bipinnate (except *Cercis*), flowers variably conspicuous, with one simple pistil that becomes the legume, corolla irregular, imperfectly papilionaceous or not at all, sepals 5 free or fused, & petals 5 free, petals imbricated in the bud, uppermost petal enclosed by the lateral ones in the bud, stamens 5-10. Mainly trees of the moist tropics, flowers zygomorphic, but variable, nodulation rare, nodules with primitive structure. Nodulation has been fully confirmed only in 8 genera, including *Chamaecrista.* The non-nodulating *Senna* & *Cassia* were formerly included with *Chamaecrista* in *Cassia sensu lato*.

Split into *Cassieae, Caesalpinieae*, & *Cercideae.*

CASSIA PARTRIDGE-PEA, SENNA, SICKLEPOD, WILD COFFEE, COFFEEWEED *Caesalpiniaceae Cassia* Cas'sia (KA-see-a) Middle English, from Old English, from Latin *casia, cassia*, a tree with an aromatic bark, like cinnamon, or the sweet-smelling *mezereon*; from Greek *kasia, kassia*, a name for this spp or a related genus of Semitic origin; akin to Hebrew *qesiah* cassia; alternately from Hebrew *Katzioth*. Yellow-flowered herbs, tender

shrubs, & trees that are native to warm regions, having even-pinnate leaves sometimes much reduced & nearly regular flowers with calyx teeth equal & usually longer than the corolla..

Some Old World spp are the main active ingredient in many over the counter herbal laxatives & act as a stimulant. As recently redefined, *Cassia* in North America is limited to several adventive spp in Florida.

Formerly broadly defined, the Midwestern taxa of this genus are currently split into *Senna* P Miller 1754 & *Chamaecrista* (Linnaeus) Moench. In Illinois native spp, rare weeds notwithstanding, this separation coincides with perennials & annuals. Midwestern perennial spp are placed in the genus *Senna*. Legume many-seeded, 1-celled, or many-celled transversely. Seeds ripen in late summer, early fall. Some spp explosively dehisce when ripe & must be harvested when the pods yellow. One spp splits open & gradually looses seed, while the pods of another spp remain intact through the winter, often into the next spring

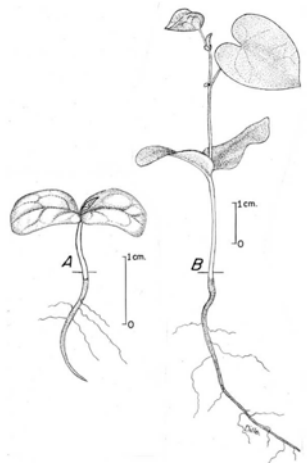
Scarify, moist cold stratify 10 days, inoculate, & careful division of mature plants for perennial spp. 10 days cold moist stratification greatly improves greenhouse germination, but is not absolutely required. Scarification is required. The perennial spp develop heavy root systems & should not remain in a pot for extended periods. Field sow fall, spring, or early summer. Code B, I. (cu00)

Propagation protocols for *C covesii*, & *C roemeriana* include nicking the seed coat with file or needle, soaking the seed for 6-8 hrs, & sow in spring (pots). Woody *Cassia* spp may be host to ectomycorrhiza.

CERCIS Linnaeus 1753 **RED BUD, JUDAS TREE** *Caesalpiniaceae* *Cercis* (KER-kis) New Latin, from the name for JUDAS TREE, from the classical Greek κερκὶς, *kerkis*, the weaver's shuttle, in reference to the legume (w73), while others suggest perhaps from *kerkos* tail, from the movement of its leaves in the wind, also a horn(?). A small genus of 6-10 (11) spp, widely distributed deciduous shrubs or low trees, of north temperate areas, leaves simple, with irregular pink to reddish or white flowers borne on the old wood. Flowers appear papilionaceous, but with standard smallest & inside other petals. 4 spp in North America, 1 in eastern & southern Europe, 1 in central Asia, & 5 spp endemic in China.

Cercis has flower morphology like the *Papilionoideae* (*Faboidea*). The non-compound leaves are unique in the *Caesalpiniaceae*. Some authors place *Cercis* in its own subfamily or in a sister group to the legume family. "Apparently the basalmost (evolutionarily the earliest diverging) extant genus in the *Fabaceae* (Lewis et al 2005)" (in w12)

Cercis occidentalis need little or no cold moist treatment & germinates in a few weeks after scarification and sowing (cu02).



Cercis

Line drawing by Dille Courtesy of USDA Forest Service USDA-NRCS PLANTS Database

Cercis canadensis Linnaeus *CT, NJ EASTERN REDBUD, aka AMERICAN RED BUD, REDBUD, JUDAS TREE, (canadensis -is -e (kan-a-DEN-sis) of or from Canada or NE USA.)

Habitat: Rich woods, ravines, fencerows, & sunny locations. In rich soil on wooded slopes & in bottomlands along streams. Forests. In the se USA, moist to dry forests & woodlands, especially over calcareous or mafic rocks (w11). Common understory tree in rich, well watered forests (Sibley).

distribution/range: Common throughout Illinois except the northern cos. Northern Illinois is on the north edge of its range; hence, it is important to

plant northern source genetic stock. Sp is not mapped from Henry Co, but there is a naturalized stand in a fencerow along Rt 92 immediately east of Rock River. We have seen this naturalizing from cultivation at Chestnut Mountain in Jo Daviess Co at the foot of Chestnut Mt. It is introduced in Wisconsin.
Culture: The hard coated seeds should be scarified by sanding or by hot water soaking. Sow seeds outdoor in an unheated cold frame to winter over. Transfer seedlings into liners. If well managed, they will bloom in 4-5 years. 16,384 (jfn04); 18,080 (aes10) seeds per pound.

cultivation: Prefers alkaline soil. Shade tolerant.

Description: Native, small to medium size, deciduous, understory tree to 35(66)'; spreading branches & short trunk, rounded (spreading) crown of slender zigzag branches; bark on young trees gray, developing orange furrows, bark on older trees in small scales, gray to cinnamon red (red brown); twigs dark reddish with many white lenticels, leaf buds inconspicuous, flower buds larger, clustered on older branchlets; leaves simple, 4.0", entire, round to heart-shaped, hanging down, emerging leaves often distinctive golden-green, with yellow (golden-yellow) fall color; stipules caducous; inflorescence small clusters along branches in sessile fascicles; flowers small, purple pink (pink or rose, magenta/pink, red), occasionally white, imperfectly papilionaceous (pea-like), appearing before the leaves; legumes 2.5", oblong, flat, glabrous, green or red turning reddish-brown, the upper suture with a prominent margin, persisting into late winter. key features: ①"Flowers are in umbel-like clusters from previous years growth appearing before leaves" (Ilpin). ②"The smooth, medium gray bark is distinctive in winter" (w11).
Comments: status: Special Concern in Connecticut. Endangered in New Jersey. phenology: Blooms 4-5. C3. Collect seed pods as they dry & blacken in the fall, or the persistent pods can be picked in early winter. Flowers appear in early spring, in advance of the leaves in small, lateral clusters, covering the whole tree in purple. The flowers appear all over the tree, even on large branches & the trunk. Pods mature in summer but may persist into winter. A popular ornamental tree, used in gardens, borders, specimen plantings, & streetscapes, important early spring color. Good golden-yellow fall color.

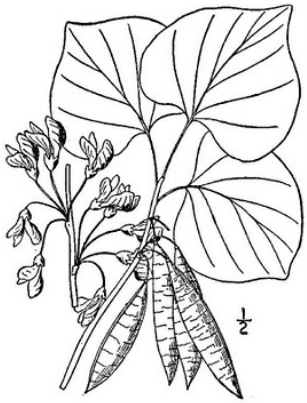
The wood fluoresces bright yellow under ultraviolet lights (Hoadley 1986).

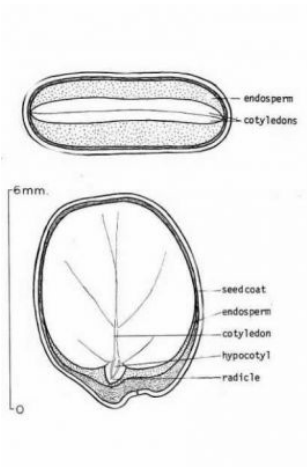
In northwest Illinois, since the retreat of the Woodfordian glaciers, REDBUD has not moved up out of the protection of the river valleys, & is absent from our prairie groves (or perhaps it did move, was driven back, & it has not rebounded since the Altithermal interval).

In small towns & rural plantings, this sp generally has a 3-6 year life expectancy (alternately due to the all to common Tennessee source plants being grown out in Illinois nurseries or sold at box stores). The larger the protective microclimate is, the larger & older the REDBUDS become. It survives better in the shelter of medium-sized urban areas than in rural areas. Rare, exposed, rural specimens 6 inch DBH or greater are known (Rt 172 north of Tampico).
Associates: Host & nectar source for *Callophrys henric*i HENRY'S ELFIN. Larval host *Automeris io* IO MOTH. Nectar source for *Battus philenor* PIPEVINE SWALLOWTAIL, *Dolba hyloeus* PAWPAW SPHINX, *Erynnis juvenalis* JUVENAL'S DUSKYWING SKIPPER, & *Eurytides marcellus* ZEBRA SWALLOWTAIL. Attracts hummingbirds. Songbirds eat the seeds. Beavers eat the bark.

ethnobotany: The young twigs will dye wool a nankeen color (yellow or buff, after Nanjin (Nankeen), China) (w73). The flowers & young fruits are said to be edible.

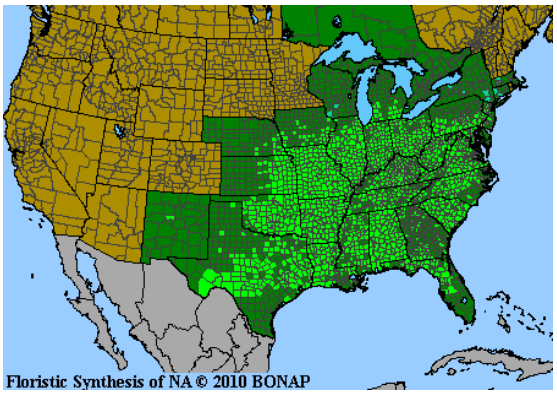
"The old author Gerarde in compliance with the popular notion of his time says "This is the tree whereon Judas did hang himself, & not on the elder tree, as it is said." " (Wood 1873)
VHFS: *C canadensis* f *alba* Rehd is distinguished by its white flowers.











Cercis canadensis, note cauliflory.

Line drawings Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Seed diagram USDA-NRCS PLANTS Database - Not copyrighted image. Leaves at dawn by James Apian Alwill. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

CHAMAECRISTA Moench 1794 **SENSITIVE PEA, PARTRIDGE PEA** *Caesalpiniaceae Chamaecrista* low crest, New Latin from Greek χαμαί, *khamai,* on the ground, & Latin *crista, cristae* f, crest or comb of bird or beast; plume of a helmet; plant yellow-rattle; clitoris. As a specific epithet, *Chamaecrista* was formerly capitalized. A genus of about 250-350 (265, 330) spp of shrubs & herbs with the, mostly of tropics & warm temperate areas. *Chamaecrista* is the eighth largest genus in the legume family. Local spp are yellow-flowered with the flowers loosely arranged throughout the foliage. Formerly part of a broadly defined *Cassia.*

Chamaecrista fasciculata (Michaux) Greene *MA (in part) PARTRIDGE PEA, aka BEACH SENSITIVE PLANT, DWARF CASSIA, GOLDEN CASSIA, LARGE -FOWERED SENSITIVE PEA, LOCUST WEED, MAGGOTY-BOY-BEAN, PRAIRIE-SENNA, SHOWY PARTRIDGEPEA, SLEEPING PLANT, (*fasciculatus -a -um* from Latin *fasciculatus*, fascicled, clustered, in close clusters or bundles, banded, in bundles, from *fasiculus*, bundle, packet, & *–atus*, possessive of or likes of something.) facu-

Habitat: Mesic, dry, & sand prairies. Fields, meadows, roadsides, railroad cinders, prairies, disturbed ground. "Sp tolerates poor soil & drought; used on banks, sloped, & rocky areas; meadows; roadsides; disturbed ground" (Ilpin). distribution/range: "Common in Sugar River sand area & in a sandy place west of New Milford on Kishwaukee River." (ewf55) Common in Illinois, in most cos. Known from but not mapped from Bureau Co.

Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (he99) ③No pretreatment needed.

Scarify. Sow seeds just below the soil surface at 70ºF & water. (ew11) ④"PROPAGATION COMMENTS: Form - seed planted in early spring or late fall at 15-25 lbs/acre." (Ilpin). Growth rate rapid. Seedling vigor high. Vegetative spread rate none.

seed counts & rates: 7,520 (aes12); 41,344 (gnak11); 43,200 (pm02); 48,247 (gnih06); 50,000 (stock); 52,800 (ew11); 56,700 (appl01); 54,944 (gna04); 58,138 (gna06); 60,800 (pn02 & jfn04); 65,000 (usda, ecs); 67,249 (gnhss02); 75,600 (sh94); 144,000 (wns01) seeds per pound. "Recommended seeding rate 15-25 lb per acre" (Anon 1981). In monocultures, plant 8 oz per 1,000 sq ft (stock).

cultivation: Space plants 1.25-1.5'. Sp is seldom planted as plants. Plants are horribly cost inefficient. Tolerates poor soils & drought. Tolerates clay soils. Used on banks, slopes & rocky areas. Full sun to partial shade, mesic to dry soils. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 6.5-7.5.

bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but early spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed. Annuals may benefit from planting 2 weeks before the last spring frost. Germ 30.2, 24, 16, sd 22.4, r4.0-82 (78)%. Hard 46.3, 46, 28, sd 21.2, r11-84 (73)%. Test 22, 20, 21, r14-33 days. (#27)**

greenhouse/garden: Scarify & moist cold stratify (10 days), inoculate or dormant seed. Plant in early spring or late fall. Easy to establish on disturbed sites. Self-sows.

Description: Reseeding, native, erect, annual forb; 4" to 36", with fine hairs; roots minimum depth 14"; stems; leaves alternate, pinnately-divided into 5-18 pair of leaflets; inflorescence a 1.0-6.0", leafy cluster or raceme of stalked flowers; flowers yellow, 5-merous, 0.50-0.75" wide, petals mostly equal, 4 with red at the base & 10 very unequal stamens; fruit is a flat, straight, pod, readily opening when mature; N. key features: ①Petals almost equal, pod is flat, readily opening when ripe. ②"Leaflets are sensitive to touch; stems with appressed pubescence" (Ilpin). ③Leaflets 8-12 pairs, flowers large, pedicillate, anthers 10 (w73).

Comments: status: This plant is considered invasive in some parts of the United States (Haragan 1991, Stubbendieck et al 1994, SWSS 1998). phenology: Blooms July to September. C3. In northern Illinois, collect seeds in mid-September - October. Collect seeds in se Wisconsin in September - October (he99). Warm-season forb with showy yellow flowers, followed by attractive dried seedpods. Good in the landscaping, good for soil building, prairie restorations, wildlife plantings, pollinator gardens, honey production, & roadside plantings. Seeds are in pea-like pods that forcibly expel the seeds when ripe. This sp can be aggressive in restorations, do not overuse, but it is quite attractive in masses, perhaps heavily spot seed high profile areas. With dormant seed, sp may take several years to manifest. Seed source nursery production, genetic source Clinton Twp, DeKalb Co & commercial sources.

"Other common plants, which presented themselves at different places on our route through the prairies" *Chamaecrista fasciculata* (Michx) Greene *(Cassia fasciculata* Michx*)* as *Cassia chamaecrista* Short (1845), &c, ––non (L.) (Short 1845).

"The leaves possess considerable irritability" (w73).

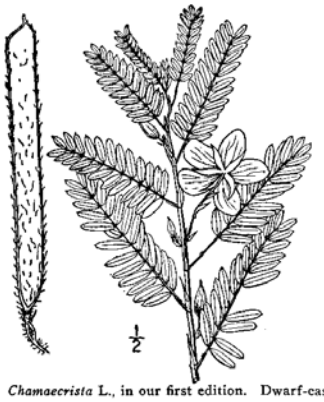
Associates: Attracts bees, good honey plant with nectaries available before it flowers. Larval host for GRAY HAIRSTREAK, ORANGE/COMMON SULFUR, & CLOUDLESS SULFUR; *Colias philodice* CLOUDED SULFUR, & *Eurema (Pyrisitia) lisa* LITTLE YELLOW.

Said to be good wildlife food, attracts upland game birds & songbirds, nutritious seeds, food & cover for upland game birds. It is rated low to moderate food value for upland birds, & minor to low food values for large mammals. Its value for cover is minor.

Nodulating & nitrogen fixing.

VHFS: Formerly *Cassia fasciculata* Michaux. This sp is also referred as *Cassia Chamaecrista* Linnaeus. Variety *macrosperma* (Fernald) CF Reed, MARSH WILD SENNA, is endangered in Maryland. Ours is variety *fasciculata,* which has about twenty-one synonyms (see plants.usda.gov for a list).

Chamaecrista fasciculàta (Michx.) Greene. Partridge Pea. Large-flowered Sensitive Pea. Prairie Senna.



Cassia fasciculata Michx. Fl. Bor. Am. 1: 262. 1803.
Cassia Chamaecrista robusta Pollard, Mem. Torr. Club 21: 218. 1894.
Chamaecrista fascicularis Greene, Pittonia 3: 242. 1897.
C. fasciculata Greene; Pollard in Small, Fl. SE. U. S. 587. 1903.

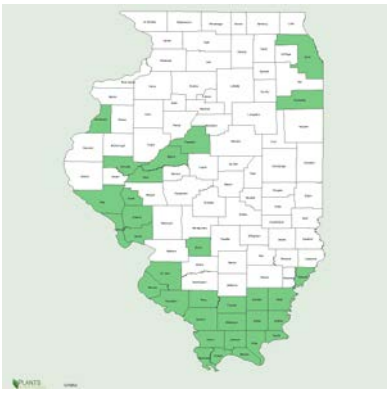
Annual, erect or spreading, widely branched, pubescent, with spreading hairs, or nearly glabrous, 1°–2½° high. Stipules subulate-linear, persistent; leaves petioled, with a sessile gland on the petiole, sensitive; flowers 2–4 together in the axils, 1′–1½′ broad, slender-pedicelled, showy, some of the petals often purple spotted; leaflets 20–30, linear-oblong or the upper lanceolate, obtuse, mucronate, inequilateral, oblique at the base, 4″–10″ long, 1½″–2″ wide; calyx-lobes long-acuminate; stamens 10, all perfect, 4 of the anthers yellow, 6 purple; pod linear, pubescent or glabrate, 1½′–2½′ long, 2″–3″ wide.

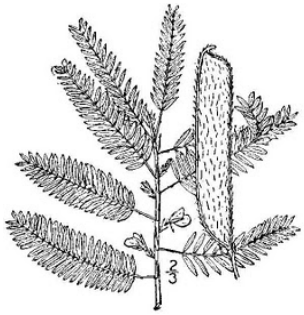
In dry soil, Massachusetts to Florida, Minnesota, Texas and Mexico. Referred to *Cassia Chamaecrista* L., in our first edition. Dwarf-cassia. Magoty-boy-bean. July–Sept.

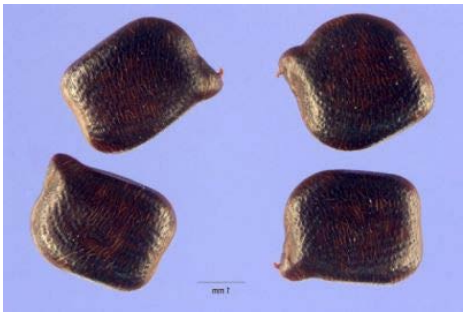
Chamaecrista fasciculata

Illinois map courtesy plants.usda.gov.

Chamaecrista nictitans (Linnaeus) Moench subsp **nictitans** var **nictitans**
*NH PARTRIDGE PEA, aka COMMON SENSITIVE PLANT, SENSITIVE PARTRIDGE PEA, WILD SENSITIVE-PLANT, (*nictitans* blinking, moving, nodding, drooping, from Latin *nictāre,* to wink or blink, in reference to the sensitive leaves.)
In the southeastern US, forests, woodlands, disturbed areas, & pine savannas (w10).
key features: Leaflets 6-15 pairs, flowers small, 2-3 in each subsessile fascicle, stamens 5, sub equal (w73).
Endangered in New Hampshire. Leaves are quite sensitive, closing by night and when touched (w73).
VHFS: Formerly *Cassia nictitans* L.

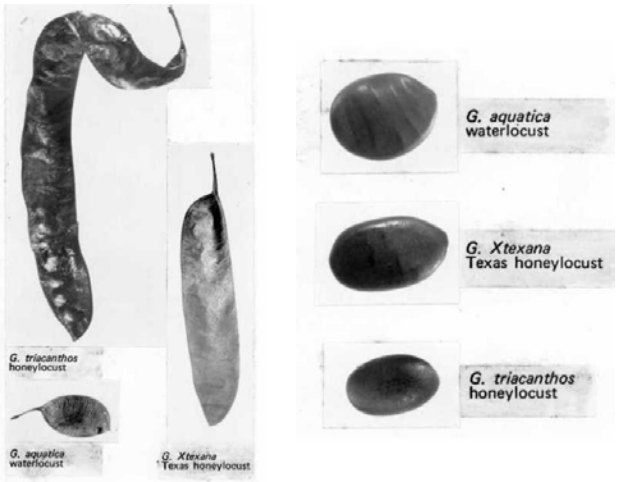






Chamaecrista nictitans
Line drawings Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov.

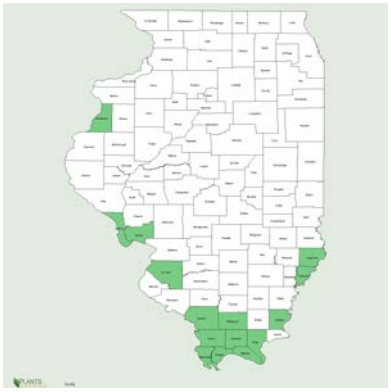
GLEDITSIA Linnaeus 1753 **HONEY LOCUST, WATER LOCUST** *Caesalpiniaceae Gleditsia* (gle-DITS-ee-a) Modern Latin after Johann Gottlieb *Gleditsch* (1714 - 1786), of Leipzig, German botanist, writer, director of the Berlin Botanical gardens, & contemporary of Linnaeus. Wood (1864, 1872) gives his first name as John, but with a middle name of Gottleib, … Occasionally seen as *Gleditzia* or *Gleditschia* (*op. cit*., & oed). Deciduous trees, about 12 (16) spp relictually distributed in North & South America, Iran, India & eastern Asia. In eastern North America, two tree spp & one hybrid, with compound leaves & flowers in compact racemes. Fruits are legumes, continuous, compressed, often with sweet pulp between the seeds. Most spp are heavily armored with large thorns & 10 other spp have pulpy pods like *G triacanthos*. Fossils of this genus have been found in North America from the Oligocene, 23-35 million years ago. Related to *Gymnocladus. G sinensis* (formerly *G horrida*) has many traditional medicinal uses (2n = 28). The seeds of *G japonica* are said to be comestible when husked & cooked (2n = 28).



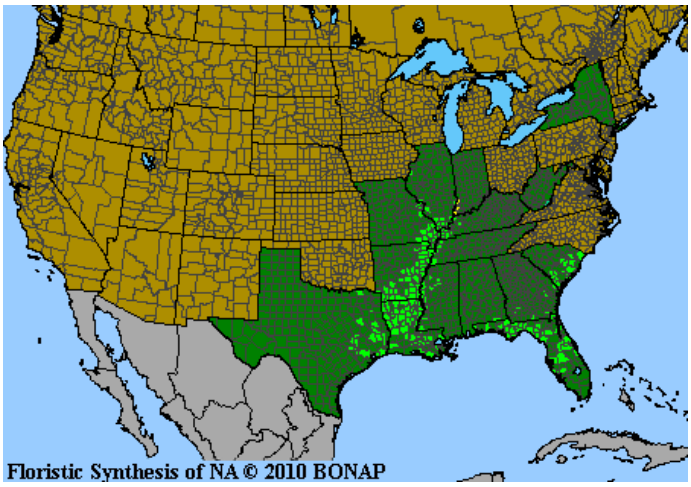
Photos USDA-NRCS PLANTS Database - Not copyrighted images.

Eaton (1829) lists *G brachycarpa,* with spines thick, short, subternate; leaflets oblong, obtuse; legumes short-oblong.

"The purple pods cling & rattle in the wind long after the yellow leaves have fallen. One by one, they are torn off, their S-curves tempting every vagrant breeze to give them a lift. On the crusty surfaces of snowbanks & icy ponds, they are whirled along & finally lodge, to rot & liberate the seeds. It takes much soaking to prepare the adamantine seeds for sprouting. The planter scalds his seeds to hasten the process. Nature soaks, freezes, thaws them, & thus the range of the honey locust is extended." Julia Ellen Rogers (Trees Worth Knowing, 1917, p 180), in Barlow, 2000, Ghosts of Evolution.



Gleditsia aquatica Marsh *IN, KY WATER LOCUST, aka SWAMP LOCUST, WATER-LOCUST, WATER LOCUST,
The common & scientific names refer to the sp habitat.
Wet soils of riverbanks, flood plains, & swamps, especially where submerged for long periods; in floodplain forests; bayous & sloughs. Common in bottom lands in the same habitat as HONEY LOCUST.
distribution/range: Rare in Illinois. Southern Illinois primarily along the Mississippi, Ohio, & Wabash Rivers, also in Henderson Co.
Description: Native deciduous tree, small to medium, 60-80', spiny tree with short trunk & broad, flattened crown of spreading branches; key features: ①Very similar to *G. triacanthos*; distinguished by short fruit pods with 1(-2 or 3) seeds. ② "Sp has slender thorns; pods are short, oval without pulp" (Ilpin). ③Armed with few, slender, mostly simple spines, legume without pulp, one seeded (Wood73).
Comments: status Endangered in Indiana. Special Concern in Kentucky. phenology: Blooms 5-6. C3.
The wood fluoresces pale yellow under ultraviolet lights.
VHFS: [*Gleditschia monosperma* Walt. as in Wood 1873.]
Gleditsia ×texana Sarg, TEXAS HONEYLOCUST is intermediate between HONEY LOCUST & WATER LOCUST & is known in the lower Mississippi River Valley, Florida, Indiana, South Carolina, & Texas.



Gleditsia aquatica with pod photo of *G. X texana*

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. Pod photos USDA-NRCS PLANTS Database - Not copyrighted images. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Gleditsia triacanthos Linnaeus HONEY LOCUST, aka COMMON HONEY LOCUST, HONEYSHUCK, SWEET BEAN, SWEET LOCUST, THREE-THORNED-ACACIA, THORN TREE, THORNY LOCUST, (*triacanthos* (tree-a-KANTH-os) with three thorns, three-spined or thorned, from Latin *tri,* three, & Greek ακανθος, *akanthos*, spiny, thorny; or *acantha,* a thorn or thistle, referring to the often thrice-branched thorns.) The common names refer to the prominent thorns on the trunk or the sweet pulp in the pods. The term locust is similar to the New Testament locust pods, or carob pods eaten by John the Baptist.

Habitat: Moist, wooded ravines, thickets, roadsides, & edges of fields. A pioneering sp usually found in overgrown pastures, fence lines, & wood lot edges. Commonly found in upland areas along river drainages. Riverine forest associations. "Common in rich moist soils of lowlands" (Sibley). Bottomland forests that experience fires infrequently. The floodplain habitat may be due to the lack of a dispersal partner that effectively moves the seeds uphill, & gravity & flotation are the current predominant dispersal methods.
distribution/range: Native to part of the central United States. In almost every Illinois co. Widely planted, established, & naturalized beyond its native range in the US. "Native distribution is believed to be from western New York west to southeast South Dakota, south to Panhandle Florida & Texas (west of the Blue Ridge); its occurrence over much of our region appears to be as an adventive" (w11). Sp originally inhabited prairie openings in midcontinent woodlands from Michigan to Texas. At the time of white settlement, it may have been still expanding its range from its restriction during the last glacial advance, but it was trying to move without its former prime dispersal agent(s). It is established in Europe & New Zealand, & has become a weedy pest in Australia, South Africa, & Chile.

Culture: ①Sp is commonly dispersed by animals that have consumed the seeds & passed the seeds through their digestive tract. Seeds must be scarified, either by concentrated sulfuric acid for 1-2 hours, by hot water soaking (180ºF, 82ºC), or by mechanical means. Some growers recommend feeding the pods to cattle to effectively scarify the seed, & then gleaning the seeds from the cowpies. "This can be imitated by scarifying the seed mechanically or by using an acid bath. Seeds soaked in hot water (85-90^{o}C) & allowed to cool to room temperature have also germinated well. Seed that has been treated with these methods can be planted into a well-prepared seedbed or container, approximately ½ inch deep. Seedlings should be strong enough for transplanting at one year of age." (usda plant fact sheet) ②"Scarified seeds will germinate readily. Thornless forms come true about half of the time. Scarify seeds in a concentrated sulfuric acid for 1-2 hours." (lbj) ③"Seeds exhibit physical dormancy. Seeds germinate at 30/20º C. Germination was equal in light & dark." (bb02) Unscarified seed may germinate in the 2nd or 3rd spring after planting. Growth rate rapid. Seedling vigor medium. Vegetative spread rate none. Seed spread rate slow. 2800 (usda) seeds per pound. Trees are routinely available commercially.

asexual propagation: Root cuttings have been used successfully. Can be propagated by grafting, budding, & cuttings (hardwood, softwood, & root cuttings). Cuttings from male-flowered branches grow into trees with pollen flowers only, so they do not produce fruit (lbj). Cultivars are bud grafted.

cultivation: Tolerant of fine & medium textured soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement medium. Fire tolerance medium. Rated highly tolerant of flooding. Salinity tolerance medium. Shade intolerant. (*These tolerances do not sound like those of a floodplain sp! Drought tolerant, no anaerobic tolerance! They sound like a sp whose seeds have been falling & washed down slope for 12,000 years.*) pH 4.8-8.0. Zones 5-8 (or 4-9). Will grow in a range of soils, both wet & dry soils at a range of pH, but prefers deep, moist, fertile alluvial soils of neutral pH. Growth is best if the soil is of limestone origin, not as good soils that are not too acidic. Best at pH of 6.0-8.0. Handles the calcium from concrete, road salt, high summer heat, urban pollution, & soil compaction. Transplants easily. Requires full sun, will not grow in shade. Once established, trees are generally maintenance free. Pruning lower limbs encourages upright growth.

Description: Native deciduous tree, medium to large, 30-75(-116)', with comparable spread, having a delicate silhouette & good horizontal lines in the branch pattern, branching upright-spreading to arching or more or less horizontal, some trees are nearly flat-topped, rather loose & open, others may be oval crowned, casting only light shade, develops a short main trunk, distinctive long twigs spreading from the crown; younger trunks dark gray brown, with a reddish or orange tone, smooth, with pale, horizontal lenticles, older trunks with bark dark gray-brown & black with deep fissures forming elongate plates peeling from the sides, separated by furrows, rather attractive; lower main trunk, lower branches, & shallow roots can have large, strong, cross-branching, thorns, to 3.0" or more, with 3 or more branches, thorns at first red, then fading to brown then gray, some cultivars are thornless, some wild specimens may by wickedly, profusely spined; twigs stout, zigzag, tapered, winter twigs zigzag with many small knobs; wood is dense, hard, strong, stiff; leaves pinnate, 6-8" long, 9-14 (13-30) pairs of leaflets, alternate, dark green, glossy, leaflets each 1.0" long, occasional scattered leaves are bipinnate with numerous subleaflets, leafs out in late spring, leaves form an arched cluster at branch tips; fall color a showy, clear yellow (pale to golden yellow), leaves may become dry, orange brown by late summer, but typically dropping early; inflorescences along branches, monoecious, male & female flowers on separate trees, male flowers tight racemes, female flowers loose racemes, blooms as or after leaves appear; flowers small, showy (or inconspicuous) white to yellow-green, pea-like, blooms in May & June, fragrant, not a major ornamental feature; pods long, flat, becoming twisted, strap-like, many-seeded, green in summer, ripening to dark reddish-brown, woody, highly variable in size, 8-16(-18)" long, 1.0" wide persisting through most of winter, seeds are separated about 1.0" by sweetish pulp, with a strong, sweet aroma when ripe, some cultivars are fruitless, fruits can be numerous & messy; N 2n = 28. key features: ①Wild trees are easily recognized by the large, branched thorns on the trunk. ②"Sp is usually thorny; pulp surrounding the seeds; elongate pods" (Ilpin) ③"Pinnate & bipinnately compound leaves, upright-spreading, arching or horizontal branching, short main trunk, large thorns on trunk & branches, large flat, twisted pods" (uconn) ④Branches armed with stout, triple spines; legume intervals filled with sweet pulp (Wood).

Comments: status: May be weedy or invasive. phenology: Flowering starts May 10th in southern part of its range & June 25th in the northern part. C3. Legumes ripen September to October, & slowly drop throughout the late fall & winter. In 2011, the pods were brown the first week of October. HONEY LOCUSTS are usually self-sterile. Wild specimens are usually armed with thorns. Sp has potential as a biofuel, with rapid growth,

aggressive re-sprouting, & a high-density wood. It has also been planted as a high-protein mast for livestock, with the open shade also allowing good growth of a pasture grass understory. Sp is aggressive & if left unchecked, & may come to dominate a site. Intolerant of fire due to thin bark, spread may be controlled by timely, periodic burning, or with herbiciding. Cutting young trees causes excessive re-sprouting from stumps & roots. Stumps of cut trees must be treated with herbicide.

Widely used in landscaping as a lawn tree or street tree where space permits, & planted for erosion control; perhaps overused as an elm substitute. Its use should possibly be moderated in light of past overuse & an impending urban monoculture of honey locust. Very useful for the light shade that permits turf to grow beneath the tree. Thornless & fruitless varieties are available; some varieties have smaller pods that many people think are 'trashy'. Trees are fast growing, long-lived, very hardy, & used in parking lot islands & as street trees. Salt-, drought-, heat-, & high pH-tolerant. The short trunk, open, spreading canopy & small leaves combine to produce a filtered shade that allows turf or other landscaping under this sp. Flowers are interesting & attractive but not ornamental, very seldom noticed. They are difficult to see until one learns to look for them. Amazingly small sized flower for the size pods they produce. Some individuals have an attractive, strong, horizontal branch pattern, with a winter silhouette that evokes an image of the dry season on the Serengeti. Established trees mat put on 6' of leader on a sand dune! The large thorns can be dangerous; pods can be a 'trashy' issue to some.

"A common native tree that was formerly used in hedge making. One half mile west of New Milford is such a large old hedge." (ewf55)

Sp begins bearing seed at about 10 years. Large seed crops are produced every other year, with some seed produced every year. Along John Deere Expressway, north side, near JD World Headquarters is a roadside planting of honey locusts, apparently from one source, one lot. All but one tree are male & mostly of uniform size. The lone female tree is noticeably smaller than the males. Is this the cost of seed production, putting so many resources into flowers, pods, & seeds that it dwarfs the female? Is this observable in other GLETRI plantings, or in other dioecious tree sp?

Associates: HONEY LOCUST is an anachronistic sp. In the wild, the trunk is often armored with numerous, large thorns. The large thorns & their location on shallow roots & on the trunk & main branches to about 15 feet above ground are thought to be a protective adaptation to mammoths. The pods are on upper thornless branches. The pods were easily reached while on the tree & the seeds dispersed by mammoths, while the thorns kept the mammoths from eating the nutritious bark & killing the tree. No extant animal in North America native to the home range of honey locust can swallow the whole 'fruit' or legume of this sp. Mammoths were capable of putting the whole pod in their mouth. The pods were briefly masticated & many seeds were swallowed a little abraded but sound. A *Gleditsia* seed that was deposited in a pile of mammoth dung had a great start in life. The tough seed coat seems to be an adaptation to the mastication & digestive system of a large animal. Compare *Gleditsia* dates with mammoth dates, *Gleditsia* fossil records, illustrating by necessity different mammal partners over geologic time.

This sp exhibits the "rotting fruit syndrome". The base of female trees is littered with pods, slowly rotting, perhaps a few partially chewed by small mammals. Between the seeds, the pods contain a rich, sweet edible pulp, a reward to any animal eating the pod. No extant animal in North America native to the 'home range' of *Gleditsia triacanthos* can swallow the whole 'fruit' or legume of this sp. *G. triacanthos* formerly partnered with a series of large mammals capable of putting the whole pod in their mouth. The fruit & seed ecology of *Gleditsia* & *Gymnocladus* are very similar.

At least some pods persist on the trees into winter, & when dropped, may be blown some distance on ice or crusted snow by winter winds.

Flowers attract many pollinators; a source of pollen & nectar for honeybees & butterflies. *Gleditsia triacanthos* is a larval host for *Epargyreus clarus* SILVER-SPOTTED SKIPPER, *Sphingicampa bicolor* BICOLORED HONEY LOCUST MOTh, & *Sphingicampa bisecta* BISECTED HONEY LOCUST MOTH. Sp can form dense, thorny thickets that provide cover for variety of game animals & birds. Pods & seeds are eaten by quail (inc northern bobwhite), crows, starlings, eastern gray squirrels, fox squirrels, rabbits, opossums, raccoons, whitetail deer, hogs, sheep, goats, & cattle. Rabbits eat bark in winter. Cattle eat pods but do not digest the seeds. Sheep digest the seeds. Deer, cattle, & sheep will eat tender new shoots in spring & bark of young trees in winter. USDA says no N2 fixation or nodules. Few significant pests. HONEY LOCUST is host to spider mites, white marked tussock moth, honey-locust plant bug, Mimosa webworm, bagworms, pod gall midge, & other pests. A number of cankers may be problematic, occasionally fatal.

ethnobotany: Pulp surrounding seeds is edible & sweet. Native Americans dried the pulp for use as a sweetening agent & a minor food item. The pulp eventually becomes sour. Some parts of the plant were used medicinally. Thorns are capable of causing flat tires on equipment or puncturing shoes. The thorns cause wounds that are slow to heal.

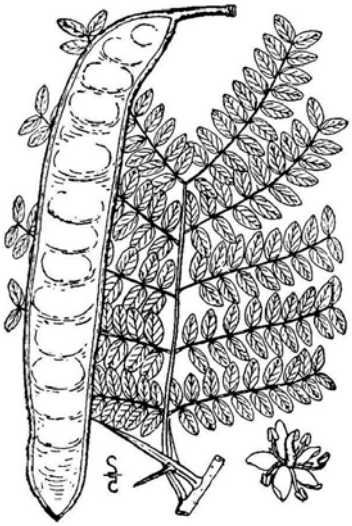
The wood is a durable, self-bow wood used by Native Americans & traditional/primitive archers, & the thorns were occasionally used as arrow points. The wood is dense, hard, strong, stiff, shock resistant, easily split, can be worked to a high luster, durable in ground contact, & is used for fence posts, railroad ties, furniture, pallets, general construction, tool handles, & firewood. The wood fluoresces bright yellow under ultraviolet lights.

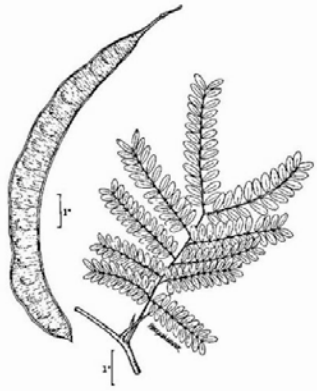
VHFS: [*Caesalpiniodes triacanthum* (L) Kuntze, *Calliandra inermis* (L) Druce, *Gleditsia inermis* L, *G triacanthos* L f *inermis* (L) Zabel, *G triacanthos* L var *inermis* (L) Castigl] Natural hybrids between honey locust & water-locust (*G. aquatica*) have been reported.

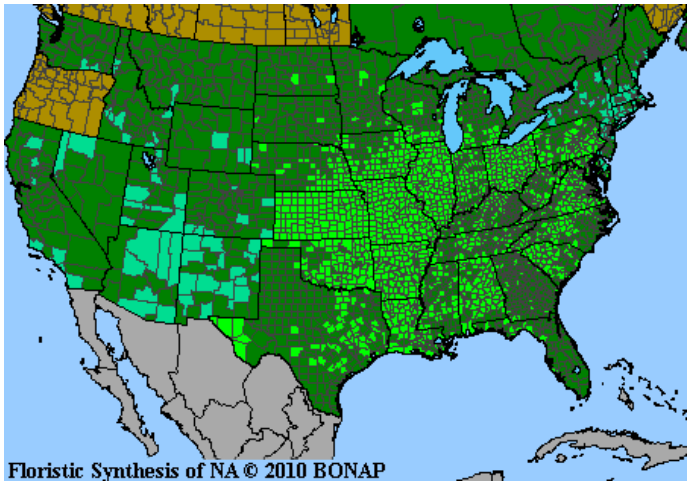
Many cultivars are known, having been selected for thornlessness, fruitlessness, silhouette, foliage color, canker resistance, & cold hardiness. They are almost all selected from the naturally occurring *G triacanthos* var *inermis*. Popular cultivar 'GOLDEN HONEYLOCUST' has emerging leaves pale yellow.

CC Baskin, & JM Baskin, 2002. Propagation protocol for production of container *Gleditsia triacanthos* L plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 19 May 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

J Sullivan, 1994. *Gleditsia triacanthos*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis [2011, May 19].







Gleditsia triacanthos, pod & thorns

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant spp*. Not copyrighted image. Pod photo USDA-NRCS PLANTS Database. - Not copyrighted image. Thorn photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

ROTTING FRUIT SYNDROME, aka **PLEISTOCENE ORPHANS**

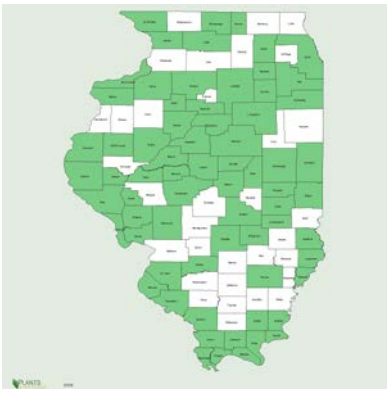
Nature does not frivolously expend resources that are under utilized, or are not utilized at all. Never the less, some tree species produce abundant fruit that falls beneath the mother tree, the vast majority simply rotting. These trees & their fruits evolved with a long series of vertebrate ecological cohorts, the latest of which no longer exists within the range of the tree. These ecological cohorts coevolved with our flora through the Cenozoic.

Many were megafauna, or animals over 100 pounds. The latest partners vanished about 12,000 to 13,000 years ago. Those missing partners consumed the fruits & dispersed the seeds away from the mother plant. In the Midwest, these trees include *Gleditsia triacanthos, Gymnocladus dioicus*, & *Maclura pomifera*.

Gleditsia triacanthos & the "Rotting fruit syndrome"

GYMNOCLADUS Lamark 1785 **KENTUCKY COFFEE-TREE** *Caesalpiniaceae Gymnocladus* (gim-NO-kla-dus) from the combining form of Greek γυμνός, *gymnos,* naked, bare & κλάδος, *klados,* a branch, a shoot, referring to the deciduous nature. This is perhaps a reference to the primitive, open, naked, winter branch structure (as noted in Wood 1864) 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 spp of deciduous trees, with a relictual distribution, 1 in eastern North America & 4 spp in eastern Asia. Primitively branched trees with bipinnate leaves; flowers in loose panicles, dioecious, fruit is a legume, 1-celled, oblong, very large, pulpy within. Related to *Gleditsia.*

Gymnocladus dioicus (Linnaeus) K Koch ☠ *NY, WI KENTUCKY COFFEETREE, aka AMERICAN COFFEE BEAN, AMERICAN COFFEE BERRY, AMERICAN MAHOGANY, *CHICO DU CANADA, CHICOT, CHIOT, CHIOT* TREE, COFFEEBEAN, COFFEEBEAN TREE, COFFEENUT, COFFEE-NUT TREE, COFFEE TREE, DEAD TREE, *GEWEIHBAUM,* KENTUCKY MAHOGANY, LUCK BEAN, MAHOGANY, MAHOGANY-BEAN, NETTLE TREE, NICKER TREE, NICKER TREET, STUMP TREE, (*dioicus -a -um* (dee-o-EE-kus) of two houses, from Greek δις-οικος, *dis-oikos*, dioecious, indicating that the male & female flowers are found on different plants, having stamens & pistils on separate flowers on different plants.) The specific epithet is seen as *dioicus* or *dioica*.



Habitat: Bottomland woods; floodplains & river valleys. Alluvial soils of river & flood plains & nearby terraces. "Common in deep, rich soils in bottomlands" (Sibley). distribution/range Native to the eastern & central United States; scattered or rare in the wild, not common in any part of its native range. The trees natural presence is sometimes an indicator of limestone or calcareous soils. Some naturalized populations may be associated with prehistoric Native American habitation sites. Native Americans expanded the range of this sp. A killer KENTUCKY COFFEETREE savanna is known from the bluffs of the Illinois River, near the Santa Fe railroad south of Lacon, & a large population grows along the railroad north of Chillicothe. Known from very old IDOT plantings in Bureau Co.

Culture: ①Cold stratification not required (usda). ②"Seeds exhibit physical dormancy. Seeds germinate at greenhouse temperatures." (bb02) ③"Reproduce with root cuttings or scarified seed. Scarify in concentrated sulfuric acid for 4-6 hours. For small quantities of seed, filing through the outer seed coat with a hand file will give satisfactory results." (lbj) Growth rate slow. Seedling vigor medium. Vegetative spread rate slow. Seed spread rate slow. 230 (usda) seeds per pound. Commercial availability is good to hard to find.

asexual propagation: Root cuttings for selections.

cultivation: Tolerant of fine, medium, & coarse textured soils. Anaerobic tolerance none, but said to tolerate occasional flooding. CaCO3 tolerance ? Drought tolerance medium. Fertility requirement low. Fire tolerance none to low. Salinity tolerance medium. Shade intolerant (to tolerant?). Tolerant of pollution. pH 6.0-8.0, or 6.8-7.2. Optimum pH 7.0. Zones (3-)4-8. Plant seedlings in the field after 1 year. Transplant B&B trees into deep, rich, moist soil for best growth. Prefers full sun & deep, humus rich, moist soil for best growth. Fast growing when young & moderate to slow as tree ages, 12-14' in 10 years. Fertilize for woody growth only. Prune in winter or early spring. Prune when young to produce a strong structure.

Description: Coarse-branched, native deciduous tree, medium to large, 60 to 85(-135)', spread 40-50', silhouette obovate; trunk short, 1-2' diameter, upright to irregular branching, large branches ending in slightly contorted twigs; roots fibrous, minimum depth 36", may be found in small clusters due to root sprouting; bark of young trunks pale gray, in long shallow ridges with orange furrows, older trunks bark thick, dark gray to grayish brown, rough-looking, narrow scaly ridges & furrowed with unique flaky, curly plates or scales; twigs very stout, greenish to orange, buds tiny, winter twigs stout, untidy, upright, with some retaining curves stalks & pods; wood is coarse-grained, light-brown to reddish-brown, strong, heavy; leaves are the largest of any native sp, 1-3' long by 1.5-2.0' wide, twice compound, 5-9 pairs of pinnae, 6-14 entire, more or less ovate (almond shaped) subleaflets, 2-3 inches long, very lacy texture when in leaf, color dark green or blue-green, underleaf pale green late to leaf out in spring; newly emerging leaves are tinged with pink; fall color inconsistent but sometimes a good golden yellow; inflorescence terminal clusters of large panicles, females 8.0" to 12" long & males 3.0-4.0" long, on 4" spikes; flowers dioecious, with male & female plants, small, greenish-white (whitish) 0.75-1.0" long, in May, fragrant; female trees have thick, very stout, orange brown becoming black to dark-reddish (purplish) brown pods, 4.0-8.0(-10)" long, 1.5-2.0" wide, leathery texture, hanging into winter or spring; very hard seeds inside. (*G. chinensis* 2n = 28*). key features: "Sp has large bipinnately compound leaves, without small twigs" (Ilpin). "Large tree; coarse branching; rough gray bark; stout twigs; buds embedded in wood, barely visible through a small "belly button"-like opening; bud considerably above the leaf scar; female plants with large, chunky pods; large heart-shaped leaf scars." (UConn)

"There are occasional trees in Pecatonica River bottom near Trask Bridge & 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 Co." (ewf55)

Comments: status: Endangered in New York. Special Concern in Wisconsin. Threatened by Canada's Spp at Risk Act. Sp numbers may be declining due to overharvesting & populations should be monitored. Now a rare component of any woodland. phenology: Blooms (4-)5(-6). C3. The destitute branch pattern gave rise to the French Canadian name *Chicot,* the dead tree, but the primitive pattern is picturesque in winter. Single leaflets often occupy the place of some of the pinnae.

Often planted for its unique appearance & character in parks & landscape plantings. At one time planted on many state roadsides, including I-80, in northwest Illinois by IDOT, with many of these specimens show suckering. Sp can be identified at 55 mph by the open cluster of robust, unbranched suckers that often survive in linear patterns in old fencerows where they were not mowed. All of these specimens are threatened by agriculture & road construction. Formerly planted around farms. Tolerates urban conditions. Planted as a lawn tree or shade tree in parks & golf courses. Good street tree. Leaves appear late & drop early. Ideal for urban shade where winter sun is desired. Planted on mine spoils for soil reclamation & stabilization. Pest-free tree with no serious problems, sp is an alternative to ash & elm. Light, filtered shade allows healthy turf below. Leaf stalks (rachis) & pods may be a nuisance & require cleanup in fall. In the wild, fruits accumulate at the base of female trees. Occasional root suckers should be pulled. The wood may be somewhat brittle.

Very limited curbside evidence suggests this sp may exhibit sexual dimorphism. We have only two examples of an isolated male & female tree growing near each other. The female trees are noticeably smaller than the males. Is this another example of phyto-sexual dimorphism, or the cost of seed production, putting so many resources into flowers, pods, & seeds that it dwarfs the female? Or, is it a side effect of the rotting fruit syndrome, & with dwarfing caused by toxins from decaying pods & seeds?

The wood fluoresces deep, bright yellow under ultraviolet light.

Associates: Tree used by nesting birds. As leaves & raw seeds are toxic to extant animals, it is of little food value. ☠ Poisonous to livestock, humans, & pets. Livestock should not be allowed to graze near COFFEE TREES, their sprouts, or fallen pods. N_2 fixation low or no nodules formed. *Gymnocladus dioicus* is a larval host for

Sphingicampa bicolor BICOLORED HONEY LOCUST MOTH, & *Sphingicampa bisecta* BISECTED HONEY LOCUST MOTH.

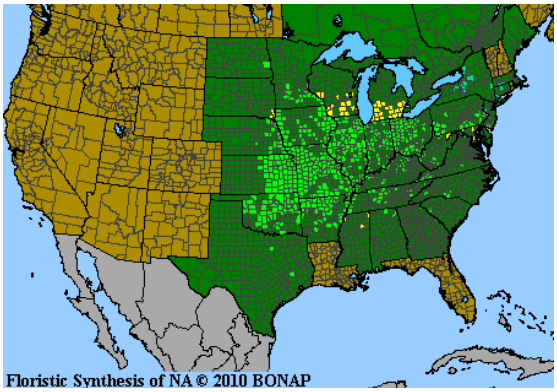
This sp also exhibits the "rotting fruit syndrome". The base of female trees is littered with pods, slowly rotting, perhaps a few partially chewed by small mammals. Between the seeds, the pods contain a rich, sweet, edible (?) pulp, a reward to any animal eating the pod. No extant animal in North America native to the 'home range' of *Gymnocladus* can swallow the whole 'fruit' or legume of this sp. *Gymnocladus* formerly partnered with a series of large mammals capable of putting the whole pod in their mouth, & dispersing the seeds.

Ethnobotany: Native Americans used the seeds for gaming pieces. Pulp (*also called wax*) from the pod was used to treat insanity. Some sources cite the pulp as poisonous. A tea was made from the leaves & pulp & used as a laxative. (wood pulp or pod pulp?) Settlers used beans as a coffee substitute, said to be a very inferior substitute for coffee. ☠ The beans contain the toxin cysticine (cytosine?), & are poisonous in quantity. Cysticine is thought to be neutralized in the roasting process.

Wood is coarse-grained, light-brown to reddish-brown, strong, heavy, rot-resistant & used in general construction, cabinetry, bridge timbers, sills, interior finish, fine furniture, railway sleepers, bridge timbers, cross ties, fence posts & rails (staples pull out of soft wood) & fire wood. Lumber is available but not common.
VHFS: [*Guilandina dioica* L, *Gymnocladus canadensis* Lam.] Several 'improved' selections are available, but rare in the trade; they are upright male selections 50'-70' tall, 20'-40' wide, good street trees.

CC Baskin & JM Baskin, 2002. Propagation protocol for production of container *Gymnocladus dioicus* (L) K. Koch plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 20 May 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

Connie Barlow, 2000, The Ghosts of Evolution: Nonsensical Fruit, Missing Partners, & Other Ecological Anachronisms, Basic Books, New York.



Gymnocladus dioicus, fence row sucker, "primitive, naked" branching pattern

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Pod photo USDA-NRCS PLANTS Database. - Not copyrighted image. Fencerow suckers & "primitive" branch pattern. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010).

SENNA P Miller 1754 **SENNA, SICKLEPOD, WILD COFFEE** *Caesalpiniaceae* *Senna* is New Latin from the ancient Arabic name for the plant, *Sana*. A genus of about 295-350 spp of trees, shrubs & herbs mostly of tropics & warm temperate areas. Local spp are yellow flowered herbs, mostly perennials, with the flowers mostly in tight clusters at top of plant. This genus was formerly part of a broadly defined *Cassia*.

A search of Midwestern native *Senna* spp in older texts can be frustrating & confusing.

From the following illustration & description, it appears that *C marilandica* & *C hebecarpa* are confused in Britton & Brown (1913). What they call *C marilandica* is now *C hebecarpa*, & what they call *C medsgeri* is now *C marilandica*.

Cassia marilándica L. Wild or American Senna.

Cassia marilandica L., Sp. Pl. 378. 1753.

Perennial, glabrous or pubescent with a few scattered hairs, 3°–8° high, little branched. Stipules subulate-linear, caducous; leaves petioled, the club-shaped gland borne near the base of the petiole; leaflets 12–20, oblong or lanceolate-oblong, obtuse or obtusish, mucronate, rounded at the base, ciliate, 1′–2′ long, 3″–6″ wide; flowers 7″–9″ broad, numerous in pubescent axillary racemes on the upper part of the plant; calyx-lobes ovate or oblong, obtuse; stamens 10, the upper 3 imperfect; pod linear, flat, pubescent or becoming glabrous, 3′–4′ long, 3″ wide, curved, its segments as long as broad or slightly longer; seeds flat, suborbicular.

In swamps and wet soil, Massachusetts to North Carolina, Ohio and Tennessee. July–Aug.

Line drawing of *C hebecarpa* as *C marilandica* from Britton & Brown (1913).

un-copyrighted draught

This scenario is repeated in the following. "The *Cassia marilandica* of Linnaeus was, as Fernald points out, a mixture of the plants here called *C marilandica* & *C medsgeri,* the specimen in the Linnaean Herbarium being of the latter sp. Fernald accordingly restricts the name *C marilandica* to *C medsgeri,* renaming the *C marilandica o*f recent American authors *C hebecarpa.* But if we consider the *C marilandica* of Linnaeus as a mixture from which *C medsgeri* was segregated, leaving the name *C marilandica* for the remaining element (i. e., applying the "doctrine of residues"), we can perhaps retain the names in the sense in which they have been applied ever since the recognition of the fact that there were two spp." (Fasset 1939)

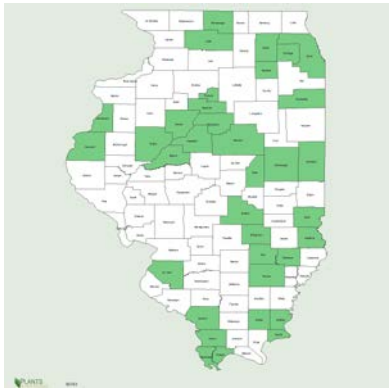
Wood (1873) lists only one perennial Senna, *C. Marilandica* L., American Senna.

This is similar to the old *Carex convoluta-C rosea-C radiata* & the current *Lespedeza violacea-L frutescens-L intermedia-L violacea* switcheroonies.

Senna is reported to have the vibrator or buzz pollination syndrome. Bumblebees shake the anthers by vibrating their thoracic flight muscles at a certain frequency, setting up a resonance in the anthers or the space they enclose which releases the otherwise inaccessible pollen from the terminal pores of the anthers. (Barth 1985, Procter et al 1996).

Senna hebecarpa (Fernald) Irwin & Barneby *CT, MA, NH, RI, VT WILD SENNA, aka AMERICAN SENNA, AMERICAN WILD SENSITIVE-PLANT, NORTHERN WILD SENNA, (*hebecarpus -a -um* fuzzy or pubescent fruited, having fruit covered with downy pubescence, from Greek Ἥβη, *Hebe*, youth, (manhood?), καρπός, *karpos,* fruit, & *–us*, Latinizing suffix.) facw

Habitat: Alluvial communities, fens, & floodplains. Mesic to moist soils, open woods, roadsides, streambanks. In the southeast USA, "Open wet habitats, moist forests" (w11). "Found sparingly in Sugar River bottom at Yale bridge & in Kishwaukee bottom near the mouth of the river." (ewf55)
distribution/range: Not native west of the Mississippi River. Sp also known but not mapped from Whiteside Co.



Culture: ①"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) ②Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ③"No pre-treatment needed. Scarify. Sow seeds just below soil surface at 70ºF & water." (ew12) ④Sow at 20ºC (68ºF), germinates in less than two wks (tchn). 22,400 (pm, pn02, jfn04, ew12), 22,680 (gnh13), 23,960 (gna06), 26,536 (gna06), 28,800 (aes12) seeds per pound.

cultivation: Space plants 1.5-2.0'. Medium soils, full sun to partial shade.

bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed and may strongly benefit or require dormant seeding to establish a good stand, but early spring planting with inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed; but successful inoculation is unlikely. Germ 17.2, 11, 7.0, sd 16.5, r4.0-62 (58)%. Hard 61.8, 63.5, 77, sd 19.3, r25-86 (61)%. Test 20, 20, na, r13-36 days.**

greenhouse/garden: Scarify & moist cold stratify (30 days), inoculate or dormant seed.

Description: Native erect, herbaceous, perennial forb; fibrous roots; stems 2-6' tall, mostly smooth above; leaves evenly once pinnate into 6-10 pairs, stalks usually with a large club- to ovate-shaped gland; inflorescence several, many-flowered clusters (panicle) at the end of the stems; flowers yellow, 5-merous, 0.75"-1.25" wide, stalked, petals slightly unequal, buds nodding; pod not as flat or explosively opening when mature as in the annual sp, but opening gradually in fall, the space around the seeds nearly square; seeds flat, nearly as long as wide; N. key features: ①Petals slightly unequal; inflorescence a terminal panicle; seeds flat, squarish; leaf stalks with club- to ovate-shaped gland. ② "Petals are slightly unequal; 10-20 leaflets; segments of legume are as long as broad" (Ilpin).

Comments: status: Special concern in Connecticut. Endangered in Massachusetts & New Hampshire. Historical in Rhode Island. Threatened in Vermont. phenology: Plants emerge late spring. Blooms 7-8. C3. Attractive cut flowers & dried seed heads. Seed source nursery production, genetic source Kane Co (Horlock) & Spring Slough, Montmorency Twp, eastern Whiteside Co.

Bob Horlock was Seedsman for The Natural Garden in the 1980s & early 1990s, & a pioneer in this industry. We were fortunate to have a friendly business relationship with Bob during the early years of our nursery. Bob's seeds were collected in DuPage, Kane, & Will Cos. We traded back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.

"Other common plants, which presented themselves at different places on our route through the prairies." *Senna hebecarpa* (Fern.) Irwin & Barneby *(Cassia hebecarpa* Fern*.) as Cassia marilandica* sensu Michaux (1803), --non (L.).

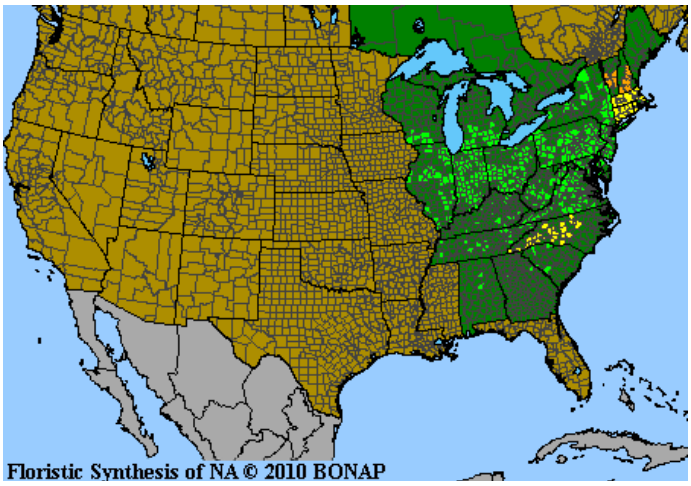
Clusters of showy yellow flowers with chocolate anthers, more attractive in bloom than the next sp. Contrary to the Freckmann Herbarium website, the pods are not very flat & tend to split when ripe, but not to the extent of *C fasciculata*. Seeds are squarish compared to the 'teardrop' shaped seeds of *S. marilandica.*

Associates: A production field of this sp draws an impressive number of bumblebees & other native bees. *S. hebecarpa* flower petals are damaged by Japanese Beetles.

VHFS: Formerly called *Cassia hebecarpa* Fernald. [*Cassia hebecarpa* Fern, *Cassia hebecarpa* Fern var *longipila* EL Braun, *Senna hebecarpa* (Fern) HS Irwin & Barneby var *longipila* (EL Braun) CF Reed]





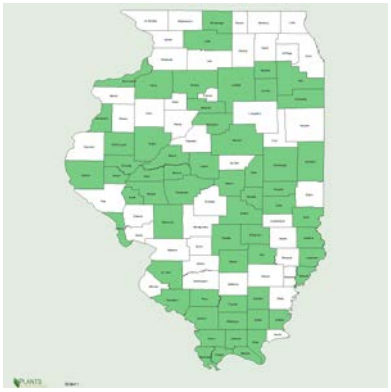


Senna hebecarpa

Line drawings Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010).

un-copyrighted draught

Senna marilandica (Linnaeus) Link *WI MARYLAND SENNA, aka SOUTHERN WILD SENNA, WILD SENNA, (*marilandicus -a -um* (ma-ra-LAND-I-kus) of Maryland, referring to Maryland. The epithet was formerly capitalized.) facw



Habitat: Woodland edges, fens, & streamsides. Dry-mesic to wet-mesic prairies & savannas. distribution/range: Sp is known but not mapped from Whiteside Co.

Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②"No pre-treatment needed. Scarify. Sow seeds just below soil surface at 70F & water." (ew12) ③Scarify seed, then sow at 20ºC (68ºF), germinates in less than two wks (tchn). Seed laboratories may use a 10 day prechill before germination tests. Growth rate rapid. Seedling vigor high. Vegetative spread rate none. 20,000 to 20,500 (usda); 20,618 (gnh11); 21,000 (ecs); 21,083 (gnh13); 27,200 (pm02, ew12); 29,454 (gnh11) seeds per pound.

cultivation: Space plants 1.5-2.0'. Mesic soils, full sun to partial shade. Tolerant of coarse & 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.

bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed and may strongly benefit or require dormant seeding to establish a good stand, but early spring planting with inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed; but successful inoculation is unlikely. Germ 4.1, 4.0, 4.0, sd 0.3, r1.0-7.0 (6.0)%. Dorm 67.7, 69, na, sd 23.2, r29-92 (63)%. Test 21, 22, na, r13-29 days. (#7).**

greenhouse/garden: Scarify & moist cold stratify 10 days, inoculate or dormant seed.

Description: Erect, herbaceous, perennial, native forb (subshrub); 12" minimum root depth; stems 2.0-5.0'; leaves pinnately divided into usually 4-8 pairs of leaflets; clusters of showy yellow flowers with chocolate anthers; pods do not split when ripe, & may remain on old stalks into the following spring; seeds are tear-shaped. key features: "Pods with seeds about 2 times as wide (???) as long" (fh). "Flowers are almost regular; leaflets 10-20; segments of legume are much shorter than broad" (Ilpin).

Comments: status: Special Concern in Wisconsin. phenology: Blooms 7-8. C3. In northern Illinois, collect seeds in late September - October. Collect seeds in se Wisconsin in October (he99). Attractive dried seed heads. Once thought to be non-nodulating? Our more common *Senna*. The dried seedpod clusters of this sp are more attractive than the previous sp. Pods remain intact & on the stem through the winter & into spring (June). This trait is an indication MARYLAND SENNA seeds tolerate dry storage. Genetic source Spring Slough, Montmorency Twp, Whiteside Co.

VHFS: Formerly known as *Cassia marilandica* Linnaeus. [*Cassia marilandica* L, *C medsgeri* Shafer, *Ditremexa marilandica* (L) Britt & Rose, *D medsgeri* (Shafer) Britt & Rose.]


Senna marilandica

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant spp*. Not copyrighted image.

In the midst of the word he was trying to say,
In the midst of his laughter & glee,
He had softly & suddenly vanished away -- -
For the Snark was a Boojum, you see.
Lewis Carroll

MIMOSACEAE or *Mimosoideae* **MIMOSA FAMILY (SUBFAMILY)** *Mimosa*, from New Latin, from Latin *mimus* mime, from Greek μίμος, *mimos*, a buffoon, an imitator; & *-osa*, feminine of *-osus -ose*; akin to Greek *mimeisthai* to imitate, represent, from its apparent imitation of the sensitivity of animal life in drooping & closing its leaves when touched. A family of 78 genera, 3270 spp of trees, shrubs, & herbs that are native to tropical & temperate regions & have usually bi- or tripinnate often prickly leaves sometimes reduced to phyllodes & globular heads of small white or pink flowers; leaves alternate, with stipules, bipinnate; flowers small, in dense heads or racemes, petals valvate in the bud; corolla regular or nearly so, petals 4 or 5 (3-6) (often fused), inconspicuous, with one simple pistil which becomes the legume, stamens long, 5 to many, 2X or numerous, stamens strongly exserted. The group has tiny flowers with long projecting stamens tightly clustered on a "fuzzy" ball or spike. Includes ACACIAS, MIMOSAS, & MESQUITES. ACACIAS & MIMOSAS are the 2nd & 5th largest legume genera. The MIMOSAS are typically treated as the last group of the legumes, but they are included here for convenience.

Nodulation is more common in the MIMOSA family than in the SENNA family. There are several basal genera that never had the ability to nodulate & others that have lost the ability. Nodules of the *Mimosoideae* are indeterminate, often branched, with the central region containing both infected & uninfected cells, & often with a suberized cortex that may help protect against desiccation (Sprent 2001).

DESMANTHUS Willdenow 1806 **BUNDLEFLOWER** *Mimosaceae* ***Desmanthus*** Desman'thus literally bundle flower, flowering in bundles, New Latin, from Greek δεσμὴ, *desmè* bundle, from *dein* to bind akin to Albanian *dua* sheaf, Sanskrit *daman* rope, and New Latin *–anthus*, flower, from Greek ἄνθος, *anthos*. 25 (24) spp of mostly tropical American perennial herbs, shrubs, or trees with sensitive bipinnate leaves & small whitish acacia-like flowers, approximately 14 spp in USA. Herbs, stems not prickly; leaves bipinnate; flowers white in axillary pedunculate heads; legume dry, flat, 2-valved, 4 to 6-seeded, smooth. Formerly *Acuan* Medikus (or Medic).

Desmanthus illinoensis (Michaux) MacM. ex BL Robinson & Fernald ILLINOIS BUNDLE FLOWER, aka ILLINOIS MIMOSA, ILLINOIS SENSITIVE PLANT, PRAIRIE BUNDLEFLOWER, PRAIRIE-MIMOSA, PRAIRIE MIMOSA, PRICKLE BEAN, SPIDER BEAN, (*illinoensis -is -e* New Latin, of or from Illinois) The BUNDLEFLOWER common name is a reference to the bundled cluster of legumes. upl

Habitat: Gravelly riverbanks, railroad embankments, & levees; dry prairies & sand prairies, mesic & wet prairies, sandy wet savannas; in dry soil. Along riverbanks & railroads, on dry prairies. Local. distribution/range: Sp is the most widespread North American member of the genus. This sp may be adventive in non-riparian parts of northern Illinois, as it is often found along railroads. It is native to the middle Illinois River Valley, growing in

moist, gravelly shores & riparian prairies, where, in spite of the USDA's no anaerobic tolerance rating, it survives annual flooding, year after year, after year, after year, *ad infinitum, ad nauseum, adeste fideles*. Living near the polluted waters of the Illinois, these plants have tremendous genetic potential. Weakley states it is native mostly west of the Mississippi River & to the limestone areas of Tennessee. Packer fans consider it adventive in Wisconsin. Bears fans consider it introduced along northern Illinois railroads. Type locality: "*Hab. in pratensibus regionis Illinoensis.*" Michaux will get you if you don't watch out. Also known from along the Rock Island RR in Bureau Co west of Wyanet, but not mapped.

Culture: ①"Scarify then inoculate, or fall sow. Light cover. Good germination." (mfd 1993) ②Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ③No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ④Soak seed in water 6-8 hours prior to sowing in spring (pots2000). Growth rate moderate. Seedling vigor high. Vegetative spread rate none. Seed spread rate slow. 60,000 (stocks); 67,000 (appl02); 67,200 (pm02); 69,686 (gnh02); 72,000 (ew11); 78,208 (jfn04); 78,400 (aes12); 81,362 (gnh05); 85,000 (granite); 120,000 (usda, ecs); 161,280 (wns); 200,000 (shirley) seeds per pound. When planted alone, 8 oz per 1,000 ft sq (stocks). Pure stand plant 10 lb per acre (granite). In mixes plant 0.063 to 0.25 pls lbs per acre (gni). Seed availability is generally good, but availability varies with CRP cycles & there are & will be occasional short crops. Plants are in poor supply.

cultivation: Space plants 1.5-2.0'. Full sun, mesic to dry soils. Throughout the plains & southeast, requires minimum 16-20" precipitation. Medium to high moisture requirements. Best in moderately coarse to moderately fine soils. Best neutral soils, acid & base tolerant. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 5.0-8.0.

Some populations may potentially be salt/alkaline tolerant. In August 2012, several colonies were observed in the median of I-55 southbound, north of mile marker 106 near Springfield, Illinois. The plants were growing immediately adjacent to the concrete shoulder & were greener & healthier than the plants in the nearby clover-leaf infields plantings. They were observed at 9:30 AM, & promptly mowed at 12:30 PM that day by some politically-nepotistic, knuckle-dragging, drooling, Neanderthalic mower jockey with a neurotic sense of misguided accomplishments & bogus aesthetics, the kind of people that give Neanderthals a reputation they do ot deserve. Ironically, this trip was for an IDOT committee meeting on the increased & improved use of native plants on Illinois roads.

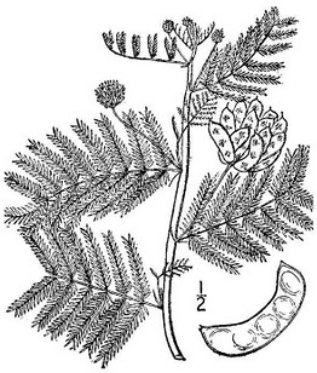
bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but early spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated unscarified seed. Germ 38.7, 40.5, 42, sd 18.8, r10-87 (77)%. Hard 44.8, 40.5, 83, sd 23.7, r7.0-83 (76)%. Test 18, 17, 15, r10-30 days**.

greenhouse & garden: Hull, scarify, moist cold stratify or fall plant & inoculate. Easy by scarified, inoculated & stratified seed. Best from seed, a delicate doily of a plug.

Description: Erect, warm-season, herbaceous, perennial, leguminous forb, puberulent or pubescent; from a deep tap-root, 12" minimum root depth; stems 2.0-4.0', with semi-woody stem bases; leaves bipinnate, pinnae 15-32 pairs; stipules filiform; inflorescences many flowered peduncled heads; flowers white to pinkish, perfect, or lower ones staminate; fruit globose, acacia-like, a crowded, dense head of curved legumes, reddish-brown, strongly falcate, glabrous, legumes 2-4 seeded; N. key features: "Leaves are bipinnate; numerous leaflets are often ciliate" (Ilpin).

Comments: status: This plant is considered invasive in some parts of its range (SWSS 1998). phenology: Blooms 7-8, followed by bundles of red brown pods. The ripe pods often split but the seeds remain intact for sometime. C3. Drought tolerant. Good fresh cut flowers or dried clusters of seedpods. Used for erosion control, works well in IDOT roadside plantings. May be aggressive or it may not like your site at all. Nitrogen-fixing legume. "Sp is distributed along levees. This is a good soil builder -- habitat on alluvial soils" (Ilpin). Seed source dry railroad remnants, Concord Twp, Bureau Co & Pine Rock Twp, Ogle Co.

Associates: Flowers pollinated by long-tongued bees. Nectar source for butterflies. Used for high protein wildlife food. Seeds desirable for wild birds, including upland game birds (pheasant, quail, prairie chicken), small mammals, & songbirds. Good palatability to big game,
VHFS: [*Acuan illinoense* (Michaux) Kuntze; *Darlingtonia brachyloba* & *glandulosa* DC, *Desmanthus brachylobus* Benth, *Mimosa illinoensis* Michaux]



Desmanthus illinoienis

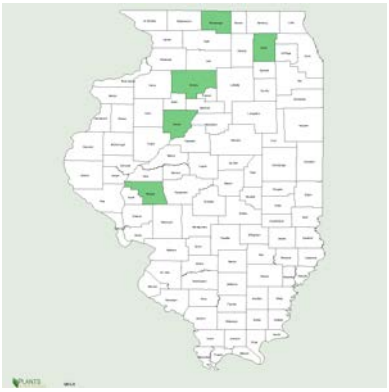
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database Not copyrighted image. Illinois map courtesy plants.usda.gov.

MIMOSA Linnaeus 1753 **MIMOSA** *Mimosaceae* ***Mimosa*** Mimo'sa New Latin, from Latin *mimus* mime, from Greek μίμος, *mimos*, a buffoon, an imitator; akin to Greek *mimeisthai* to imitate, represent, and *-osa*, feminine of *-osus -ose*; from its apparent mimicking of the sensitivity of animal life in drooping and closing its leaves of many species when touched. "The leaves seem sporting with the hand that touches them" (A Wood). A genus of about 500 (600) spp of herbs, shrubs, trees, & vines primarily of American tropical, subtropical, & warm temperate areas. The legume of our local spp is 4-angled & 4-valved. The legumes of some tropical spp separate into 1-seeded joints. x = 13? Formerly *Leptoglottis* DC, *Schrankia* Willd, not Medic, *Morongia* Britt.

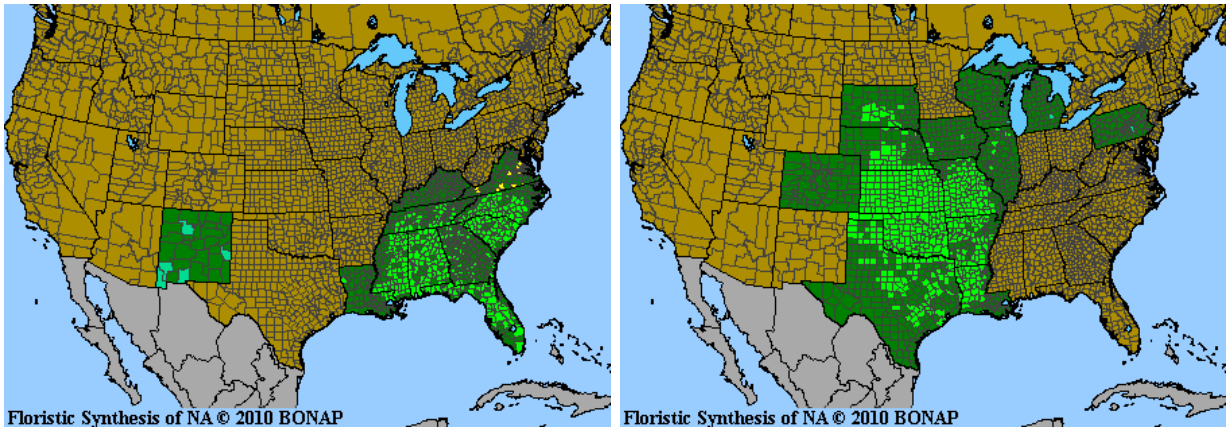
Mimosa is listed as a nectar source for *Dolba hyloeus* PAWPAW SPHINX MOTH (http://www.butterfliesandmoths.org/species/Dolba-hyloeus). *M. strigillosa* T&G is native.

Mimosa nuttallii (DC ex Britton & Rose) BL Turner NUTTALL'S SENSITIVE-BRIAR, aka BASHFUL BRIER, CATCLAW BRIER, DEVIL'S SHOESTRINGS, SENSITIVE-BRIER, SENSITIVE-PLANT, SHAME BOY, (*nuttallianus, -a -um* after Thomas *Nuttall* (1786-1859), of Philadelphia (the Brits refer to him as an English botanist, but his botany was All American).)
Habitat: Sandy & gravelly soils; acidic soils. distribution/range: Rare in Illinois, Bureau, Kane, Morgan, Peoria, & Winnebago cos. Perhaps adventive in the northern part of its range, perhaps not.
Culture: ①No pretreatment needed. Sow seeds on the soil surface at 70ºF & water. Slow to germinate. (ew11)
Cultivation: Space plants 1.0-3.0'.

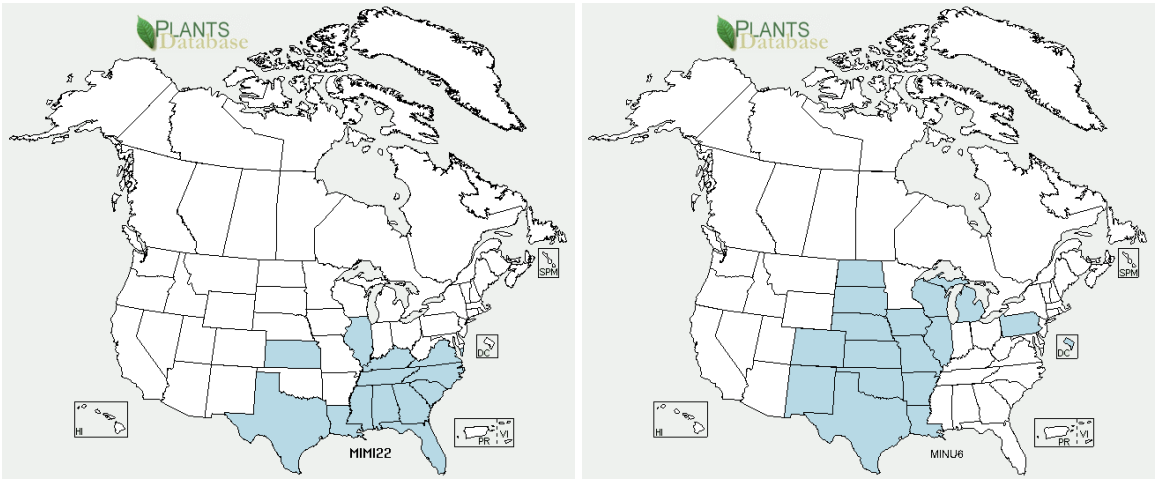
Description:
Comments:
Associates: Reported as resistant to deer.
VHFS: [*Leptoglottis nuttallii* DC, *Mimosa quadrivalvis* L var *nuttallii* (DC) Beard ex Barneby, *M uncinata* Britton, *Schrankia nuttallii* (DC) Standl, *S uncinata* Am auth not Willd]



Plants.usda.gov maps *Mimosa microphylla* Dryand, LITTLELEAF SENSITIVE BRIAR & *Mimosa nuttallii* (DC ex Britton & Rose) BL Turner, NUTTALL'S SENSITIVE-BRIAR from the same 5 Illinois cos, & only those 5 counties in Illinois. The former is mapped as a primarily southern/southeastern spp, & the latter a primarily southeastern spp. BONAP maps the Illinois material as *Mimosa nuttallii.*



Mimosa microphylla & *M. nuttallii* courtesy of BONAP (2010)



Mimosa microphylla & *M. nuttallii* courtesy of plants.usda.gov, accessed 9/10/12. Oddly, in Illinois, the same 5 co records are mapped for both spp, & only those 5 co records.

(add plants.usda.gov Illinois maps)

SCHRANKIA Willdenow **SENSITIVE BRIER, CATCLAW** *Schrankia* Shran'kia in honor of Francis de Paula Schrank, German botanist. Legume long & narrow, echinate, dry, 1-celled, 4-valved, many seeded. Now included in *Mimosa*.

Combine this text with the above entry. Synonyms. Ironically, one native vendor is selling both "taxa".

Schrankia uncinata Willdenow [new nomenclature *Mimosa microphylla* Dryander] CAT-CLAW, aka BASHFUL BRIER, CAT'S CLAW SENSITIVE BRIER, DEVIL'S SHOESTRINGS, NUTTALL'S SENSITIVE BRIAR, SENSITIVE BRIER, SENSITIVE PLANT, SENSITIVE ROSE, SHAME BOY, SHAME BRIAR, SHAME FACE, SHAME VINE, SHAMEWEED, SHAMING JUDY, (*uncinatus -a -um* Latin hooked or barbed, with barbed bristles, with hooks, with a hooked end, hooked at the point, from *uncinatus -a -um,* hooked.) The common names are from the curved prickles (briers), the sensitive behavior of the leaves, & the deep roots.

Habitat: Glades, open woods, dry prairies. Prairies, ravines, & open woods. In dry soils, prairies & open woods. Rocky or sandy, dry or well-drained soils. Often found in acid soils. distribution/range: Rare in Illinois, Bureau, Kane, Morgan, Peoria, & Winnebago counties. Sp is at the northwest limit of its range in Illinois.

Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Seeds need scarification. Legume, requires appropriate rhizobial inoculum. Seeds germinate after about 10 days of cold moist stratification. (he99) ③No pre-treatment needed. Sow seeds just below soil surface at 70º F & water. (ew12) 27,776 (wns2001); 32,000 (pm02, ew11), 80,000 (prairiesource.com) seeds per pound.

Cultivation: Space plants 1.25-1.5'. Dry soils, full sun. Difficult to establish (Ilpin).

Description: Native, erect, herbaceous, perennial forb, stems to 3.0', weak, sprawling, grooved, with hooked prickles; leaves light, airy, bipinnate, 12-18 leaflets, inequilateral at the base, strongly veined below, somewhat sensitive to the touch, closing at night or in cloudy weather; inflorescence dense, axillary, 1 or 2 together globose pedunculate clusters, of ca 70 flowers, flowers sessile or on pedicel to 1 mm long, peduncles prickly, to 7 cm long; flowers rose, mimosa-like (small pink balls), perfect or polygamous, fragrant, 4-5 sepals, 4-5 united petals, 8–10 pink or rose-purple stamens, & 1 pistil; fruit a legume 2.0+" long, slender, somewhat terete, beaked, densely prickly; legumes narrow, 4-angled, prickly all over, finally 4-valved. key features: " Lateral veins of leaflets are raised beneath; leaflets are sensitive to touch" (Ilpin)

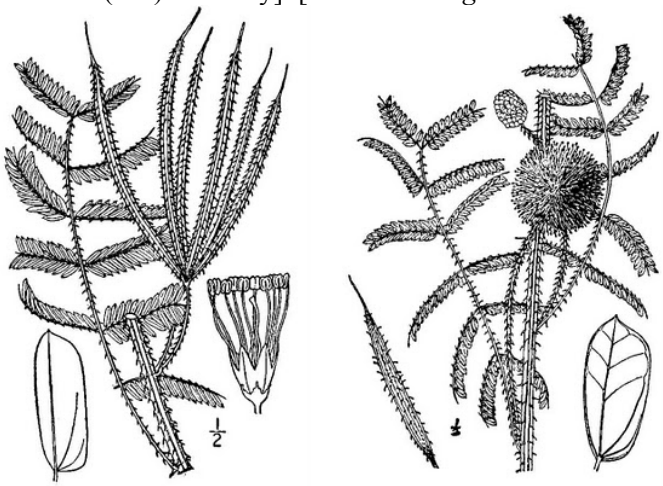
Comments: status: phenology: Blooms 5-6 (6-9). C3. Collect seeds in se Wisconsin in August - September (he99).

Associates: Upland game eats the leaves. Leaves are eaten by livestock; 25-45% protein in young growth (Ilpin).

ethnobotany: Seeds have been used as laxative.

VHFS: In Britton & Brown (1913), this was listed as *Morongia microphylla* & *Morongia uncinata*.

[Mohlenbrock has *Schrankia nuttallii* (DC) Standley] [*Schrankia angustata* T&G in A Wood]



Schrankia nuttallii, Schrankia uncinata, or Mimosa nuttallii

Line drawings Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant spp*. Not copyrighted image.

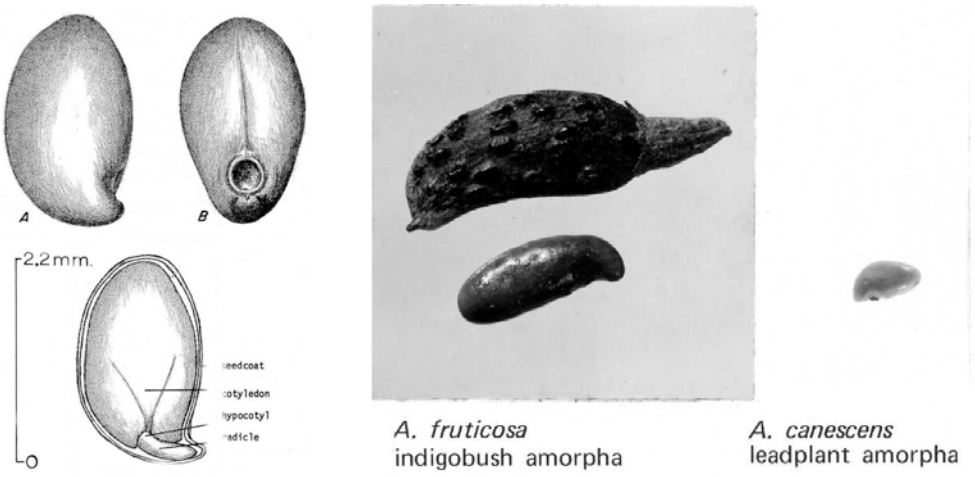
PAPILIONACEAE or *Papilionoideae* **BEAN, PEA FAMILY** *Fabaceae* New Latin, from *Faba*, type genus, Latin for bean, from Greek *phakos* lentil & *-aceae*. A large, nearly cosmopolitan family of 764 genera & 13,800 spp (28 tribes) that comprises the peas, beans, & related herbaceous or woody plants with pea-like flowers & a legume as fruit & that is now usually included in the family *Leguminosae*.

Family traits: leaves alternate, with stipules, simple or pinnate, flowers with one simple pistil which becomes the legume, flowers zygomorphic with sepals fused into a tube, petals mostly 5 (1 in *Amorpha*), corolla usually papilionaceous, the standard being the larger upper petal, uppermost or banner petal enclosing the lateral ones in the bud, the clawed wings being the 2 side petals, with the 2 lowest or keel petals more or less united.

Nodulation in the Bean family is fairly common. As in the *Mimosa*, there are several basal genera that never had the ability to nodulate & others that have lost the ability.

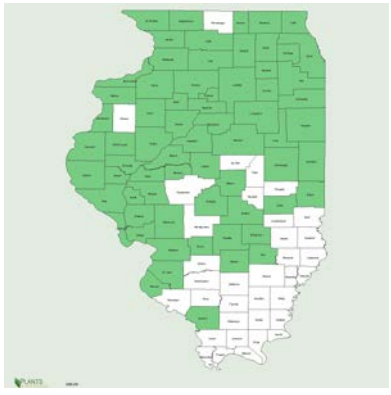
Botanically speaking, tomatoes are the fruit of a vine,
just as are cucumbers, squashes, beans & peas.
- Horace Gray

AMORPHA Linnaeus 1753 **INDIGO BUSH, LEAD PLANT** *Fabaceae Amorpha* New Latin, deformed one, from Greek αμορφὴ, *amorphè*, feminine of αμορφος, *amorphos*, shapeless, deformed, formless, from α, a, privation, & μορφὴ, *morphè,* applied to the abnormal flowers; the flower of the *Amorpha* consist only of one petal, the standard, with the typical wing & keel petals missing. American herbs or shrubs with odd-pinnate leaves & purplish spicate flowers, the corolla being reduced to one petal. The other four typical legume petals are missing. Shrubs or half shrubby; leaves unequally pinnate, silvery; inflorescence dense, virgate raceme; flowers purple flowers with bright orange stamens; legume oblong, somewhat curved at the point, scabrous with glandular points, 1 to 2-seeded.



Courtesy of USDA Forest Service.

Amorpha canescens Pursh * MI LEAD PLANT, aka LEADPLANT AMORPHA, PRAIRIE SHOESTRING, SHOESTRINGS, WILD TEA, (gray or white, & somewhat hairy, gray-pubescent, New Latin *canescens* gray, grayed, or hoary, from *canesco*, I become white or gray, for the grayish-pubescent leaves.) The 'LEAD' common name is from the lead gray color of the hairy leaves. SHOESTRINGS are in reference to the long roots. At one time, the presence of the plant was thought to indicate lead deposits. Upland



Habitat: Mesic, dry, sand, hill, & gravel prairies, oak savanna, open woodlands; prairies, rocky wooded bluffs. "Common on dry prairies & in sandy places" (ewf55). "In dry, sandy soils, Wis to La & R Mts, & and is supposed to prefer localities of lead ore (w73).

Culture: ①"Very gently scarify seed, then inoculate with *Amorpha* Spec. 1, or fall sow. Sometimes suggested to moist cold treat seed for 10 days after scarification, but in my experience this is not necessary. Light cover. Watch for damping off. Good germination, development can be slow." (mfd93). ②Seeds must be hulled. 10 days cold moist stratification (pm09). ③Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum (he99).

④"10 days moist stratification recommended, but not necessary. Field sow spring, early summer." (pnnd) ⑤Scarify. Pour 180ºF water over seeds, let soak overnight. Sow seeds just below soil surface at 70ºF & water. (ew11) ⑥Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). 147,811 (gna05unhull); 152,991 (gni03); 153,223 (gna11); 181,440; 256,000 (pm02); 264,000 (ew11); 272,000 (pn02, jfn04, sh94, aes12); 306,756 (gnh02); 307,172 (gna04); 313,320 (gna05); 328,509 (gna04); 374,279 (gna06); 488,320 (wns01) seeds per pound.

"*Amorpha canescens* Mesic to dry prairie. Blooms late June to mid July; DEEP PURPLE. Harvest October. 2'; Success with SEEDLING TRANSPLANT & SPRING BROADCAST. Seedlings die in flats, do poorly in field seeding. Need inoculation. Leguminous shrub, with flowers on new wood, thus like a perennial. Grows slowly first few years." (rs ma)

asexual propagation: Stem cuttings.

cultivation: Space plants 1.25-1.5(2.0)'. Well-drained soils, full sun to partial shade. Very drought tolerant once established. Zones 3-8.

bottom line: Genesis test data indicate hulled seed is successful by spring or dormant seeding. Scarify & inoculate for spring planting, dormant plant with inoculated unscarified seed. Germination inhibitors may be present in the dried floral remains. Germ 64.1, 66.5, 63, sd 24.2, r6.0-94.5 (90.5). Hard 15.5, 10.5, 4.0, sd 16.1, r0.0-60 (60)%. Test 18, 15, 12, r12-43 days.**

greenhouse & garden: Transplants easily, spreads easily but slowly by seeds, few problems. Requires scarification. Hulling & scarifying are most important before other treatments. Moist cold stratify (10) or dormant seed, inoculate. Easy from scarified, hulled seed or moist stratified seed. Bottom heat 76°F gives immediate & dramatic results. Sowing fresh seed reported to give some results. Acid scarification 10-15 minutes can be used for large lots, but this is not for the meek & timid. Successional restoration.

Description: Erect, woody, perennial, native forb, 0.7-3.3(-4.0)' tall, deciduous shrub (woody undershrub), nitrogen fixing; from deep taproots, 10-16'; stems branched, spreading; leaves pinnately-divided into 13-20 pairs of dense, silvery leaflets, blackening when dried; inflorescence 2"-6", spike-like clusters (racemes) in groups of 5-20 mostly at the ends of the stem; flowers small purple, 5-merous, 0.25" long, only 1 petal, stamens bright orange, yellow anthers, flowers perfect; fruits a generally one-seeded legume, oblong, curved, small, hairy, hard pod, 0.38" long, with 1-2 seeds; N. key features: ①Flowers purple, stamens bright orange, leaflets silvery-hairy. ②"Densely white-hairy; leaflets sessile or nearly so" (Ilpin). ③Suffruticose, leaflets mucronate, vexillum bright blue (w73).

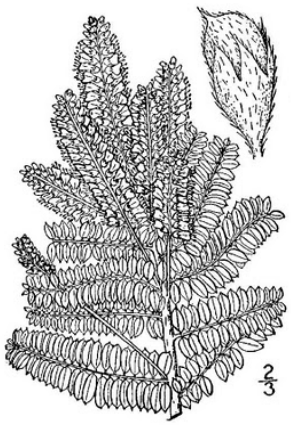
Comments: status: Special concern in Michigan. phenology: Blooms 6,7,8. C3. In northern Illinois, collect seeds in late August - October. Collect seeds in se Wisconsin in October (he99). One of the true shrubs of the prairie. Attractive spikes of purple & gold flowers with hairy "lead gray-green" (silvery-gray) compound leaves. Attractive cut flowers & interesting dried seed heads, landscaping, low borders, specimen plantings, xeriscaping, good in the garden, pollinator gardens, & wildlife plantings. Seed source nursery production originally from dry prairies Green River Lowland, Shaw Station, Lee Co & black soil remnant, Clarion Twp, northeastern Bureau Co.

What Einstein decided de-hulled is a proper word in the seed industry? Again, for the dipsticks, by AOSA nomenclature, seeds are unhulled & hulled, never dehulled! This is a fine example of an error in a set of specifications being mindlessly copied and pasted because people are lazy, gullible, & complacent.

Amorpha canescens "Those two beautiful plants, for our knowledge of both of which, I believe, we are indebted to Mr. Nuttall, the *Aster sericeus* and *Amorpha canescens*, are very generally diffused, but not in the same abundance with many others. Indeed, they constitute an exception to the habit of congregation among so many of their associates." "Mr. J. A. Lapham, of Wisconsin, informs me that in that territory, the *Amorpha canescens* is called 'lead-plant,' from the circumstance of its growth being considered indicative of the presence of that mineral. If the same sign should hold good in Illinois, the whole of the prairies may one day become a mining region." *Amorpha canescens* Pursh (Short 1845)

Associates: Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, & *Diptera*. Leadplant is the larval host for the DOG FACE BUTTERFLY. Attracts butterflies, butterfly larvae, bees, songbirds, upland game birds, small mammals, contributes to overall diversity for wildlife, but of intermediate value to wildlife. Reported to be deer resistant, but LEADPLANT is highly palatable to herbivores.

VHFS: [*Amorpha brachycarpa* EJ Palmer, *A canescens* Pursh f *canescens*, *A canescens* Pursh f *glabrata* (A Gray) Fassett, *A canescens* Pursh var *glabrata* A Gray]


Amorpha canescens, & galls on *A canescens* stems

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database Not copyrighted image.

Amorpha fruticosa Linnaeus INDIGO BUSH, aka BASTARD INDIGO, DESERT FALSE INDIGO, DESERT INDIGO-BUSH, FALSE OR BASTARD INDIGO, FALSE INDIGO BUSH, INDIGOBUSH, INDIGOBUSH AMORPHA, RIVER-LOCUST, TALL INDIGO BUSH, (*fruticosus -a -um* (froo-ti-KO-sus) shrubby, bushy, from Latin *fruticosus*, bushy, shrubby, from *frutex*, a shrub.) Facultative Wet +

Habitat: Usually in riparian habitats, including wet meadows, fens, river bottoms, floodplains, & moist soil, along rocky streams, riverbanks, thickets; stream banks, ditch-banks, & other moist soils. Occasional in ditches in the Green River Lowland. distribution/range: Sp has a very geo-political distribution on the Illinois-Indiana & Alabama-Georgia borders (bonap 2010).

Culture: ①10 days cold moist stratification (pm09). ②10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum (he99). ③Scarify. Pour 180ºF water over seeds, let soak overnight. Sow seeds just below soil surface at 70ºF & water. (ew11) Spreads moderately by seed. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. 52,000 (usda, ecs); 56,000 (ew11); 59,200 (pm); 62,968 (gnihsl02); 77,000 (wns01); 105,488; 105,600 (aes10) seeds per pound. Seed is generally available. Plugs are not commonly grown in quantity.

cultivation: Plugs transplant easily. Tolerant of coarse, medium, & 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. BMPs do not include annual burning. The winter of 2013-14 top killed 90% of our plants.

bottom line: Genesis test data indicate seed is successful by spring or dormant seeding. Some lots may benefit from dormant seeding. Scarify & inoculate for spring planting, dormant plant with inoculated, unscarified seed. Germ 70.4, 75, na, sd 9.8, r52-79 (27)%. Hard 13.4, 7.0, na, sd 12.7, r4-38 (34)%. Test 25, 27, 27, r17-27 (10) days.**

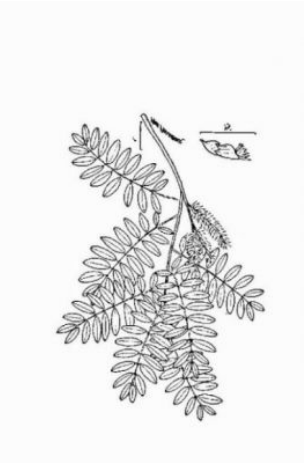
greenhouse & garden: Scarify or hot water treatment & steep seeds for 12 hours; or fall plant outdoors (cold moist treatment sometimes gives poor results), inoculate, cuttings. Acid scarification (10-15 min) can be used for large lots; but not for the meek & timid.

Description: Multi-stem branching, deciduous, native shrub or small tree, 6.0-12(-15)'; flowers small purple, perfect, scented, 5-merous, with gold anthers; fruits are a small, 1-(2)seeded pods, 0.33-0.50" long with resinous dots, persisting into winter.
Comments: status: Potentially invasive, banned in Connecticut. Class B noxious weed, & noxious weed seed & plant quarantine in Washington. This plant is considered invasive in some areas (Assorted authors. 200_. State noxious weed lists for 46 states). phenology: Blooms 6,7,8. Collect seeds October (he99). Seeds persist into fall & winter. Landscaping, specimen plantings, windbreaks, screens, & borders, very impressive in blossom, bog gardens, truly wet rain gardens, & wetland restoration. One of the few native wetland legumes that are commercially available. Seed source nursery production, genetic origin Leepertown Twp, Bureau Co.

"Roughs" along "the margins of 'sloughs,' and along the courses of small streams" *Amorpha fruticosa* L. (Short 1845).

"Occasional in damp soil, mostly on steam banks. Rock River near Rockford College, Kishwaukee River in the gorge above new Milford, Killbuck Creek near US Rt No 51 & Coon Creek & Sugar River near the Illinois-Wisconsin line." (ewf55)
Associates: Pollinated by long-tongued bees & short-tongued bees. Larval host of SILVER-SPOTTED SKIPPER & CALIFORNIA DOGFACE. Attracts marsh birds, shorebirds, & 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.

The plant has resinous pustules on the seedpods that contain the toxin amorpha (a rotenoid), a contact & stomachic insecticide (& piscicide), which also act as an insect repellent (Huxley 1992)
VHFS: [*Amorpha angustifolia* (Pursh) Boynt, *A arizonica* Rydb, *A bushii* Rydb, *A croceolanata* PW Wats, *A curtissii* Rydb, *A dewinkeleri* Small, *A fruticosa* L var *angustifolia* Pursh, *A fruticosa* L var *croceolanata* (PW Wats) PW Wats ex Mouillef, *A fruticosa* L var *emarginata* Pursh, *A fruticosa* L var *oblongifolia* Palmer, *A fruticosa* L var *occidentalis* (Abrams) Kearney & Peebles, *A fruticosa* L var *tennesseensis* (Shuttlw ex Kunze) Palmer, *A occidentalis* Abrams, *A occidentalis* Abrams var *arizonica* (Rydb) Palmer, *A occidentalis* Abrams var *emarginata* (Pursh) Palmer, *A tennesseensis* Shuttlw ex Kunze, *A virgata* Small]
add Illinois varieties

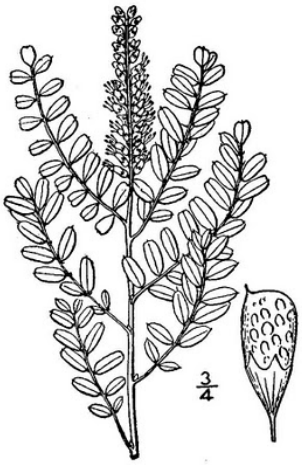




un-copyrighted draught

Amorpha fruticosa

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Photo 1 Robert H Mohlenbrock USDA-NRCS PLANTS Database. Not copyrighted image. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant spp*. Not copyrighted image.

Amorpha nana FRAGRANT FALSE INDIGO, aka DWARF FALSE INDIGO, DWARF INDIGO, DWARF INDIGO BUSH, DWARF WILD INDIGO, FRAGRANT INDIGO BUSH, (*nanus -a -um* a dwarf, from classical Latin noun *nānus, nāni* m., (also *nannus*), or ancient Greek νᾶνος, *nanos,* also νάννος, *nannos,* a dwarf.) Na Nuu, Na Nuu, Mork calling Orson, come in Orson.
Habitat: Native west & north of our area. distribution/range:
Culture: ①10 days cold moist stratification (pm09). ②Scarify. Pour 180ºF water over seeds, let soak overnight. Sow seeds just below soil surface at 70ºF & water. (ew11) 157,696 (wns01); 160,000 (pm); 176,000 (ew11) seeds per pound.
cultivation: Space plants 12-15".
Description:
Comments: status: phenology: Blooms



Amorpha nana

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Tracey Slotta - USDA-NRCS PLANTS Database Not copyrighted image.

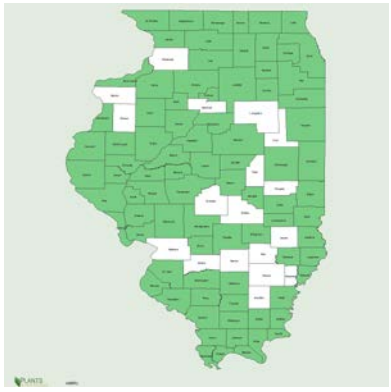
Add *A nitens*

AMPHICARPAEA Elliot ex Nuttall 1818 Formerly, frequently, & incorrectly spelled *Amphicarpa*.
HOGPEANUT *Fabaceae Amphicarpa* both kinds of seeds, from Greek ἄμφι, *amphi*, Latin *ambo*, both, of both kinds, & from καρπὸς, *karpos*, fruit, for the aerial & subterranean seeds. The latter exhibit geocarpy, from Greek γεω-, *geo-*, combining form of γῆ, *ge*, earth, & καρπός, *karpos*, fruit, a condition of plants whose fruits ripen underground. 3-5 (5-6) spp of North American, Asiatic, & montane African vines having trifoliate leaves & small

white or violet flowers & bearing both aerial chasmogamous flowers & hypogeous cleistogamous flowers. Legume flat, 2 to 4-seeded. Local taxa are herbaceous vines; leaves pinnately trifoliate; upper flowers white to lavender, usually complete, usually barren, the lower apetalous & fruitful; legumes flat, few seeded, coiling when open.

"It now appears that 2-3 semi-cryptic taxa should be recognized in what has traditionally been considered a single sp of *Amphicarpaea* (Callahan 1997, Parker 1996)" (w11)

Amphicarpaea bracteata (Linnaeus) Fernald * NH AMERICAN HOGPEANUT, aka HOG PEANUT, GROUND BEAN, WILD PEANUT, (*bracteatus -a -um* Latin for bracted, bracteate, having bracts) fac
Habitat: Wet savannas, damp woodlands, & thickets. Moderately moist to wet woods, forests, prairies & meadows. distribution/range:



Cultivate: ①Scarify & fall plant or pre-soak 12 hours in warm water & inoculate. Plant in semi shade. Fall planted seed will need protection from critters. 19,220± seeds per pound, seed count is highly variable. Seed & plants are commercially non existent & unavailable.
Description: Native, annual, twining, herbaceous vine; 6.0-60" long; tap-rooted; leaves long stalked, divided into 3 broadly-oval leaflets; inflorescence a loose cluster from the leaf axil; chasmogamous flowers purple to lilac to white, 5 parted, 0.50" long, stalked; apetalous, cleistogamous flowers are on creeping branches near the ground; fruits are flat, oblong pod pointed at both ends, cauline legume smoothish, 3-4 dark purple seeds, radical legume often subterraneous, one large, compressed, brown seed; key features: "Two to three kinds of fruit are produced by 2-3 kinds of flowers; apetalous flowers producing subterranean fruit; stems with ascending white hairs; sides of legumes are glabrous." (Ilpin) Flowers stalked; broadly oval leaflets.
Comments: status: Variety *comosa* is Threatened in New Hampshire. phenology: Blooms 8,9. C3. Wetland restoration. Seed source nursery production.

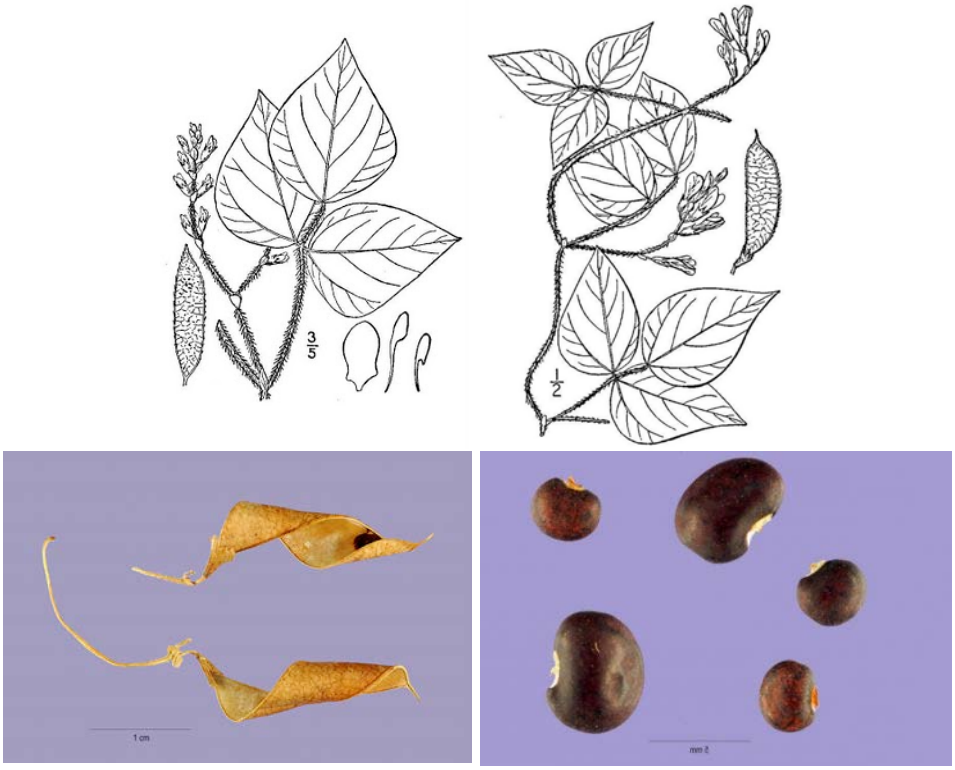
"Common in deep woods. This, the thin leaved slightly pubescent form, is less common than the next & does not grow in open places so often." (ewf55)

"*A comosa* (L) G Don This, the thick leaved densely pubescent plant is in our experience, much the more common & is more likely to grow in open places. (*A bracteata* var *comosa* (L) Fern)" (ewf55)
Associates: Large subterranean seeds are small mammal magnets.
Ethnobotany: Beans are available in autumn. Vole nests often contain several quarts of beans (Fernald & Kinsey 1943). Subterranean fruits used for food by Ojibwa (raided rodent stores in autumn) & Sauk-Fox (sm28, 32). An important food for all tribes within its range (Gilmore 1928). Used as medicinal plant by Ojibwa (den28).

Densmore (1928) lists *Falcata comosa* (Linnaeus) Kuntze, HOG PEANUT, *Bugwudj'miskodi'simin,* unusual, reddish bean, an Ojibwa physic.
VHFS: In Britton & Brown (1913), this is known as *Falcata pitcheri* & *F comosa.* "It now appears that 2-3 semi-cryptic taxa should be recognized in what has traditionally been considered a single sp of *Amphicarpaea"* (Callahan 1997, Parker 1996 in w07).

Sw94 note the var *comosa* (Linnaeus) Fern, LOWLAND HOG PEANUT. DESCRIBE VARIETIES

[*Amphicarpaea bracteata* (L) Fern var *bracteata, A bracteata* (L) Fern var c*omosa* (L) Fern, *A bracteata* (L) Fern var *pitcheri* (T&G) Fassett, *A comosa* (L) G Don, *A monoica* (L) Elliott, *A monoica* Nutt, *A pitcheri* T&G, *Falcata comosa* (L) Kuntze, *F pitcheri* (T&G) Kuntze, *Glycine bracteata* L, *G comosa* L, *G monoica* L]

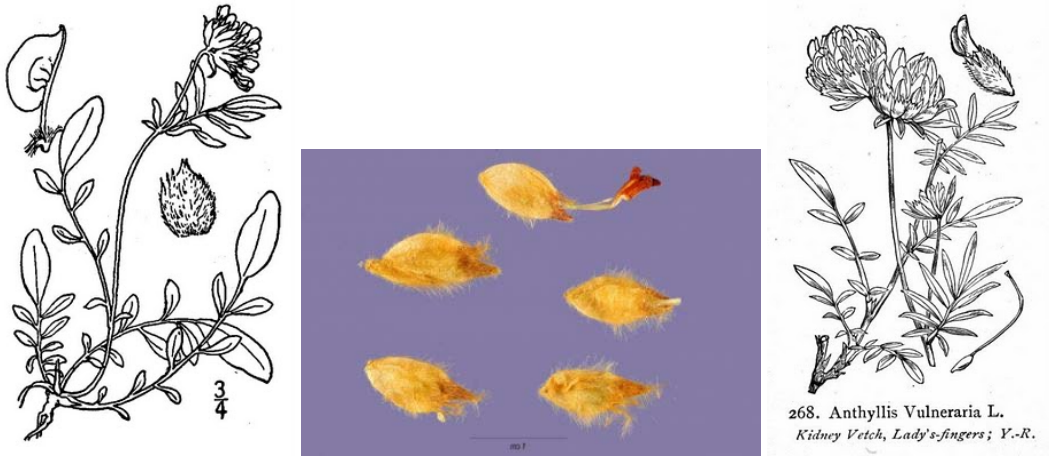


Amphicarpaea bracteata as *Falcata pitcheri* & *F comosa*

Line drawings Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed & pod photos Tracey Slotta - USDA-NRCS PLANTS Database Not copyrighted image.

ANTHYLLIS Linnaeus **KIDNEYVETCH** New Latin, downy-flower, from Latin, a plant name, from Greek an ancient name used by Dioscorides, ανθ-υλλις, *anth-yllis.*

Anthyllis vulneraria L COMMON KIDNEY-VETCH, aka LADY'S FINGERS, WOUNDWORT, (*vulnerarius -a -um* for healing wounds, from Latin *vulnerarius -a -um,* of or belonging to wounds.)
Introduced from the Mediterranean, adventive, annual-perennial forb.



Anthyllis vulneraria

1st Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Tracey Slotta USDA-NRCS PLANTS Database Not copyrighted image.

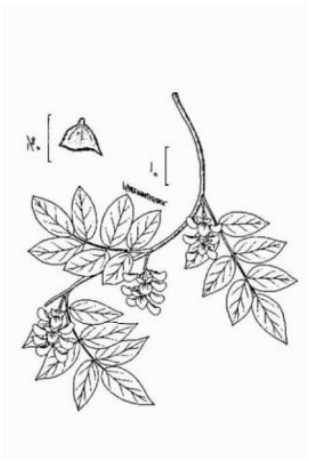
APIOS Fabricius 1759 **GROUND NUT, POTATO-BEAN** *Fabaceae Apios* New Latin, pear (-rooted), from Greek, Ἀπιος, *Apios* pear tree, απιον, *apion* pear; AMERICAN GROUNDNUT, *Apios tuberosa*, from the shape of the tubers. *Apios* is a widely distributed genus of about 7-10 spp trailing or climbing perennial herbs having tuberous roots, compound leaves, small racemose flowers, & linear pods, relictually of temperate east Asia & eastern North

America. Local plants are vines of shaded, moist areas; leaves odd-pinnate, pink-brownish flowers in pointed tight clusters; pods inflated, coiled when open. Formerly included in *Glycine*.

Apios americana Medikus GROUNDNUT, aka AMERICAN POTATO BEAN, COMMON GROUNDNUT, DAKOTA PEAS, GROUND BEAN, *HOPNISS*, INDIAN POTATO, ROSARY ROOT, *PATATES EN CHAPELET*, PEA VINES, *POMME DE TERRE*, POTATO BEAN, SEA VINES WILD BEAN, WILD BEAN, WILD POTATO, WILD SWEET POTATO, *PIN,* (*americanus -a -um* (a-me-ri-KAH-nus) of the New World, from the Americas, American.)

Habitat: Rich damp thickets & boggy land in abundance (ry64). " It was formerly common in damp or marshy soil throughout the woodlands & prairies of eastern & central temperate North America." (Beardsley 1940). Thickets next to calcareous springy places or marshes, wet prairies & savannas (sw94). "Occasional in moist places & weed patches. North Springfield avenue road at Kent Creek & the bank of a drainage ditch west of Shirland. At times it forms dense masses." (ewf55) distribution/range:
Culture: Easy by tubers 2-3" deep in spring. Growth rate rapid. Seedling vigor medium. Vegetative spread rate none? Said to be commercially routinely available (USDA), but not in our experience.

Cultivation: Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance high. CaCO3 tolerance high. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 6.0-7.5.
Description: Twining, annual/perennial, herbaceous, native vine, up to 7' long; from slender rhizomes with 2 or more elongated, 1" edible tubers, 8" minimum root depth; stems; leaves odd pinnate, usually 5-7 leaflets; inflorescence a dense, raceme (conical cluster) of stalked flowers; flowers pink to brown, 5-merous; 0.50" long, either solitary or in pairs; fruits are linear pods coiling after opening, containing several seeds; N. key features: Twining vine; elongated tubers; conical raceme of brownish purple sweet pea flowers, odd pinnate leaves" (fh)
Comments: status: phenology: Blooms 7,8,9. C3. "To the roots are appended oval, fleshy tubers, which are very nutritious, & would perhaps be cultivated had we not the potato (w73).
Associates: ethnobotany: Tubers said to be available year round (?). Gathered by Ojibwa in spring (den28), dried for winter by Menominee (sm23), sometimes planted by Iroquois (Waugh 1916). Used as food by Pottawatomie, Mascouten, Sauk-Fox, & Kickapoo (sm28, Skinner 1926, Hunter 1823b, Beardsley 1940). Important food for all tribes within the plant's range. "Great quantities once grew along the *pinconning*, or place of the *pin*, in Bay Co, Michigan, where the Indians returned every year" (Gilmore 1933). There are tremendous populations along the trails at the Green Bay Botanic Garden.
VHFS: [*Apios americana* Medik f *pilosa* Steyerm, *A americana* Medik var *turrigera* Fern, *A tuberosa* Moench, *Glycine apios* L]



Apios americana

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant spp*. Not copyrighted image.

Apios priceana BL Robins. *US, IL, KY, TN TRAVELER'S DELIGHT, aka KENTUCKY GROUNDNUT, PRICE'S GROUND NUT, PRICE'S POTATO-BEAN, PRINCE'S POTATO BEAN,

Habitat: In the southeastern USA, mixed oak woods, especially over limestone; rare (w10). Open woods & along wood edges in limestone areas. distribution/range: Low woods, very rare" Union Co; not seen since 1948 (m14). Southern Illinois, Kentucky, Tennessee, Mississippi & Alabama.

Culture: Possibly easy from tubers or seed. Knick seed coat & germinate at 70ºF.

Description: Native, herbaceous, perennial vine; from a thick, stout tuber; stems; leaves; N. key features: "Flowers rose-colored or greenish-white tinged with purple; largest petal with a spongy projection. Legumes twist after dehiscence." (Ilpin)

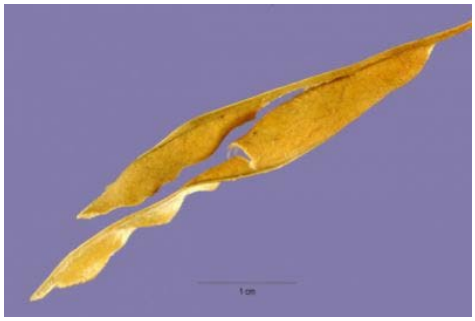
Comments: status: Threatened in the United States. Endangered in Illinois, Kentucky & Tennessee. phenology: Blooms mid- June-August. Fruits ripen late August to early October. "In Illinois known only from Wolf Lake & Otter Pond in Union Co. Here it is associated with *Acer saccharinum*, *Populus deltoides*, *Acer rubrum*, *Quercus macrocarpa*, *Carex frankii*, *Glyceria striata*, *Impatiens biflora*, & *Scutellaria lateriflora*." (Ilpin)

Associates: Pollinators include *Urbanus proteus* LONG TAILED SKIPPER, honey bees, & bumble bees.

Ethnobotany: Large tubers are edible & may have been used by Native Americans & early settlers as food.

VHFS:

http://www.centerforplantconservation.org/collection/cpc_viewprofile.asp?CPCNum=149



Apios priceana

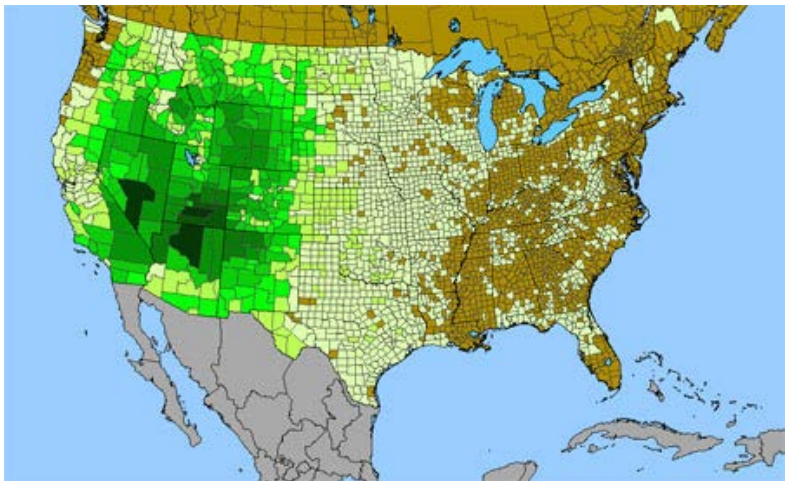
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Pod & seed photos Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image.

ASTRAGALUS Linnaeus 1753 **MILK VETCH, GOATS-THORN, LOCOWEED, POISON-VETCH** *Fabaceae*

Astragalus Old Greek for ankle-bone, αστραγαλος, *astragalos*, a Greek name in Pliny for a plant with vertebra-like knotted-roots; name for another legume, possibly *Orobus niger,* a milk vetch, one of the vertebrae, & also of un-copyrighted draught

talus bone of the ankle. In addition, 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 milk. Date: 1541

Approximately 2,000 (1500) spp of herbs & shrubs of north temperate & arctic zones. The genus is most numerous & diverse in the arid regions of western North America & western & central Asia. In North America, about 5 spp are known from east of the Mississippi River. Our spp are perennial herbs from a stout taproot, caudex, or rhizome, leaves odd pinnate, leaflets numerous, flowers white, yellowish-white, pink, or purple, inflorescence axillary, loose or dense, elongated or contracted raceme, legumes inflated, 2-celled by the introflexion of the lower suture.



Density gradient of native spp for ***Astragalus*** within the US (data 2011). Darkest green (57 spp. Garfield Co, UT) indicates the highest spp concentration. ©BONAP

Rydberg segregated the genus into 28 smaller genera, one of which was *Geoprumnon* Rydb (earth plum, New Latin, from classical Latin *geo-* & its etymon ancient Greek γεω-, *geo*-combining form of γῆ, *ge,* earth, of unknown origin, & Hellenistic Greek προῦμνον, *proumnon*, plum; compare classical Latin *prūnum* n., *prūnus* f, plum, & Hellenistic Greek προύμνη, *proumne,* plum tree.). It was composed of five spp native of central North America, with pods globose to conic-fusiform, fleshy, becoming spongy, indehiscent, completely 2-celled.

Proposed but seldom-observed politically correct common name recommendations (from western source, late 1970s or earlier)

MILKVETCH is a name for spp of *Astragalus* that are nonpoisonous & are frequently good forage, including *A crassicarpus* & *A spatulatus.*

POISONVETCH is a name for spp of *Astragalus* that accumulate selenium & can cause livestock poisoning, including *A bisulcatus* & *A racemosus.*

LOCOWEED is a name for those spp of *Astragalus* that cause locoism, including *A mollissimus.*

POINTVETCH is a name for spp of *Oxytropis* not known to be poisonous.

CRAZYWEED is a name for members of genus *Oxytropis* that produce locoism, including *O lambertii* & *O sericea.*

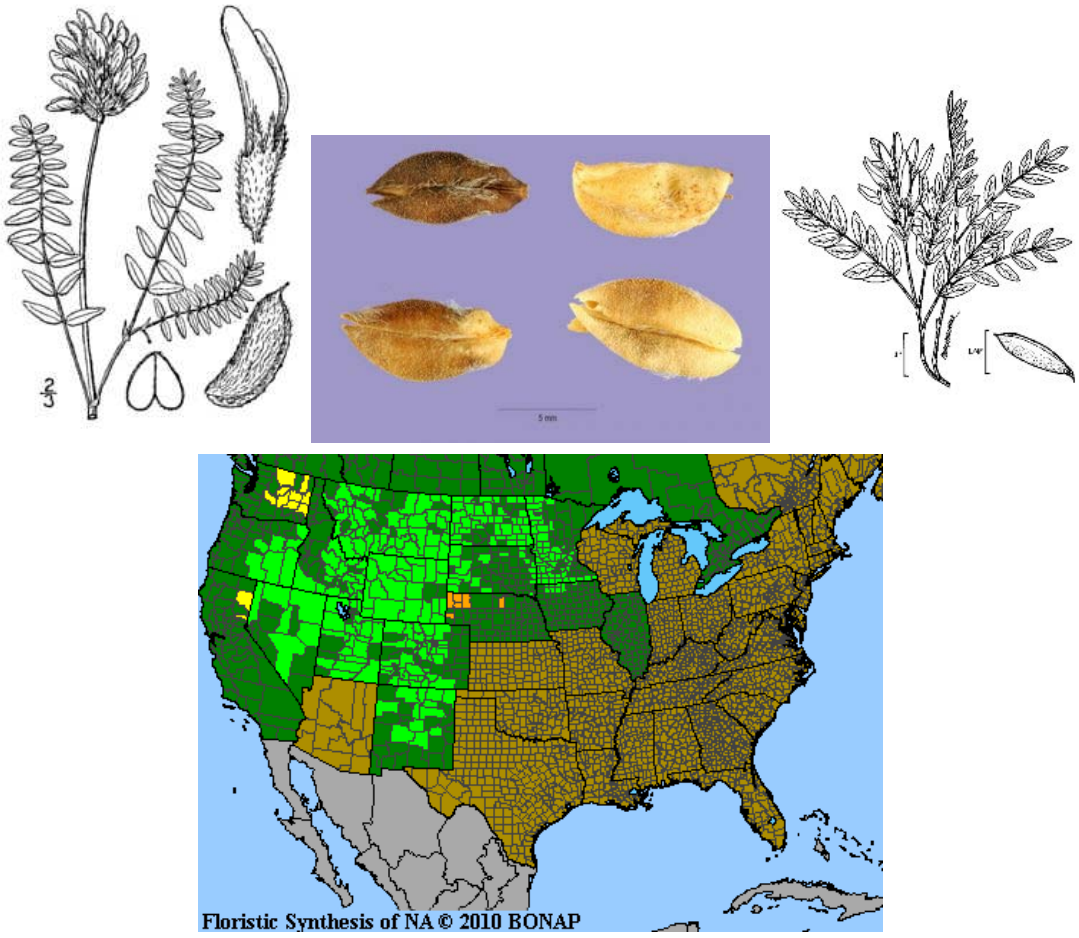
Astragalus spp are larval hosts of CASE-BEARER MOTHS of the genus *Coleophora*. The larvae initially feed internally on the seeds, flowers or leaves of the host plant but when larger they feed externally & construct distinctive protective silken cases. The genus is also larval host *Echinargus isola* REAKIRT'S BLUE BUTTERFLY, *Glaucopsyche lygdamus* SILVERY BLUE BUTTERFLY, *Lepotes marina* MARINE BLUE BUTTERFLY, & *Thorybes bathyllus* SOUTHERN CLOUDYWING SKIPPER.

Add section on horses, high N2 plants in a low N2 prairie, & protein and being a little loco is better than starving.

Dry seed stored in a refrigerator retains viability for years. Scarify seed. Seedlings quickly form taproot. Code A, I. (cu00)

Astragalus agrestis Douglas ex G Don FIELD MILK VETCH, AKA PURPLE MILKVETCH, (*goniatus -a -um* angled, cornered, Greek γωνία, *gonia,* angle, & *-atus*, Latin suffix indicating possession, likeness of, or 'provided with'.)

Habitat: Prairies, moist meadows, & margins of lakes. distribution/range: Native to western U.S, adventive in Boone Co, Illinois (m14).
Culture:
Description: Native, erect, herbaceous, perennial forb; stems slender, 1-3 dm tall, mostly single, glabrous or sparsely strigose; roots slender elongate rhizomes; leaflets 13-19, linear-oblong to lanceolate, sparsely pilose on both sides; inflorescences racemes, dense, 2-4 cm long, long-peduncled; flowers purple, about 17 mm long; calyx more or less black hirsute, the subulate lobes about half as long as the tube; pod obliquely ovoid, 7-9 mm long, densely hirsute, deeply sulcate on the lower margin; key features:
Comments: status: phenology: Blooms May - July.
Associates:
VHFS: [*Astragalus agrestis* L, *A agrestis* Douglas ex G Don, *A hypoglotis* L] [*Astragalus danicus* Retz var *dasyglottis* (Fisch. ex DC) B Boivin, *A dasyglottis* Fisch ex DC, *A goniatus* Nutt. *A hypoglottis* Hook]



Astragalus agrestis

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Pod & seed photos Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image (as *A hypoglotis*). Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Astragalus alpinus Linnaeus var **alpinus** *ME, MN, WI ALPINE MILK-VETCH, (*alpinus -a -um* belonging to the Alps, alpine, from Latin *alpinus*, adjective, of Alps, of mountains, of alpine regions.)
Habitat: An alpine to sub-alpine plant, an early seral colonizer. Calcareous or siliceous derived soils.
distribution/range: Circumboreal, North America & Eurasia. Spottily distributed from Canada south to northern Wisconsin, northern Minnesota, western South Dakota & south in the Rocky Mountains to New Mexico.

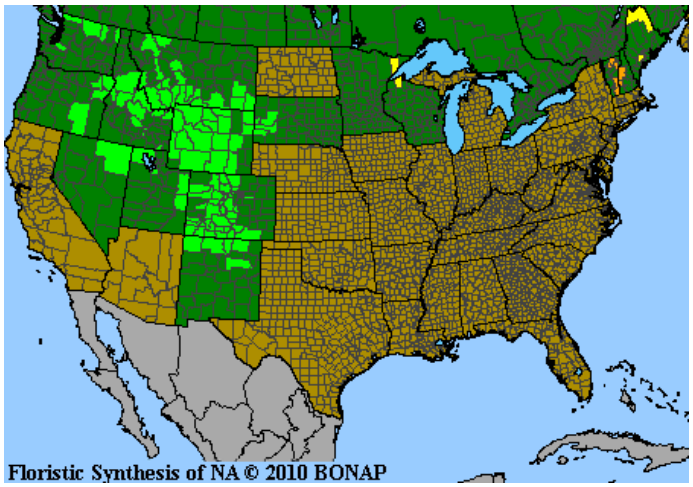
Culture: Seeds may require scarification. Forms a soil seed bank in Yellowstone Park. Full sun, moist soils.

Description: Erect, decumbent to ascending, herbaceous, perennial forb; 0.5 to 12 inches (1-30 cm) long, from a caudex with taproot, & slender, widely creeping & adventitiously rooting, slender, subterranean rhizomes; stems more or less decumbent, 2-5 dm tall, glabrous or thinly strigose; leaves ovate, 1.0-6.0: (3-15 cm) long, with 5-26 (15-29) leaflets, 4.0-20 mm (1-2 cm) long & 2.0-10 mm wide, sparsely pilosulous on both sides or glabrous above; inflorescences spreading racemes, long peduncled, 2-4 cm long, loosely few flowered, 5-30 flowers, 9.0-12 mm long much elongate at maturity; flowers pinkish to light blue (purple keel & white wings, purple or purplish), about 1 cm long, keel-petals exceeding the wings & about as long as the standard; calyx-tube broad, about 2 mm long, calyx-lobes triangular, about 1 mm long; fruits are pendulous pods, reflexed, lance-oblong, acute at both ends, 7.0-17 (10-13) mm long & 2.5-4.0 mm wide, more or less falcate, deeply sulcate on the lower side, on a stipe 3-4 mm long; nodules are 4-5 mm long. key features:

Comments: status: Special concern in Maine. Endangered in Minnesota & Wisconsin. phenology: Blooms Sp may be an important post fire sp, but its presence as a seed bank sp or as dormant rhizomes needs study. Associates: Larval host for *Colias hecla* HECLA SULPHUR & *Colias nastes,* the LABRADOR SULPHUR. CARIBOU, ARCTIC HARES, & GREATER SNOW GEESE graze ALPINE MILKVETCH. Grizzly bears forage underground parts. Sp has not been demonstrated to be poisonous. Nitrogen fixation. One search for mycorrhizae found none. Light fruits are dispersed by wind & water, staying afloat for 3-13 days. Realistically, how can a sp depend on water dispersing seeds down slope, yet maintaining an alpine habitat? Hmm.
VHFS: [*Astragalus alpinus* L subsp *alaskanus* Hultén, *A alpinus* L subsp *arcticus* Hultén, *A astragalinus* (Hook) A Löve & D Löve, *Atelophragma alpinum* (L) Rydb]

Variety *alpinus* has curved pods & calyx densely pilose with either dark or light hairs.

Michelle D Anderson, 2007. *Astragalus alpinus*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011 June 6].

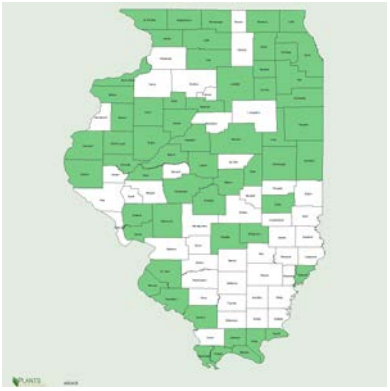


Astragalus alpinus

un-copyrighted draught

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Pod & seed photos Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. North America map courtesy of BONAP (2010)

Astragalus canadensis Linnaeus *MI, MA, VT CANADIAN MILK VETCH, aka CANADIAN RATTLEWEED, CAROLINA MILKVETCH, LITTLE RATTLEPOD, RATTLE VETCH, (*canadensis -is -e* (kan-a-DEN-sis) of or from Canada or NE USA. The epithet was formerly capitalized) [upl]



Habitat: Dry, sandy prairies & dry savannas. Moist prairies, open woodlands, roadsides, thickets, & streambanks. Commonly found in dry prairies, moist shores, riverbanks, marshy grounds & open or partly shaded ground (Voss 1985). Occasional in mesic prairies. distribution/range: Known from Siberia, most of central & southern Canada except some maritime provinces, & the lower 48 states except New England, Florida, & New Mexico. Known from Fairfield, Greenville, & Walnut Twps, Bureau Co & Agnew Prairie, Whiteside Co, but not mapped.

Culture: ①"Scarify seed then inoculate with *Astragalus* spec. 1, or fall sow. It is sometimes suggested to moist cold 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). ②Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (he99) ③No pretreatment needed. Scarify. Sow seeds just below the soil surface at 70ºF & water. (ew11) ④10 days moist stratification improves greenhouse germination, but not necessary. Field sow fall, spring, early summer. (pnnd). ⑤Shake in dry sharp sand or nick carefully with a file. Sow at 20ºC (68ºF), germinates in less than 2 weeks, better with inoculation agent (tchn). ⑥"Seeds should be sown in a cold frame as soon as they are ripe. Seeds should be pre-soaked for twenty-four hours in hot water before sowing. Germination can be slow but is usually within four to nine weeks if the seeds are sown fresh. When they are large enough to handle, place the seedlings into individual pots & grow plant them in the greenhouse for their first winter. Plant them into their permanent positions in spring or early summer." (USDA Plant Guide) Growth rate moderate. Seedling vigor medium. Vegetative spread rate slow. Seed spread rate slow. 120,000 (usda); 247,058 (gnh11); 256,000 (pn02, jfn04, shirley); 264,000 (ew11); 264,107 (gna06); 266,000; 275,000 average (usda); 270,500 (usda); 272,000 (pm02); 286,526 (gna05); 314,840 (gnam04) seeds per pound. As part of a mix, plant 0.10-0.25 pls lb per acre, or where higher densities are desired as along stream corridors, 1.0-2.0 pls lb (USDA Plant Sheet). Seed is usually in good commercial supply, but specific ecotypes will be limited. Buy or book seed early. Plants are not a mainstream item & will be scarce by late season. Plants do not like living in pots & do not overwinter well. Order early & order often.

⑦"Spring seeding should be done prior to May 15; dormant seeding after October 20. Seed should be mechanically scarified to break down dormancy due to hard seed coat. It is also desirable to inoculate seed with species-specific rhizobium for nitrogen fixing. Plant seed shallow at a depth of 1/2 to 3/4 inches into a firm seedbed. The preferred planting method is to use the legume box of a grass seed drill for the Canadian Milkvetch seed. Low rates of seed may need to be mixed with filler material for better seed distribution. The second method of choice is to mix the CANADIAN MILKVETCH seed with the other native spp in one of the other seed boxes. If seed settles to the bottom of the box, it should be added in frequent intervals rather than all at once. If conditions do not permit the use of a drill, double the seeding rate, broadcast the seed, & cover lightly by harrowing." (USDA Plant Fact Sheet) The recommendation to double the rate for broadcasting is an opinion, someone blindly repeating something they read somewhere, & not a fact.

cultivation: Space plants 18-24". Tolerant of medium textured soils. Clay soil tolerant. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance medium, with fruit/seed production strongly impacted by extended droughts, & plants may go dormant. Fertility requirement medium. Fire tolerance high. Salinity tolerance none. Shade intolerant. Full sun to part shade. pH 6.0-8.0. Sp does not like root disturbance; plugs & transplants should be planted in their permanent location. Lifespan of individual plants is said to be 3-4 years, but persistence can be enhanced by mowing or grazing (or deadheading) to prevent seed formation. USDA does not recommend planting in dry uplands, but in our experience, it does well locally on old Pleistocene sand dunes. It is also said to not like cold weather, but our local material has tolerated actual -34ºF temperatures.

bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but spring planting of inoculated, scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed. For

greenhouse/garden: Scarify & moist cold stratify 10 days, inoculate or dormant seed. Easy by winter broadcast on open soils. Germ 14.3, 8.0, 4.0, sd 13.1, r2.0-44 (42)%. Hard 78.6, 85, 93, sd 16.6, r48-95 (470%. Test 20, 20, 20, r12-31 days. (#18)**

Description: Native, erect, herbaceous, perennial forb, about as wide as tall, glabrous or slightly pubescent; from rhizomes, 10" minimum root depth; stems erect, 1.0-4.0(5.0)', up to 1.6 m tall, glabrous to thinly strigose, usually with several branches, divaricately branched, reddish in strong sun; leaves alternate, odd pinnate, stipulate, up to 12" long, with 15-35 (13-29, 15-31, 27-41) leaflets, oblong to elliptic (or oval), obtuse or slightly emarginate at the apex, rounded at the base, 1-2" (1-3 cm) long, 0.25-0.75" (5-15 mm) wide, pubescent above & below, less so above (or glabrous or rarely strigose above, more or less strigose beneath with malpighian hairs), decreasing in size towards the tip, peduncles longer than the leaves, or shorter; stipules membranaceous, broadly lanceolate , acuminate, 0.16-0.33" long; inflorescence racemes, long peduncled, dense, thick, tall, cylindric, axillary, to 8.0" (5-12 cm) long, 30-70 flowered, held above the upper leaves; stipules connate, lanceolate to deltoid, 3-6 mm long; flowers cream-yellow (creamy-white to greenish white or with a tinge of lilac, white or yellowish white, greenish-yellow), 5-merous, corolla papilionaceous, 0.50-0.62(-0.75)" long, stalked, spreading or somewhat reflexed; fruits are pods, numerous in a crowded raceme, oblong or ovoid, sessile, erect, inflated, coriaceous, dehiscent, glabrous, nearly terete or sometimes furrowed at the dorsal suture, pointed, nearly straight, 2-valved (or chambered), to 0.50 (0.41-0.67)" (1.2 cm, 10-18 mm) long, upright, persisting into winter; with ca. 10 seeds; N X = 16? key features: Inflorescence is a raceme held above the upper leaves; 15-35 oddly pinnate leaflets.

Comments: status: Endangered in Maryland. Threatened in Michigan & Vermont. phenology: Blooms 6,7,8; in a moist fall (as in 2012), this sp may have a somewhat remontant bloom, late August through September. Seeds mature mid-late summer. In northern Illinois, collect seeds in September - early November. Collect seeds in se Wisconsin in October (he99). Attractive cut flowers, dried seed heads. Landscaping uses specimen planting, very low water requirement. This plant is one of the largest sp of MILKVETCH. Seed source nursery production & remnants Fairfield & Walnut Twps, Bureau Co, & Amboy, Lee Co. Becoming rare.

"Uncommon in thickets & the edge of woods. Spring Creek woods northeast of Rockford, thickets east of Durand & the edge of woods on Meridian road near Cunningham road. Recently used as an erosion control plant in cuts & fills in road building as on Harrison road west of Cherry Valley." (ewf55)

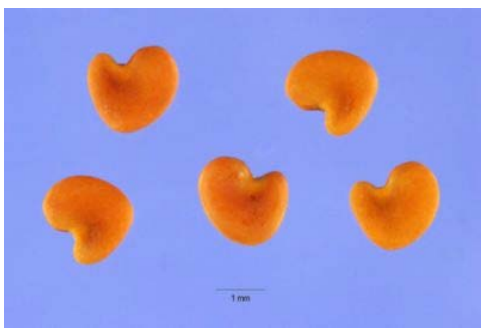
Associates: Butterfly larval host for EASTERN-TAILED BLUE BUTTERFLY. Attracts hummingbirds. Said to be deer resistant. USDA reports it is palatable to deer & livestock. N2 fixing rhizobial bacteria, fixation low.

CANADA MILKVETCH resembles some closely related LOCOWEEDS. LOCOWEEDS are typically western spp & they are of little concern in Illinois. ☠ Slight toxicity (USDA)

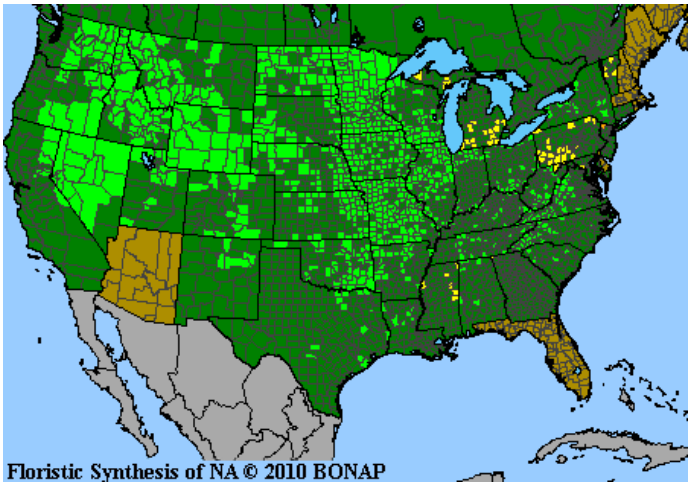
ethnobotany: Blackfoot dug the roots for food in the spring (Kindscher 1987). Used in broth. The root is analgesic & antihaemorrhagic & can be chewed or used as a tea to treat chest & back pains, coughs, & spiting up of blood. A poultice was made from the chewed root to treat cuts. (Moerman 1998)

VHFS: [*Astragalus canadensis* L var *carolinianus* (L) ME Jones, *A canadensis* L var *longilobus* Fassett, *A carolinianus* L, *A halei* Rydb] Var *longilobus* Fassett is known from Illinois.

'Sunrise' is a northern adapted USDA release.





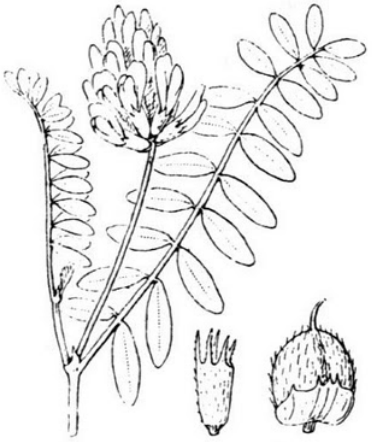



Astragalus canadensis

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant spp*. Not copyrighted image. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Astragalus cicer Linnaeus CICER MILKVETCH, aka CHICKPEA MILKVETCH, CICER, (*Cicer* classical Latin name for chickpea, from *cicer, ciceris* n., chick pea, probably *Cicer aristinum*. *Lathyrus* is Greek for chick pea.)
Habitat: Introduced escaped perennial forb. Native to Europe & Asia; rarely escaped from cultivation, Kane Co, Illinois (m14).

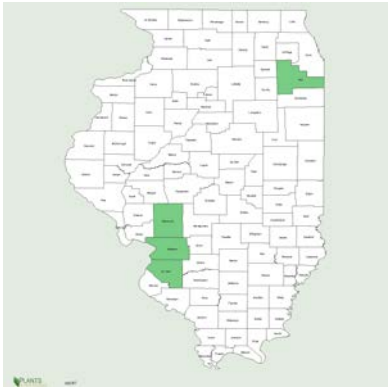
cultivation: Best in medium coarse to medium fine soils. Neutral to basic soils, some acid tolerance. Not established in Illinois, but sometimes planted in reclamation work.
Culture: Pure stand plant 20-25 lb pls per acre in spring or fall (gran). 145,000 (gran) seeds per pound.
Description: Introduced, erect, medium-tall, long-lived, herbaceous, perennial forb; spreading rhizomatous habit.
Comments: status: phenology: Useful for reclamation & erosion control. Slow to establish, but competitive in mixes over time. Fair drought tolerance, cold hardy, poor acid tolerance. Nonbloating. Commercial varieties are available.



Astragalus cicer

Line drawing public domain from Hippolyte Coste - Flore descriptive et illustrée de la France, de la Corse et des contrées limitrophes, 1901-1906. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image.

Astragalus crassicarpus Nuttall var **crassicarpus** *WI GROUND PLUM, aka BUFFALO APPLE, BUFFALO BEAN, BUFFALO PEA, BUFFALO PLUM, GROUND-PLUM MILK-VETCH, LARGE GROUND PLUM, PRAIRIE-PLUM, *Bi'jikiwi'bugesan,* cattle plum, (*crassicarpus -a -um* New Latin for thick-fruited, from Latin *crassus -a -um* thick, fleshy; solid, fat, dense, & Greek καρπός, *karpos,* fruit.)



Habitat: Dry to dry-mesic prairies. distribution/range: Manitoba to Saskatchewan south to New Mexico & Texas, plus a rare native in Illinois & Wisconsin. Possibly introduced eastward from the western USA. Variety *trichocalyx* (Nutt) Barneby is known from Illinois, which is often treated as a sp. *Vide infra.*

Culture: ①Moist cold stratify for 10 days (Wade). No pretreatment needed. Scarify. Sow seeds just below the soil surface at 70ºF & water. (ew11) ②"Seeds exhibit physical dormancy. Seeds are scarified. Germination occurs at 21º C." (bb02) 77,056 (wns01); 83,200 (pm02, aes12); 88,000 (ew11); 320,000 (sh94) seeds per pound. Seeds & plants are of very limited availability.

cultivation: Space plants 12-15".

Description: Native, decumbent or ascending, herbaceous, perennial forb, (4-)6.0-12(15-24)"; stems commonly several, sparsely pilose, 2-5 dm tall; from a stout caudex; leaves pinnate, 15-25(-31) leaflets, oblanceolate to elliptic, 8-15 mm long, cuneate at base, appressed pilose on both sides or glabrous above; inflorescence short raceme; flowers pinkish to bluish-purple (violet purple), about 2 cm long, calyx tube pubescent, 6-7 mm long, standard exceeding the wings & keel; fruits are thick-walled, glabrous, globose or oval, abruptly pointed, fleshy, indehiscent, red legumes (pods), 0.67-1.0" (ca 2 cm) diameter;

Comments: status: Endangered in Wisconsin. Variety *trichocalyx* is Endangered in Illinois. phenology: Blooms May - June. Pods develop in June. Collect seeds in se Wisconsin in June (he99). In South Dakota, pods are dry by August.

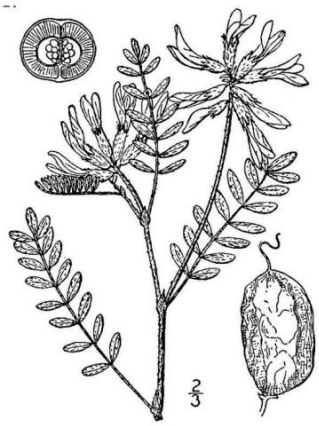
Associates: Larval host of *Erynnis afranius* AFRANIUS DUSKYWING SKIPPER. Plants are readily consumed by livestock. Fruits were collected by prairie dogs for their winter stores.

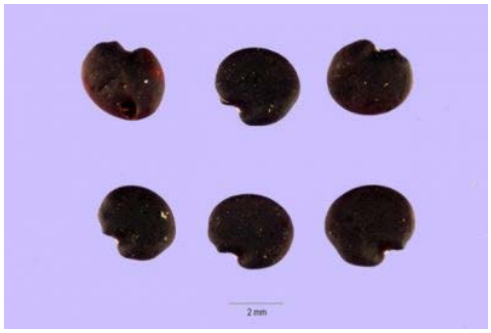
ethnobotany: Young pods are edible, roots are medicinal. Immature pods were used raw, cooked, or pickled. Listed by Densmore as Ojibwa medicinal plant for convulsions & hemorrhages from wounds, & noted as Chippewa tonic plant. Used as medicinal plant by Ojibwa (den28 as *A caryocarpus*).

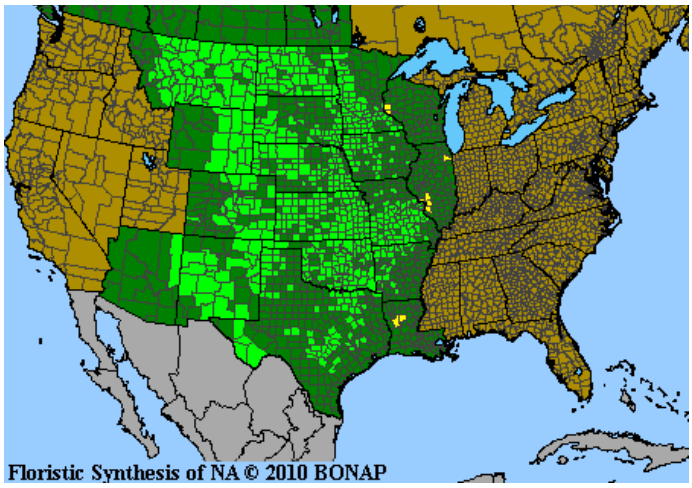
VHFS: In Britton & Brown (1913), this lists as *Geoprumnon crassicarpum*. [*Astragalus caryocarpus* Ker Gawl, *A succulentus* Richardson, *Geoprumnon crassicarpum* (Nutt) Rydb ex Small, *G succulentum* (Richardson) Rydb]

See also *Astragalus trichocalyx* Nuttall.

CC Baskin & JM Baskin, 2002. Propagation protocol for production of container *Astragalus crassicarpus* Nutt plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 9 June 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.



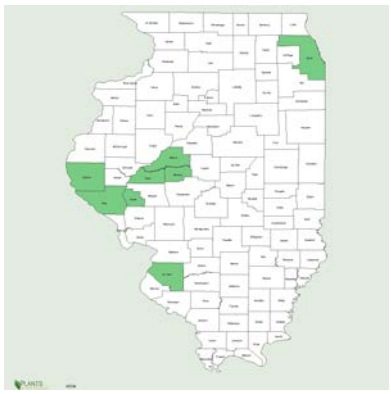




Astragalus crassicarpus

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Astragalus distortus Torrey & A Gray BENT MILK VETCH, aka OZARK MILKVETCH, (*distortus -a -um* distorted, twisted.)



Habitat: Rocky prairies. Dry prairies, barrens, & open woods. In western Virginia & West Virginia, it grows in shale barrens. distribution/range: Rocky prairies; rare in western Illinois, adventive in Cook Co, Illinois (m14). Noted by Mead in western Illinois prairies.

Culture:

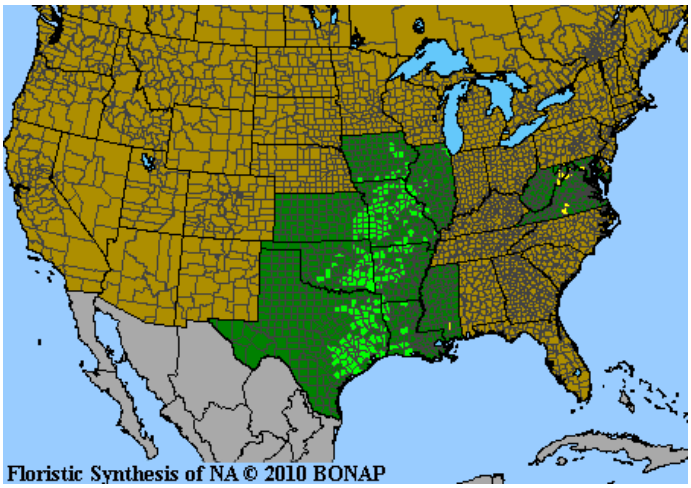
Description: Spreading, herbaceous perennial forb; stems 1-3 dm long, cespitose & spreading, glabrous or nearly so; from a stout vertical root; leaflets 13-25, elliptic to obovate, 3-10 mm long, often retuse, glabrous above, sparsely strigose beneath, inflorescence races 2-3 cm long, peduncles 5-1 cm long; flowers purple, 10-13 mm long; calyx strigose, the tube 2-3 mm long, the triangular lobes half as long; pods spreading, subsessile, lunate, linear, 2-3 cm long, about 4 mm thick, tapering to both ends, glabrous, sulcate on the lower surface & sometimes also on the upper; key features: Leaflets oblong-obovate, calyx teeth half as long as the tube, legume smooth, declinate

Comments: status: phenology: Blooms May - June.

Associates:

VHFS: [*Holcophacos distortus* Rydb]



Astragalus distortus

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Pod & seed photos Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Astragalus goniatus Nuttall see *A agrestis*

Astragalus neglectus (Torr & A Gray) E Sheldon *NY, OH, PA, WI COOPER'S MILK-VETCH, (*neglectus -a -um* neglected, disregard, overlooked, unobserved, insignificant.)
Habitat: Mesic forests. Lake Michigan shores on dolomite. Old fields, riverbanks, ravines, & lakeshores. Calcareous soils. In Michigan, known from alvar & oak barrens. Recently disturbed soils in forests, fields or prairies. "A variety of semi-shaded to open situations: lakeshores, stream banks, cool ravines; more rarely on limestone cliff ledges, limestone barrens, in savannas overlying limestone bedrock, or on steep, eroding shale slopes" (Ohio DNR) distribution/range: Native east, north, & northwest of our area. In Wisconsin restricted to counties on Lake Michigan.

Culture: ①10 days cold moist stratification (pm09).

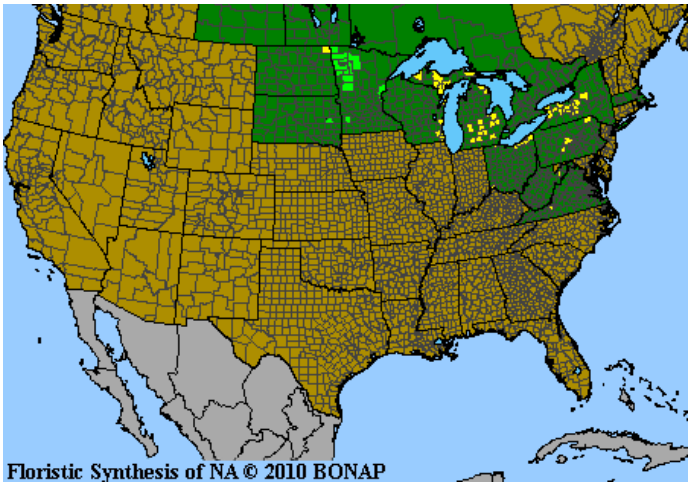
Description: More or less erect, perennial, native forb; stems erect, 1.0-3.0(-3.9)' tall, nearly or quite glabrous, branched; from a woody crown or caudex, taproot present, nodules present; stems clustered, leafy stem usually hollow; leaves odd pinnate, 11-23 (11-17,13-25), leaflets oblong to obovate or elliptical, 0.33-1" (1-3 cm) long, a fourth to a third as wide, glabrous above, with hairs beneath (strigose); inflorescences racemes, several, scarcely surpassing the subtending leaf, many-flowered, 10-20 stalked flowers per raceme; flowers corolla commonly white to cream, rarely yellow, 0.5" (1-2 cm) long, tubular pea-like, 5-merous, calyx tube cylindric, 4-6 mm long, strigose, the lobes about a third as long; fruits are legumes, erect, sessile, straight, fusiform or ovoid, inflated, glabrous, up to 0.75" (1-2 cm) long, 6.0-10 mm thick, slightly furrowed (scarcely sulcate) along sutures, 1-celled, changing from green to mottled purple, then to chocolate brown 11-many seeded; seeds cordiform, mitt-shaped, notched at one end, smooth surfaced, olive, brown, or black; N x = 11? key features: Racemes barely above the

upper leaves.

Comments: status: Endangered in New York, Ohio, Pennsylvania, & Wisconsin. phenology: Blooms June. Fruiting in July-September. "The pods of *Astragalus neglectus* rapidly change throughout the month of August from green to mottled purple, then to chocolate brown. The dark pods persist on the plant throughout the fall & winter, even after the leaves have dropped." (Sather 1999, Web-3).
Associates: Attracts hummingbirds.

The persistent, uneaten pods are another example of post-Pleistocene Rotting Fruit Syndrome. Like *A tennesseensis* (which see), this sp has lost its principal animal seed dispersing partners. In our rapidly changing world, this species will exist only as a garden species if at all.
VHFS: In Britton & Brown (1913), this sp is known as *Phaca neglecta.* [*Astragalus cooperi* A Gray, *Phaca neglecta* Torr & A Gray, *Tragacantha neglecta*]

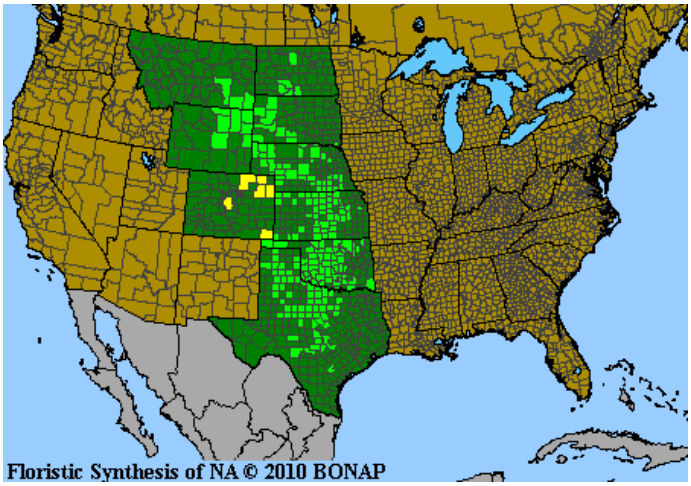
http://www.dnr.state.oh.us/Portals/3/Abstracts/Abstract_pdf/A/ASTRAGALUS_NEGLECTUS.pdf
http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/plant_Astragalus_neglectus-Coopers_Milkvetch.pdf
http://www.mnnps.org/newsletter/1999/Vol18_Num2_Winter_1999.pdf



Astragalus neglectus
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. North America map courtesy of BONAP (2010)

Astragalus plattensis Nuttall PLATTE RIVER MILKVETCH, (*plattensis -is -e* of or pertaining to the Platte River, in the Great Plains, or, possibly a derivative of *plattus,* flat, smooth, or its etymon ancient Greek πλατύς, *platys.*)
Habitat: Prairies & plains. distribution/range: North Dakota to Texas; reported from Iowa (?) & Minnesota (? check); reports from further east are erroneous.
Culture: ? There are no known commercial sources of seeds or plants.
Description: Native, prostrate or ascending, herbaceous, perennial forb, villous pubescent with spreading hairs; slender elongate rhizomes; stems often solitary, very slender, diffuse, or spreading, 0.5-1.0' high or long (1-3 dm

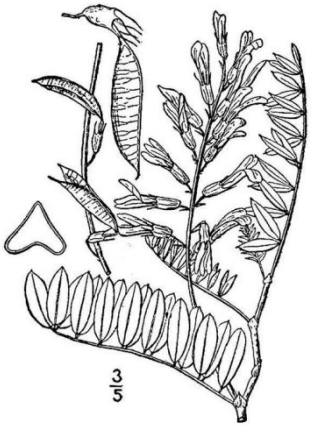
long); leaflets 15-25 (13-29), oblong to elliptic (obovate), obtuse at the apex, narrowed at the base, 0.33-0.75" (5-15 mm) long, 0.16" wide; in short heads; flowers purplish (yellowish-white or tipped with purple), about 0.75" (15 mm) long; pods ovoid, pointed, smooth, loosely pubescent, nearly straight 1.5-2.0 cm long, 2-celled, thick-walled; key features:
Comments: status: phenology: Blooms May - June.
Associates:
VHFS: In Britton & Brown (1913), this sp is known as *Geoprumnon plattense.* [*Astragalus pachycarpus* T&G, *Geoprumnon plattense* (Nutt) Rydb]

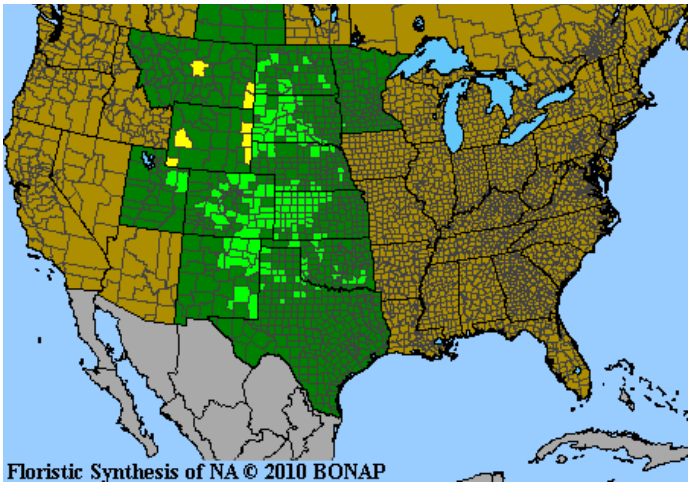


Astragalus plattensis
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Astragalus racemosus Pursh CREAM MILKVETCH, aka CREAMY POISON-VETCH, (*racemosus -a -um* (ra-kay-MO-sus) with a raceme, New Latin from Latin *racemus*, *recemus,* the stalk or a cluster of a bunch of grapes, & –*osus,* plenitude or notable development, for the elongated inflorescence, a cluster of flowers each on their own stalk & arranged along a single central stem.)
Habitat: Clayey soils in prairies that are lightly to moderately grazed. distribution/range: West of our area, the Great Plains & Rockies, from Saskatchewan to Texas & eastern New Mexico.
Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09)
Description: Erect or ascending, herbaceous, perennial, native forb, clumped appearance, covered with tiny appressed hairs; stems few, branched at the base, somewhat zig zag, 1.0-2.0' (4-10 dm) tall, finely strigulose; from a branched caudex (stout caudex-like root) with a heavy taproot; leaves pinnate, leaflets 17-31 (10-30?), linear to narrowly oblong, 1-2 cm long, glabrous above, minutely strigose below; stipules ovate-lanceolate, membranaceous, 0.16-.24" long; inflorescences are terminal racemes of 20-70 flowers, long-pedunculed, 5-8 cm long, lax; flowers ochroleucous (yellow-white) with purplish lines or tips; calyx-tube about 5 mm long, strigose; calyx lobes subulate, 2-3 mm long; fruits are flattish pods, drooping, linear, 1" (2-2.5 cm) long, glabrous,

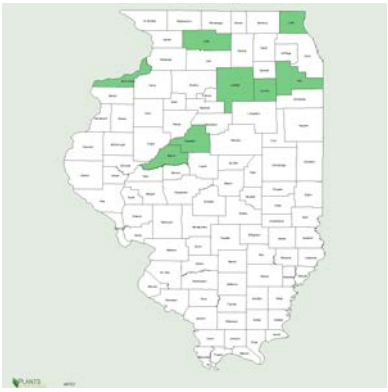
triquetrous, acute on the upper suture, widely sulcate on the lower; with dark brown seeds; key features:
Comments: status: phenology: Blooms 5-6.
Associates: Poisonous to livestock. When growing in soils containing selenium, sp is a selenium accumulator & may require selenium for proper growth. Ingestion may cause blindness, hemorrhaging, or paralysis.
ethnobotany: Used by the Lakota as a poison.
VHFS: [*Tium racemosum*]





Astragalus racemosus
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Astragalus tennesseensis A Gray ex Chapman * IL, IN, TN TENNESSEE MILKVETCH, (*tennesseensis -is -e* of or relating to Tennessee, USA.)
Habitat: Dry gravel prairies in its northern range, calcareous barrens & cedar-glades in the southern part of its range with full sun to partial shade (Baskin et al 1972). In ecotones between red-cedar glades & open rocky glades, in calcareous soil in shade, also in prairies. distribution/range: Illinois, Indiana, Tennessee, & Alabama. In northern Illinois, Manito Gravel Prairie, Tazewell Co, & formerly Will (DuPage in one source) Co. Illinois is at the most northern & western limit of the sp range.



Culture: ①Cold moist stratified 3-4 months at 34-36ºF (Horvath et al 2002). ②"Seeds exhibit physical dormancy. Seeds are scarified & germinate at 25 C." (bb02).
cultivation: Gravel to loamy gravel & sand. Mostly full sun but also prairie edge. Prescribed burns have demonstrated fire will stimulate germination. In nature, germination occurs in sparsely vegetated areas in late April through May.

Description: Native, erect or ascending, herbaceous, perennial forb, to 5", plant long white hairy (hirsute); sprawling stems, running along the ground for up to 20", stems usually several, erect or ascending, woody below, softly villous, 1-4 dm tall; from a woody crown or caudex (or stout root), deep rooted; leaves alternate, hairy (hirsute), pinnate, leaflets 15-25(-31), narrowly oblong or linear oblong (elliptic), obtuse or emarginate, glabrous or nearly so above, long pilose below, 0.50-1.0" (1-2 cm), but usually less than 1.0" long, 0.16-0.32" wide, stipules lanceolate, oval, or ovate-lanceolate, lower stipules membranaceous, broadly ovate, 7-10 mm long, peduncles about equaling the leaves; inflorescence a dense raceme, short, several-many-flowered 2.0-3.0" (5-8) cm long, axillary; flowers whitish or yellow-green (yellowish white), 0.83" (15-18 mm) long; calyx ca. 7 mm long, villous; fruits are legume pods, 2 celled, indehiscent, oblong, conic, curved, summit strongly curved, acuminate,1" long or more (2-3 cm), yellow brown, thick-walled & spongy, strongly wrinkled when dry, hairy; seeds olive, brown, or black; key features:

Comments: status: Endangered in Illinois. Reintroduced in Indiana. Special Concern in Tennessee. phenology: Blooms late April to early May. Seeds are ripe July. Leaves are shed in early autumn & the plant produces an overwintering rosette of leaves. Cross-pollination is necessary for seed set.

Sp may be negatively impacted by extreme drought or wet seasons. Drought reduces seed production. Prescribed burns may destroy unopened seedpods.

Associates: Primarily bumblebee pollinated. Black-headed, white insect larvae bore through stems just above ground level & may kill adult plants in spring. Negatively impacted by deer grazing. The thick & spongy legumes drop by the mother plant, but the seeds are not released for several years. Authorities assume wind & water are the dispersal agents for the sp.

"TENNESSEE MILK-VETCH is found along the margins of limestone cedar glades & barrens, & tends to be associated with trails, road sides (i.e. Moccasin Road, Cedar Forest Road), & other disturbed areas on glades. Occasionally, plants occur on isolated glades but such populations contain small numbers of individuals. Based strictly on observation on the State Forest, the sp tends to benefit from occasional disturbances & may use trails, roads, &c, as a means of dispersing its seeds.)"
http://www.tn.gov/environment/na/pdf/EACedarsofLebanonSF2003.pdf

This rare & declining sp is a classic example of post-Pleistocene Rotting Fruit Syndrome. The sp distribution is widely scattered, records are declining, & it may have never recovered its old range from the displacement of the last glacial advance. But most importantly, the fruits fall around the mother plant & rot, uneaten. Nature does not waste anything. Something used to eat those pods; something had eaten them ever since some *Astragalus* sp developed fleshy pods millions of years age. The sp has lost its most-recent dispersal partner during the early Holocene extinctions, 11,000 - 13,000 years ago. Some animal(s) used to eat the 'fleshy' pods, lightly chew & swallow them, digest the pod, & deposit adequate numbers of seeds in a nice pile of organic fertilizer, but at a respectable distance from mamma milkvetch. The animal would not have been a cud-chewer, like a deer or elk, but a hindgut processor. Perhaps an extinct turtle, or horse, or even a carnivore. After all, even jaguars like an avocado now & then.

VHFS: In Britton & Brown (1913), this sp is called *Geoprumnon plattense.* [*Astragalus plattensis* var *tennesseensis* (A Gray ex Chapm) A Gray, *Geoprumnon plattense* (Nutt) Rydb, *Geoprumnon tennesseense* (A Gray ex Chapm) Rydb]

Illinois plants have linear-oblong leaflets.

CC Baskin & JM Baskin, 2002. Propagation protocol for production of container *Astragalus tennesseensis* Gray ex Chapman plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 5 June 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

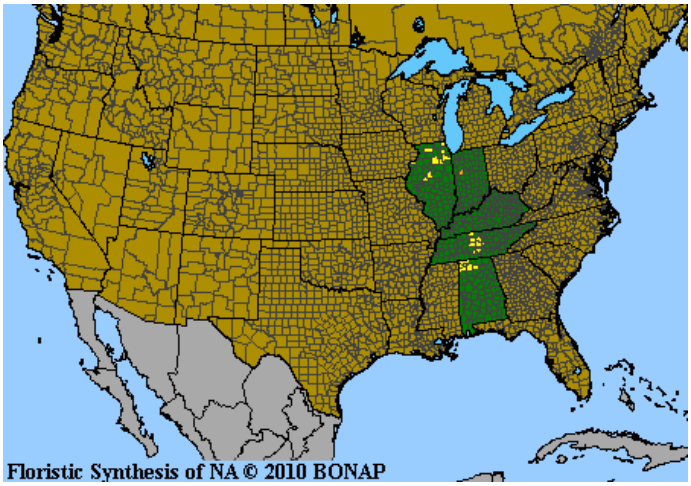
CC Baskin, JM Baskin & Elsie Quarterman, 1972. Observations on the ecology of *Astragalus tennesseensis*. The American Midland Naturalist. 88: 167-172.

CC Baskin & Elsie Quarterman, 1969, Germination requirements of seeds of *Astragalus tennesseensis*, Bulletin of the Torrey Botanical Club, Vol. 96, No. 3, May - Jun., 1969, pp. 315-321.

Adrienne Edwards, Bethany Wiltshire, & Daniel Nickrent, 2004, Genetic diversity in *Astragalus tennesseensis* & the federal endangered *Dalea foliosa* (*Fabaceae*), *Journal of the Torrey Botanical Society* 131(4), 2004, pp. 279–291.

DJ Horvath, G Blessman, & RM Flood, 2002. Propagation protocol for production of container *Astragalus tennesseensis* plants (1+0 container plugs); Illinois Department of Natural Resources - Mason State

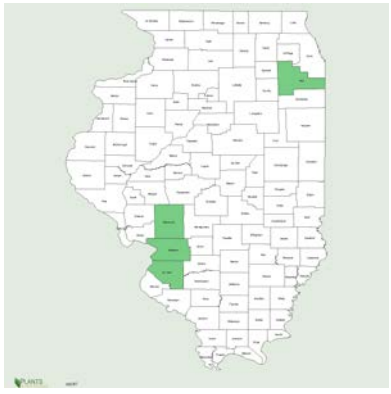
Nursery, Topeka, Illinois. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 5 June 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery http://dnr.state.il.us/conservation/naturalheritage/botany/htmlastr.htm



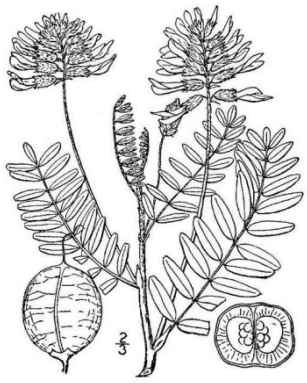
Astragalus tennesseensis

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov. North America map courtesy of BONAP (2010)

Astragalus trichocalyx Nuttall *IL, WI LARGE GROUND PLUM, aka BUFFALO PLUM, GROUND PLUM, GROUND PLUM MILKVETCH, GROUND -PLUM MILK-VETCH, HOG PLUM, LARGER GROUND PLUM, (*trichocalyx* trichoca'lyx (tri-ko-KAY-lix) New Latin hairy calyx, from Greek τριχος, *trichos*, a hair, & καλυξ, *kalyx*, cup.)
Habitat: Rocky prairies. distribution/range: Rare in Illinois, Macoupin, Madison, & St. Clair counties; adventive in Will Co.



Culture: ? There are no commercial sources of seeds or plants of this sp.
Description: leaflets 17-33, oblong to obovate, obtuse or emarginate at the apex, narrowed at the base; inflorescence short raceme; flowers yellowish-white or purplish at the tip, 0.75-1.0" long; pod thick, glabrous, globose, not pointed, 1.0-1.25" diameter, succulent, sweet-tasted; N. key features: Similar to *A crassicarpus* but less pubescent & with the hairs somewhat spreading.
Comments: status: Variety *trichocalyx* is Endangered in Illinois. phenology: Blooms April - May.
Associates: ethnobotany: Fruit edible. "Fruit as large as the plum, & eaten unripe by travelers, raw or cooked." as *A Mexicanus* in Wood (1873).
VHFS: Also known as *Astragalus crassicarpus* Nutt. var *trichocalyx* (Nutt) Barneby (M14). [*Astragalus mexicanus* A DC var *trichocalyx* (Nutt) Fern, *A crassicarpus* Nutt var *trichocalyx* (Nutt) Barneby, *Geoprumnon mexicanum* (A DC) Rydb, *Geoprumnon mexicanum* Rydb in Small]



Astragalus trichocalyx
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov.

Astragalus vexilliflexis BENT-FLOWERED MILKVETCH, (*vexilliflexus -a -um* Modern Latin with the standard (the upper central or banner) petal bent, from Latin *vexillum, vexilli* n., a standard, a flag, & *flexus, flexus* m., turning, winding; swerve; bend; turning point.)
Habitat: Rocky prairie knolls & ridges. distribution/range: The northern Great Plains from southern Alberta & Saskatchewan south to South Dakota & Wyoming.
Culture: ①Seeds germinate after a period of cold, moist stratification, 10 days, or dormant seeding in an outdoor location; seeds need scarification; legume, requires appropriate rhizobial inoculum (pm11)
Description: Low, bushy, herbaceous, perennial, native forb, to 12"; tufted or matted from a woody taproot; leaves 2" long, 5-17 leaflets 0.50" long; inflorescences are racemes, with 5-11 flowers; flowers pale to pinkish-purple, 0.38" long; fruits are legumes (pods) 0.38" long, bending towards base of plant when mature; seeds smooth, olive to black; key features:
Comments: status: phenology: Blooms 6-7. At high altitudes in the Rockies, its full height may be 1" tall.
Associates:
VHFS:

BAPTISIA Ventenant 1808 **BAPTISIA, WILD INDIGO, INDIAN BEANS, REDNECK LUPINE** *Fabaceae Baptisia* (bap-TIS-ee-a) from Greek βάπτω, *baptō*, dying, βαπτίζειν, *baptizein*, to baptize, to immerse, bathe, wash, drench, βάπτειν, *baptein,* to dip, plunge, bathe; some spp used as a poor grade indigo dye, as a substitute for *Indigofera tinctoria.* A genus of about 15 spp of perennial herbs from central & eastern North America, with leaves palmate, 3-5 leaflets, flowers white, yellow, or blue; legume inflated, stipitate, many (or by abortion)-seeded.

Illinois has 3 native spp & one that is generally considered adventive. The names of our local WHITE INDIGO & CREAM INDIGO have been scrutinized & have been recently revised. Some taxonomists feel these revisions are unwarranted. See the discussions under *Baptisia alba, B australis, B bracteata, B leucantha, & B leucophaea* in Weakley (2011, 2012, 2015)

Inoculate when transplanting. Useful for fresh cut flowers & dried arrangements. Good bumble bee forage & many spp attract butterflies. *Baptisia* are larval hosts for the following butterfly spp: ORANGE SULPHUR, CLOUDED SULPHUR, FROSTED ELFIN, EASTERN TAILED-BLUE, HOARY EDGE, & WILD INDIGO DUSKYWING. Fruit is an inflated legume with hard seeds, often parasitized by Bruchid beetles. Most spp are reported as deer resistant. Soil forming & nitrogen-fixing. *Baptisia* need both rhizobia & mycorrhiza to thrive. Attractive flowers, deep taproot. The eagerness to change the traditional scientific names of common Midwest *Baptisia* spp may be premature. For better or worse, many hybrid introductions are now available as ornamentals. The genus is already quite promiscuous in the nursery.

The true indigo plant *Indigofera tinctoria* Linnaeus was early introduced from the Indian subcontinent to the southeast USA for blue dye production.

Expand weevil discussion, often parasitized by Bruchid beetles; *Apion rostrum*, Baptisia Seed Pod Weevils, Wild Indigo Weevils, Say's Weevils. Align taxonomy w/ w15.

Baptisia leucantha / Baptisia leucophaea firmly scarify seed then inoculate with Baptisia spec. 1, or fall sow. It is sometimes suggested to moist cold 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.

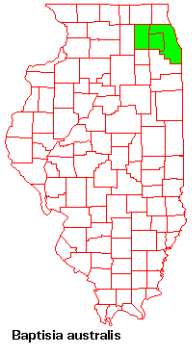
Genus propagation methods are float seed, scarify, moist cold stratify (10 days) or fall plant (pm09); germination may occur for an extended period. Burying seeds deeply may slow germination. Easy from scarified, inoculated & moist stratified seed. 90 days moist stratification required for good green house crop. Scarification necessary. (pnnd). Cullina (2000) recommends scarification or outdoor treatment. Seedlings grow slowly & resent being over-potted. Code A or B, I. Rooted cuttings fail to produce over-wintering crowns.

Plant breeders have released many selections, but where several *Baptisia* spp are growing in proximity, crosses occur naturally. (w11) Plants.usda.gov list 7 hybrids, with *B x serenae* mapped from Illinois. BONAP (2010) maps *B x deamii* from northeast Illinois & northwest Indiana.

Naturally occurring hybrid plants

Baptisia australis (Linnaeus) R. Brown ex Ait.f *IA?, IN, MA, NC, OH BLUE FALSE INDIGO, aka BLUE WILD INDIGO, *CANANDAIGUA*, FALSE INDIGO, GREAT WILD INDIGO, PLAINS BAPTISIA, PLAINS WILD INDIGO, PRAIRIE BLUE INDIGO, RATTLEBUSH, RATTLEBUSH WILD INDIGO, RATTLEPOD, SPIKED INDIGO WEED, WILD FALSE INDIGO, WILD INDIGO, (*australis -is -e* (ow- STRAH-lis) southern, of the southern hemisphere, from Latin *australis* southern.) upl

Habitat: Mesic & dry-mesic, moderate moisture, prairies & woods, in sandy, loamy soils. distribution/range: Considered introduced in Wisconsin (2 counties) & Illinois. Gardner (2011) considers it native in Illinois. Ilpin maps the sp from Kane, DuPage, & Cook counties, while variety *minor* is mapped from DuPage & Cook counties. Native to southeast USA.



Baptisia australis

Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (he99) ③Pour 180ºF water over seeds, let soak 2 to 3 days. Sow seeds ¼" below soil surface at 70ºF & water. (ew11) ④Pour hot water over seeds, let soak 1-3 days until swelling noticeable. Sow at 20ºC (68ºF) for germination in more than two weeks. Sensitive to damping-off. (tchn). ⑤Bb02 note seeds exhibit physical dormancy & were scarified & germinated at 25º/10ºC. 22,000 (ecs); 23,744 (wns01); 24,000 (pm02); 24,960 (ew11); 25,600 (pn02, jfn04); 26,895 (gna06); 28,117 (gnh02); 32,170 (gnh13); 50,928 (gna11) seeds per pound.

cultivation: Space plants 18-24". Full sun to light shade, but not shade tolerant. Humusy soils.

bottom line: Genesis seed tests indicate this seed typically has a significant percentage of hard seed &

may strongly benefit or require dormant seeding to establish a good stand, but spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant sow with inoculated, unscarified seed. Germ 28.5, 25, na, sd 23.5, r3.0-74 (71)%. Hard 53.5, 41, na, sd 27.5, r11-91 (80)%. Test 32, 31, na, r15-51 days. (#9)**

greenhouse & garden: Scarify & moist cold stratify (10 days), inoculate or dormant seed.

Description: Native, erect, herbaceous, perennial forb, 2'-4' tall, from multi-stem clumps that increase with age; leaves trifoliate; spikes of light blue to deep purple flowers, pea-like, 1", 5-merous.

Comments: status: Threatened in Indiana & Maryland. Endangered in Ohio. Var *minor* (Lehm) Fern is of Special Concern in Kentucky & Threatened in North Carolina. phenology: Blooms 5,6. C3. Seeds mature late summer. In northern Illinois, collect seeds in late August - October. Collect seeds in se Wisconsin in September - October (he99). This sp is a rare native plant in parts of the Midwest & considered non-native our area, but striking plant in the landscape. Attractive cut flowers & dried seed heads, great in the landscape as specimen plantings, borders, meadow plantings, naturalizing, & xeriscaping. BLUE INDIGO is reported to be aggressive in one west suburban Chicago-area remnant, West Chicago Prairie. Juvenile plants resemble juvenile *B alba.* It is not unheard of this seed being marketed as *B alba macrophylla*, with the results un-noticed for many years. Sp does well on exposed, low-humus, loamy sands. Seed source nursery plantings, genetic source St. Louis, Missouri area from Richard Clinebell.

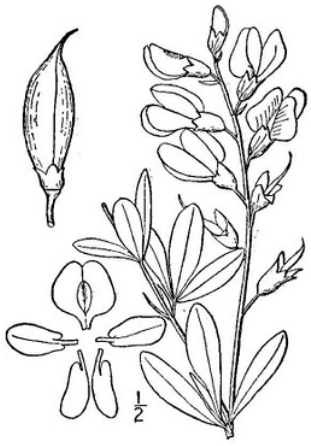
Associates: Pollinated by bumblebee queens & occasionally other visited by other long-tongued bees. Larval host plant for EASTERN TAILED-BLUE, ORANGE SULFUR, CLOUDED SULFUR, *Achelerus lyciades* HOARY EDGE; *Callophrys irus* FROSTED ELFIN, *Colias cesonia* SOUTHERN DOGFACE, *Dasylophia anguina* BLACK-SPOTTED PROMINENT, *Erynnis baptisiae* WILD INDIGO DUSKYWING. *Apion rostrum* WILD INDIGO WEEVIL grubs eat seeds & adults feed on flowers & leaves. The flowers on our plants are subject to nectar thieves, chewing holes in the lower side of the flowers, with very little to no subsequent pod formation or seed set. Provides food & cover for wildlife. Deer resistant, leaves are somewhat poisonous to mammals.

VHFS: Illinois has var *australis* & *minor* (Lehm) Fern. Variety *australis* TALL BLUE WILD INDIGO, STREAMSIDE BLUE INDIGO ranges from Wisconsin, Illinois, Kentucky, Tennessee, & Alabama eastward. Variety *minor* ranges from Illinois west to Nebraska, & south to Missouri, Kentucky, Arkansas, & Texas, also known from Ontario, but is said to reach its native eastern limit in Missouri. These varieties are allopatric. Variety *aberrans* (Larisey) M Mendenhall EASTERN PRAIRIE BLUE WILD INDIGO, GLADE INDIGO, is native south & east of Illinois. Var *minor* is often treated as a species, which see (m14).

Read the interesting taxonomic discussion under *B australis aberrans* in Weakley (2012). It is a var *minor*-like taxon growing in eastern prairie-like habitats within the range of var *australis*.

Several apparent hybrids with *B leucophaea* & *B tinctoria* are known from Whiteside Co. "A hybrid of this sp with *B bracteata* has been observed by Prof AS Hitchcock in Kansas" (Britton & Brown 1913). We have several blue, light blue, purplish-blue hybrids in our production plantings. Some that we think are growing known cultivars, but these are self-sown plants.

CC Baskin & JM Baskin, 2002. Propagation protocol for production of container *Baptisia australis* (L) R. Br. ex Ait. f plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 27 April 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.





Baptisia australis

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy ILPIN.

Baptisia australis (Linnaeus) R Brown var **minor** (Lehmann) Fernald; alternately **Baptisia minor** Lehmann *KY, NC BLUE WILD INDIGO, aka BLUE FALSE INDIGO, LESSER FALSE INDIGO,

Habitat: Full sun, dry soils. In Missouri, limestone glades & prairies.
distribution/range: Native south & west of our area, its native range reaching its eastern limit in Missouri. Recorded from Cook & DuPage counties in Illinois. Ilpin maps variety *minor* from DuPage & Cook counties, while the sp is mapped from Kane, DuPage, & Cook counties. Hmm.
Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Pour 180ºF water over seeds, let soak 2 to 3 days. Sow seeds ¼" below soil surface at 70ºF & water. (ew11) Several years to establish from seed. 24,000 (ew11) seeds per pound.

cultivation: Space plants 24-36". Easy in average, dry to medium, well-drained soil in full sun to part shade, but best in full sun. Tolerant of heat, drought, & poor soils. Zones 3(4)-8. Clumps slowly expand every year, mature plants have a shrubby appearance, opening up after flowering. Established plants should not be disturbed.
Description: Erect, herbaceous, perennial, native forb 1.5-2.0', 1.5-2.0' spread; deep extensive root system; leaves trifoliate, leaflets to 1.5" long, bluish; inflorescences are erect racemes to 12" well above the foliage; flowers purple, lupine-like; followed by inflated seed pods to 2.5" long, charcoal black when ripe; N. key features: Variety *minor* differs from the sp by being a smaller plant with shorter stems, shorter leaves but larger flowers
Comments: status: Special Concern in Kentucky. Threatened in North Carolina. phenology: Blooms May – June. This variety is ½ the height of the sp. The dried flower spikes are highly ornamental & attractive in dried arrangements. Great plant in the landscape as a specimen, borders, & naturalized, with showy flowers & fruits; spikey architectural form.
Associates: Attracts butterflies. Reported as deer resistant. No major insect or disease problems.

Children used dried flower spikes as rattles, shaking the dried seeds in their pods. "If plant is eaten in early spring in sufficient quantities, it is capable of causing poisoning among horses & cattle" (Ilpin).
VHFS: Variety *minor* is often sold by nurseries as *B australis* 'Minor' or *B minor*.
Illinois map courtesy plants.usda.gov.

Baptisia leucantha Torrey & A Gray

In some taxonomies, this is **Baptisia alba** (Linnaeus) Ventenat var **macrophylla** (Larisey) Isely *MI WHITE WILD INDIGO, aka INDIAN BEAN, LARGE-LEAVED WILD INDIGO, MILKY WHITE INDIGO, WHITE FALSE-INDIGO, WHITE REDNECK LUPINE, *B leucantha* Torrey & A Gray is probably the correct name. (*leucanthus -a -um* leucan'thus (lew-KAN-thus) white-flowered, with white flowers, from Greek *leukos,* bright, brilliant, clear, white, pale, & Greek ανθος, *anthos*, flower, & *–us*, a Latinizing suffix.) (*albus -a -um* (AL-bus) from Latin *albus*, white, adj, 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, far, *-o-*, & φυλλον, *phyllon*, leaf, foliage, & *–us*, Latinizing suffix).

Habitat: Wet-mesic, mesic, & dry-mesic prairies, & mesic savannas.
distribution/range: Throughout Illinois. *B leucantha* is western, and *B alba* is an eastern sibling.

Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (he99) ③Pour 180ºF water over seeds, let soak 2 to 3 days. Sow seeds 0.25" below soil surface at 70ºF & water. (ew11) ④Pour hot water over seeds, let soak 1-3 days until swelling noticeable. Sow at 20ºC (68ºF) for germination in more than two weeks. Sensitive to damping-off. (tchn). 25,536 (wns02); 25,600 (pn02, jfn04, aes12); 26,565 (gnh06); 27,177 (gna11); 27,200 (pm02, ew11); 28,419 (gnh02); 28,698 (gna04); 29,896 (gna05); 31,000 (gn); 33,360; 41,772 (gna05); 47,544 (gna06) seeds per pound.

"*Baptisia leucantha* General prairie. Blooms mid June to early July; WHITE. harvest September – October. Foliage 2 1/2', inflorescence to 4'; method #1. Successful by SEEDLING TRANSPLANT, & by SPRING BROADCAST. Legume, inoculate. Some seedlings damp off. Shoots come up late in field each spring." (rs ma)

cultivation: Space plants 18-24". Full to partial sun, dry to mesic prairie & woods. Best in sandy & loamy soils. Tolerates clay soils.

bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed. Easy from scarified seed. Inoculation is important, but mycorrhizae are also very necessary in rebuilt urbane soils. Germ 11.3, 8.0, 5.0, sd 10.9, r2.0-44 (42)%. Hard 73.8, 78, 78, sd 15.0, r31-90 (59)%. Test 32, 33, 49, r18-49 days (#27)**

Description: Native, erect, herbaceous, perennial, forb, 3'-5' tall, mostly smooth, bush-like, peony structure; root minimum depth; stems with many branches toward the top but below the inflorescence; leaves palmately-divided into 3 leaflets, silvery green, drying to a gray-black color; inflorescence a 8.0-20+" long, erect, spike-like raceme with the small, deciduous leaves (bracts) below the inflorescence less than 0.50" long; flowers white, 5-merous, 0.50-0.75" long, stalks less than 0.25" long; fruit blackish-brown, inflated, cylindrical, erect pod; N. key features: ①Plant mostly smooth; long, erect raceme; deciduous leaves or bracts below the inflorescence less than ½" long.

Comments: status: phenology: Blooms 6,7,8. Seeds mature early fall. In northern Illinois, collect seeds in late August - November. Collect seeds in se Wisconsin in September (he99). Landscaping, specimen plantings, herbaceous borders. Attractive seed pod clusters, useful in dried arrangements. Allow several years to flower from seed or plugs. Seed source railroad remnants & restored prairies, Lee Co, & nursery plantings, genetic sources Shaw Station, Lee Co & Milton Twp, DuPage Co. In 2011, our recently no-till seeded juvenile *Baptisia leucantha* plants emerged 2-4 weeks earlier than established adult flowering spears. The adults are from northwest Illinois genetic material, but the prepubescent juveniles are from DuPage Co genetic material from Russell Kirt. "A sturdy plant", some liken its structure to a peony bush. "A common & showy prairie plant." (ewf55)

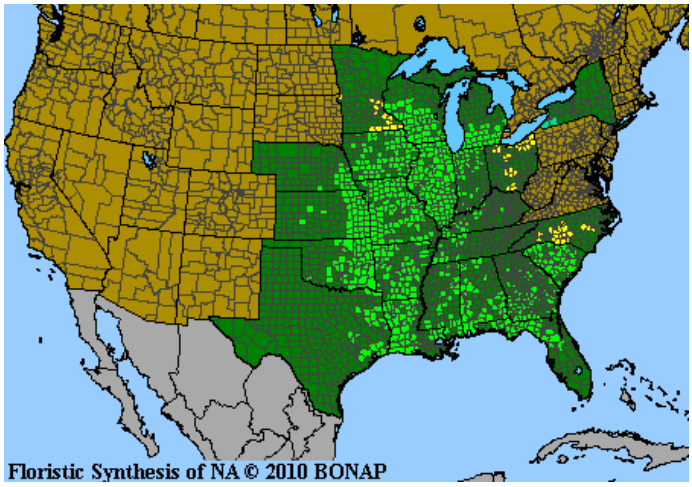
"There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation that any others, … *Baptisia leucantha* Torr & A Gray." (Short 1845)

Associates: Pollinated by bumblebee workers. Reported to be deer resistant.
VHFS: The sp was originally published as *Crotalaria alba* Linnaeus 1753. Forever known and forever in our hearts as *B leucantha*.

[*Baptisia lactea* (Raf) Thieret var *lactea*, *B leucantha* Torr & A Gray, *B leucantha* Torr & A Gray var *divaricata* Larisey, *B leucantha* Torr & A Gray var *pauciflora* Larisey, *B pendula* Larisey var *macrophylla* Larisey, *Dolichos lacteus* Raf]

It may be more appropriate to refer to *Baptisia alba* as eastern (southeastern) & *Baptisia leucantha* as Midwestern & western. Weakley (2011) states *B leucantha* is a western sibling treated as either a sp or a variety of the former. Woods (73) limits *alba* this to Va to Fla & notes "the whole plant does not blacken in drying". Ours does!

Several ornamental selections are known including *Baptisia alba* var *alba* 'Wayne's World' (Wayne's World Redneck Lupine)



Baptisia leucantha, note leafy infructescense

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Pod photo Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov. National map courtesy of BONAP (2010).

Baptisia leucophaea Nuttall This is commonly placed as a variety in *Baptisia bracteata* Muhl. ex Elliott var *leucophaea* (Nuttall) Kartesz & Gandhi. *MI CREAM WILD INDIGO, aka BLACK RATTLEPOD, BUFFALO PEA FALSE INDIGO, CREAM FALSE INDIGO, CREAMY WILD INDIGO, LONG-BRACTED WILD INDIGO, PLAINS WILD INDIGO, (*leucophaeus -a -um* grayish-white, light gray, from *λευχος, leucos,* bright, brilliant, clear, white, pale, *-o-*, a connecting vowel for Greek words, & *phaeos*, from φαιος, *phaios*, dusky, gray, & *–us*, a Latinizing suffix; also ashen, pale brown, from λευκο-φαιος.) (*bracteatus -a -um* bractea'tus (brak-tee-AY-tus) New Latin for bracted, bracteate, bearing bracts, or modified leaves immediately below the calyx, or on the peduncle, from Latin *bractea,* a thin metal plate, gold leaf, & *-atus*, Latin suffix indicating possession, likeness of) (*glabrescens* glabrescent, becoming glabrous, becoming smoothish, becoming hairless or slightly so, Latin *glabrescent-em*, present participle of *glabrescĕre,* to grow smooth or glabrous, or from Latin *glaber, glabra, glabrum*, hairless, smooth, & *-escens,* Latin adj suffix from *escentia*, translated as -ish, -part of, -becoming, -becoming more; said of surfaces that are hairy when young but becoming smooth when mature.) upl.

Habitat: Mesic, dry, & sand prairies. Prairies & open woodlands. "Common in the wild prairies, W. States and southward (w73). distribution/range: Our taxon is geographically distinct from the southeastern *B bracteata.* KBNMFBC.

Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (he99) ③Pour 180ºF water over seeds, let soak 2 to 3 days. Sow seeds 0.25" below soil surface at 70ºF & water. (ew11) ④Pour hot water over seeds, let soak 1-3 days until swelling noticeable. Sow at 20ºC (68ºF) for germination in more than two weeks. Sensitive to damping-off. (tchn). 22,400 (pm02); 25,600 (ew11); 27,200 (pn02, jfn04, sh94, aes12); 30,766 (gnam07); 32,269 (gnh13); 33,599 (gnh11) seeds per pound.

"*Baptisia leucophaea* Mesic to dry prairie. Blooms mid May to early June; CREAM. Harvest September - October. 1 1/2'; methods #1 & #2, some seedlings damp off. Successful by SEEDLING TRANSPLANT & SPRING BROADCAST. Legume, inoculate. Shoots come up late. An exquisitely beautiful plant at any stage. Foliage exquisite; one of best for garden use." (rs ma)

cultivation: Space plants 18-24". Full sun to partial shade, dry to mesic soils.

bottom line: Genesis seed tests indicate this seed often has high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed. Greenhouse & garden: Scarify & moist cold stratify 10 days, inoculate or dormant seed. Germ 15.5, 7.5, 4.0, sd 18.5, r3.0-61 (58)%. Hard 76, 82, 82, sd 21.2, r24-92 (68)%. Test 30, 27, na, r14-49 days. (#9)**

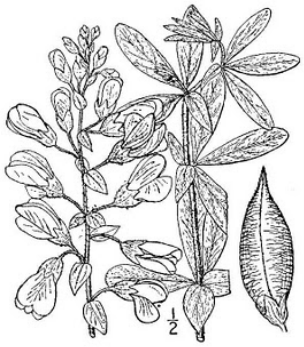
Description: Erect, herbaceous, perennial, native forb, 10"-32" tall, short hairy; roots; stems plant breaks easily when dry & is tumbled by the wind leaves palmately-divided into 3-5 leaflets with the stipules at the base appearing as 2 additional leaflets, dries to a gray-black color; inflorescence a 4.0"-8.0" long, drooping raceme with the small, permanent leaves (bracts) below the inflorescence greater than 1/2" long; flowers cream to yellow, 5-merous, 0.75-1.0" long, stalks 0.5-1.50" long; fruits are elliptical, fuzzy pods with a pointed beak; N. key features: ①Plant fuzzy; drooping racemes, permanent leaves or bracts below the inflorescence greater than 1/2" long; stipules appearing as 2 additional leaflets. ②Stipules & bracts large, triangular-ovate, raceme nodding, the many flowers turned to the upper side, legume ovoid or roundish (w73).
Comments: status: Native. Endangered in Michigan. phenology: Blooms late April - June. In northern Illinois, collect seeds in late August - October. Collect seeds in se Wisconsin in August - September (he99). Landscaping. Attractive cut flowers & dried seedpod clusters useful in dried arrangements. Genetic source Amboy Twp & Shaw Station, Lee Co. Often becomes a tumbleweed in winter. Some say it does poorly on exposed soils, but ours in such a location were the first of our plantings to bloom on our farm. Said to be "prone to wind damage???" by one source. "Tortoise-like" mounds of gray-green foliage. Spring 2010 many of our plants had exceptionally pale flowers, almost white.

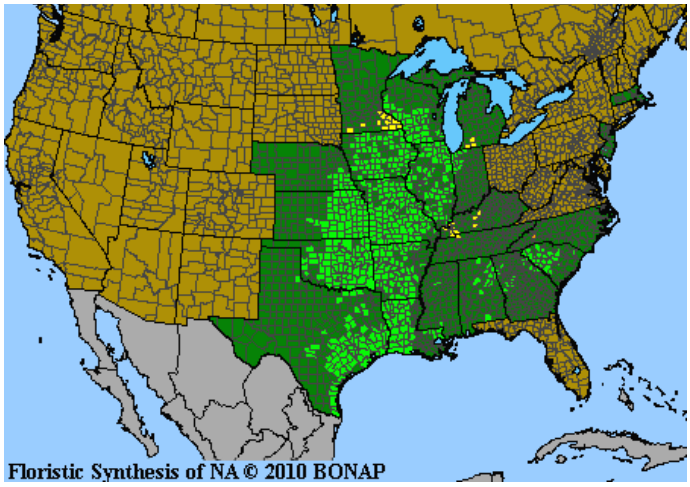
"This is also common on prairies but is a lower & more spreading plant than the preceding (*B leucantha*) & the flowers are more yellow. It resists grazing for many years. The pods of this & *Baptisia leucantha* are infested with a long-nosed black beetle, probably a *Mylarbia*." (ewf55)

Associates: Pollinated by bumblebee queens. Reported as deer resistant.
VHFS: [*Baptisia bracteata* Muhl ex Elliott var *leucophaea* (Nutt) Kartesz & Gandhi, *B leucophaea* Nutt, *B leucophaea* Nutt var *glabrescens* Larisey] Add varieties

According to (Mendenhall (1994), in Weakley 2011), our more western *B leucophaea* Nuttall is better treated as a sp than as *Baptisia bracteata* Muhl ex Elliott var *leucophaea* (Nutt) Kartesz & Gandhi.

MG Mendenhall, 1994, Phylogeny of *Baptisia* & *Thermopsis* (*Leguminosae*) as inferred from chloroplast DNA & nuclear ribosomal DNA sequences, secondary chemistry, & morphology. PhD dissertation, Univ of Texas at Austin.

Baptisia bracteata

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov. National map courtesy BONAP (2010). Note the western *leucophaea* and the isolated southeast populations of *bracteata*.

Baptisia sphaerocarpa Nuttall LARGE YELLOW WILD INDIGO, aka BUSH PEA, FALSE YELLOW INDIGO, GREEN WILD INDIGO, YELLOW BAPTISIA, YELLOW WILD INDIGO, YELLOW WISTERIA,
Habitat: Woodlands & prairies. distribution/range: Native south & southwest of our area.
Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Pour 180ºF water over seeds, let soak 2 to 3 days. Sow seeds ¼" below soil surface at 70ºF & water. (ew11)
cultivation: Space plants 24-36". Full sun, medium to dry soils. Tolerates poor soils.
Comments: status: phenology: Blooms Drought tolerant. Drop dead gorgeous. 28,800 (ew11) seeds per pound.
Plants respond to good soil & fertilizer in flowerbeds. One grower reports a plant 2' tall, 4' wide with over 130 flower spikes.
VHFS: [*Baptisia viridis* Larisey]

Baptisia sphaerocarpa

Pod photo Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image.

Baptisia tinctoria (Linnaeus) R Brown ex WT Aiton *IA, WI YELLOW WILD INDIGO, aka CLOVER BROOM, HONESTY-WEED, HORSE-FLEAWEED, HORSEFLY-WEED, INDIGOBROOM, INDIGOWEED, RATTLE-BUSH, RATTLEWEED, SHOOFLY, WILD INDIGO, YELLOW BROOM, (*tinctorius -a -um* tinctor'ius (tink-TORE-ee-us or tink-TO-ree-us) New Latin, of or pertaining to dyes or able to dyeing, used in dyes, or used in dyeing, from Latin *tingo*, *tingere*, *tinxi, tinctus,* to wet, to soak in color; to dye, & *-orius,* capability, functionality or resulting action, as in tincture; alternately Latin *tinctōrius* used by Pliny, from *tinctōrem,* dyer; at times, referring to a plant that exudes some kind of stain when broken.) *Baptisia tinctoria* is a botanical tautonym of sorts, but the genus is from Greek & the specific epithet is from Latin. upl
Habitat: Open, acid sandy woods, moist sandy woods. distribution/range: Sandy woods, very rare; Cook, DuPage, & Kankakee cos, Illinois (m14). Northeast Illinois is at the northwest limit of the sp range. Very rare in Iowa, Minnesota, & Wisconsin.
Culture: ①Seeds need scarification. 10 days cold moist stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②Pour 180ºF water over seeds, let soak 2 to 3 days. Sow seeds ¼" below soil surface at 70ºF & water. (ew11)

72,727 (gn); 80,000 (ew11) seeds per pound.

cultivation: Space plants 18-24". Full sun to part shade, medium to dry soils.

bottom line: Genesis seed test data indicate this seed often has a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant sow with inoculated, unscarified seed. Germ 6-21%. Hard 50-74%, Test 26-29 days. (#2).** greenhouse & garden: Scarify & moist cold stratify 10 days, inoculate or dormant seed.

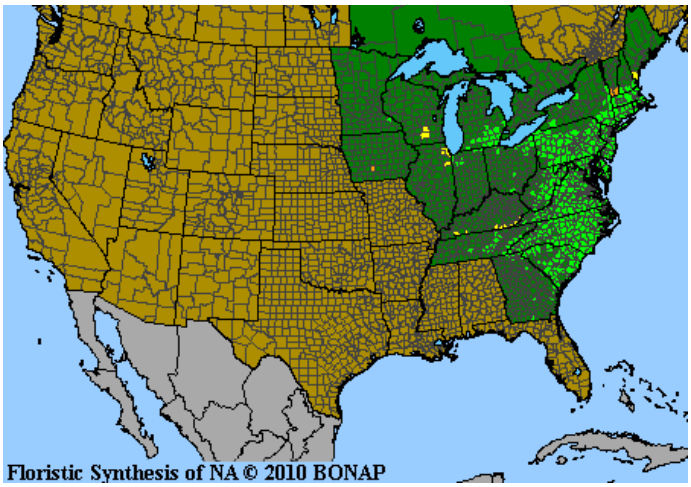
Description: Erect, herbaceous, perennial, native forb, 3.0-4.0', bushy, inflorescence numerous short terminal clusters; flowers yellow, 5-merous, 0.50" long; fruits are roundish, small pods, mostly single-seeded. key features: Leaflets roundish-obovate, raceme loose, terminal (w73).

Comments: status: Special concern in Wisconsin. phenology: Emerges May. Flower buds form May. Blooms 6,7,8, at the same time as *B leucantha.* Seeds mature fall. Sp was long considered extirpated in Illinois, but it has recently been relocated. Seed source nursery production, genetic source Pennsylvania.

Associates: Attracts bumblebees.

VHFS: Illinois material is var *crebra* Fern.

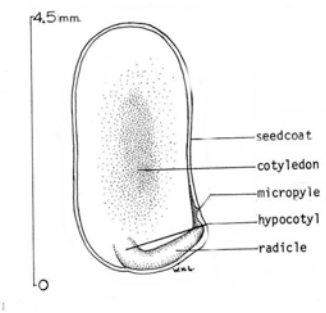
[*Baptisia gibbesii* Small, *B tinctoria* (L) R Br var *crebra* Fern, *B tinctoria* (L) R Br var *projecta* Fern, *Sophora tinctoria* L] Hybrids with *B australis* are known from Whiteside Co.



Baptisia tinctoria

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Map courtesy BONAP (2010).

CARAGANA Fabricius **CARAGANA, PEA-TREE, PEASHRUB** *Fabaceae Caragana* Modern Latin from a Mongolian name; alternately of Turkic origin (OED).

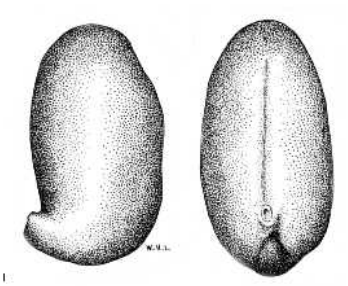


Line drawing WHL @ USDA-NRCS PLANTS Database.

Caragana arborescens Lamarck PEA-TREE, aka PEA-BUSH, SIBERIAN PEA-SHRUB, SIBERIAN PEE TREE, (*arborescens* (ar-bo-RES-enz) becoming tree-like, woody or tree-like.)

Introduced & escaped deciduous shrub. In the 1960's, this shrub was promoted for conservation plantings, & distributed by BSA Troop 61, Manlius, Illinois. Beautiful in flower. "This plains shrub is used here to a very limited extent for hedges. In the northwest, it is in common use & frequently escapes to fencerows. We have found it growing profusely as an escape on a sand dune just below Sugar River Forest Preserve where it makes a good sand stabilizer. Native of Siberia." (ewf55)





Caragana arborescens

Pod photo USDA-NRCS PLANTS Database - Not copyrighted image. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Line drawing WHL @ USDA-NRCS PLANTS Database.

CLADRASTIS Rafinesque 1824 **YELLOWWOOD** *Fabaceae Cladrastus* (kla-DRAS-tis) from Greek κλάδος, *klados,* a young shoot or branch, & *thraustos*, fragile for the brittle shoots. A genus of 5-6 spp of deciduous trees with a relictual distribution of the southeast United States with 4 spp in the mountains of Japan & China. Legume flat & thin, short stiped, 5 or 6-seeded. *C platycarpa* JAPANESE YELLOWWOOD & *C sinensis* CHINESE YELLOWWOOD are rarely cultivated in the US.

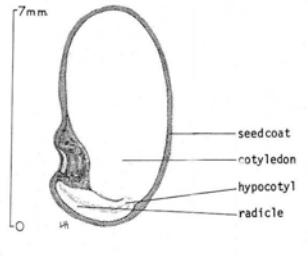



Photo & drawing courtesy of USDA Forest Service USDA-NRCS PLANTS Database

Cladrastis kentukea (Dumont de Courset) Rudd Formerly *C lutea* (Michaux f) K. Koch *IL, IN YELLOW WOOD, aka AMERICAN YELLOWWOOD, KENTUCKY GELBHOLZ, KENTUCKY YELLOWWOOD, *VIRGILIER A BOIS JAUNE*, YELLOW ASH, YELLOW LOCUST, YELLOWWOOD TREE, (*luteus -a -um* (LOO-tee-us) yellow, a distinct yellow, a full yellow; pale yellow, for the yellow wood.) The common name is a reference to the yellow heartwood.

un-copyrighted draught

Habitat: Hills in rich soil (w73). Mesic woods, ravines, river valleys, & limestone slopes. "Rare & local in the wild in rich rocky coves, limestone cliffs, rich hardwood forests" (Sibley). distribution/range: Alexander & Gallatin counties in southern Illinois. Rare throughout its range. Native to the southern Appalachians, Ozarks & limestone regions in between.
Culture: ①"Propagate by seed or root cuttings. Take cuttings in December & hold in nearly dry sand until transplanting to well-drained, fertile soil in mid-spring. Seed Treatment: Like all legume seeds, these need scarification. After scarification, stratification may or may not be necessary." (lbj)

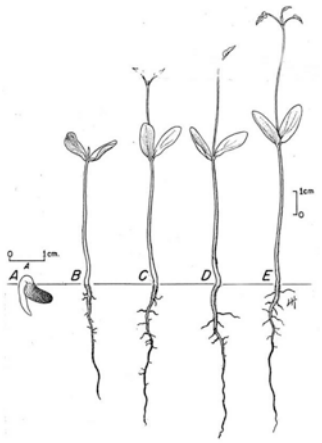
cultivation: Rich, well drained soils, partial shade. Deep rooted & drought resistant. Deep roots make transplanting difficult. pH 6.8-7.2. Commonly cultivated, hardy to zone 4 (4-8).

Slow growing in its early years. Low maintenance & nearly pest free. Corrective pruning may be needed, but do not prune in spring or immediately after transplanting. Winter & spring pruning cuts weep considerable. The deep roots allow shrub & perennial underplantings. Open grown specimens have a vase-like outline.
Description: Native, deciduous, fine textured, medium, tree, 30-50(-73)' tall, rarely to 50', with a broad, rounded crown 40-50' spread; bark thin, smooth, silvery-gray (pale gray, greenish), beech-like, often multi-trunked or low branched; branches graceful pendulous; twigs stout, angular, zigzag, thick- jointed, buds small, hairy, naked, covered by leafstalks, winter twigs irregular, tapered, with seed pods persisting in pendant clusters at twig tips; ash-like compound leaves, 10", with 5-11 alternate leaflets, each 3.0", leaves pale green or slightly bluish; good fall color yellow to gold (delicate orange or yellow); inflorescence terminal, pendant panicles, 10-15" long, of creamy white, wisteria-like flower clusters in early summer after the leaves, followed by panicles of flat, brown seed pods, legumes flat, thin, 2.5-4.0', 5-6-seeded, persisting through the winter.
Comments: status: Endangered in Illinois. Threatened in Indiana. phenology: Blooms (April-) May. Fruits mature September to October. Landscaping, shade tree, & flowering specimen; small shade tree for residential lawns, especially small lots, & may be planted near patios & terraces. Flowers showy & intensely fragrant. Trees may not flower until 8-10 years old, with good displays 2-3 times per decade.

The wood fluoresces pale yellow-light blue yellow under ultraviolet lights (Hoadley 1986).
Associates: The bark resembles that of *Fagus*, but unlike *Fagus, Cladrastis* bark may have lichens & mosses.

ethnobotany: Wood contains a yellow dye that colors the heartwood yellow. Native Americans used the wood for lumber & carving.
VHFS: Long known as *C lutea* (Michx f) K Koch. [*Cladrastis lutea* (Michx f) K Koch, *C kentukea* (Dumont de Courset) Rudd, *C tinctoria* Raf, *Sophora kentukea* Dum Cours] Some cultivars have pink flowers.





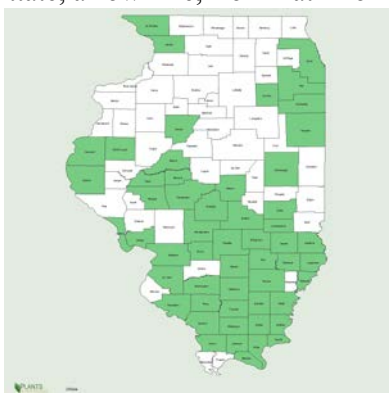
Cladrastis lutea

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Pod & seed photos Tracey Slotta - USDA-NRCS PLANTS Database - Not copyrighted image. Line drawing courtesy of USDA Forest Service USDA-NRCS PLANTS Database. Illinois map courtesy plants.usda.gov.

CORONILLA Linnaeus **CROWN VETCH, SCORPION SENNA** See S*ecurigera* DC *Coronilla* (ko-ro-NIL-la) 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. Loment somewhat terete, jointed; seeds mostly cylindrical.

CROTALARIA Linnaeus 1753 **RATTLEBOX** *Fabaceae Crotalaria* New Latin, from Latin *crotalum,* from Greek κρόταλον, *krotalon*, a rattle, a bell, castanet, used to accompany wanton dances, & New Latin *-aria*; from the rattling of the ripe seeds in the horny pod when shaken. A very large genus of about 600 spp, of mainly tropical annual & perennial herbs with chiefly simple leaves & showy yellow flowers in racemes. Nearly cosmopolitan in tropical & temperate regions, most diversity in Africa. Shrubs or herbs, yellow flowers; pod inflated; leaves simple or palmate; legume pedicellate, turgid.

Crotalaria sagittalis Linnaeus *WI RATTLE BOX, aka ARROW CROTOLARIA, ARROWHEAD RATTLE-BOX, COMMON RATTLEBOX, RATTLEBOX, WEEDY RATTLE-BOX, (*sagittalis -is -e* sagittate, arrow-like, from Latin for like an arrowhead.) upl



Habitat: Dry disturbed sandy soil. distribution/range: The most widespread North American sp. Known from but not mapped from Bureau & Rock Island counties. Sp was known from north of Normandy on the CNWRR, but the site may have been destroyed by recent construction. Also known from the John Deere facility at Silvis, Rock Island Co, Illinois.

Culture: ①No pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) No treatment, inoculate? 65,783 (gnam09); 72,000 (pm02, jfn04 & ew11) seeds per pound.

cultivation: Space plants 0.75-1.0'. Full sun, dry soil.

bottom line: Limited test data indicates plant dormant or spring. The seed does have a modest percentage hard seed that will benefit from dormant seeding. Scarify & inoculate for spring planting. Dormant seed with inoculated, unstratified seed. Germ 42.8, 42.8, na, sd 6.8, r36-49.5 (13.5)%. Hard 19.3, 19.3, na, sd 0.8, r18.5-20 (1.5)%. Test 26 days.**

Description: Erect, herbaceous, annual, native forb, 0.5'-1.5' tall, hairy; roots; stems; leaves hairy, almost stalkless, undivided, linear to lance-shaped; inflorescence a raceme with 2-4 short-stalked flowers; flowers yellow, 5-merous, 0.13-0.50" long; fruit legume (pod) oblong, inflated, & mostly stalkless; seeds few, rattling in the turgid pod; N. key features: ①Plant hairy; leaves undivided. ②Annual, stip. opposite, acuminate, decurrent, corolla shorter than the calyx (w73).

Comments: status: Special Concern in Wisconsin. phenology: Blooms June - September. "Its most remarkable

feature is the opposite, united, decurrent stipules, so situated that each pair appears inversely sagittate" (w73).
Associates: This genus has been shown to reduce populations of parasitic soil nematode populations.
VHFS: [*Crotalaria fruticosa* Mill, *C sagittalis* L var *blumeriana* Senn, *C sagittalis* L var *fruticosa* (Mill) Fawc & Rendle, *C sagittalis* L var *oblonga* Michx]

Crotalaria sagittalis
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov.

DALEA Lucanus 1758 **PRAIRIE CLOVER, TASSELS, DALEA** *Fabaceae Dalea* Da'lea (DAY-lee-a) named after Samuel *Dale* (1659-1739), an English physician, botanist, botanical collector, & gardener; authored several botanical works & a treatise on medicinal plants. He was an associate of several major botanical figures in England. Thomas Dale, English botanist, in one source. In the broad sense, a genus of about 160 spp primarily of the dry areas of temperate & tropical America. Weakley (2007) notes that the inclusion of *Petalostemon* in *Dalea* is controversial & the recognition of *Petalostemon* may be warranted.

Dalea aurea Nuttall ex Pursh GOLDEN PRAIRIE CLOVER 92,800 (pm2002) seeds per pound.

Dalea aurea
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society.

Dalea alopecuroides Willd
Prairies & bottoms, Ill, Mo, Car (w73).

"This peculiarity as of aggregation of individuals of one or more species, to something like an exclusive monopoly of certain locations, obtains even in regard to those plants which are the rarest and the least frequently met with; for whenever one specimen was found (page 189) there generally occurred many more in the same immediate neighborhood. The *Dalea alopecuroides,* (Willd.), which I met with but once, was found in that locality in the greatest abundance." (Short 1845)

[*D Linnaei* Mx, *Petalostemon* Ph]

Dalea enneandra Nuttall NINE-ANTHER PRAIRIE-CLOVER, aka SAIL-POD DALEA, (*enneandrus -a -um* with nine stamens.)
VHFS: [*Parosela enneandra* (Nutt) Britton]

Dalea enneandra
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society.

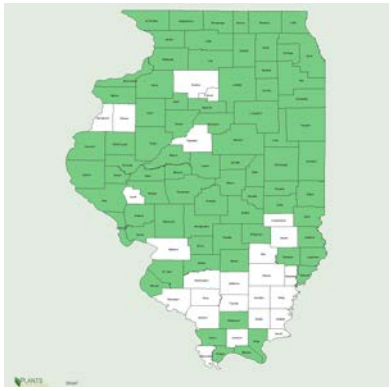
DESMODIUM Desvaux 1813 **BEGGARS LICE, TICK CLOVER, TICK TREFOIL, STICK TIGHTS, BUSH TREFOIL** *Fabaceae Desmodium* long branch or chain, New Latin, probably irregular from Greek δεσμὸς, *desmos,* band, bond, chain from δεῖν, *dein,* to bind, bond, & New Latin *–ium,* as in reference to the slightly connected joints of the loment. Alternately from Greek δεσμὸς, *desmos*, a chain, for the jointed stamen (?by some authors), but one would think it is for the resemblance of segmented fruit to a chain. Large genus (76+ spp in USA) of coarse perennial (some annuals), chiefly tropical herbs having stipulate pinnate leaves, racemose flowers, & indehiscent fruits (loments) that separate into one-seeded segments with small hooked hairs that stick to clothing or animals. Nearly cosmopolitan but absent in Europe. Legume (loment) compressed, jointed, constricted most on the lower (dorsal) suture, the joints 1-seeded, separable, mostly aculeate & adhesive. Leaves 3-parted; flowers in panicles or racemes, pinkish flowers; pods (loments) compressed, triangular, sticky, 1-seeded sections. Some recent authors place some of our spp in *Hylodesmum* H Ohashi & RR Mill. A walk through a ripe *Desmodium* patch may just ruin that new flannel shirt. Formerly *Meibomia* Heist. Wood (1873) lists *Hedysarum* L as a synonym.

Desmodium propagation "Scarify then inoculate, or fall sow. Light cover. Good germination." (mfd 1993) Easy by scarified, inoculated & stratified seed.

Hull, scarify, & 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." (pnnd). Attracts butterflies, small mammals, & quail.

Desmodium various species: "Other common plants, which presented themselves at different places on our route through the prairies" (Short 1845).

Desmodium canadense (Linnaeus) Augustin de Candolle SHOWY TICK TREFOIL, aka BEGGARS' LICE, CANADA TICK CLOVER, CANADIAN TICK-TREFOIL, HOARY TICK TREFOIL, SHOWY TREFOIL, STICK TIGHTS, (*canadensis -is -e* of Canada or ne USA. The epithet was formerly capitalized.) fac-
Habitat: Dry mesic to wet-mesic prairies, but commonly mesic prairie. Moist to wet soils, thickets & streambanks. "Common, mostly in prairie situations, along railroads & in the Sugar River sand area." (ewf55) Rather common in woods (w73). In New England, "Thickets, fields, open woods, meadows, riverbanks, sandy, open soil, roadsides, railroads, & waste places" (anef).
distribution/range: Known but not mapped from Bureau County.
Culture: ①Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial



inoculum. (pm09) ②Seeds need scarification, no further pre-treatment needed. Sowing outdoors in the spring is the easiest method. Legume, requires appropriate rhizobial inoculum (he99). ③No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germ (tchn). 72,000 (jfn04, sh94); 80,000 (ecs, ew11); 81,964 (gna04); 88,000 (pm02, aes12); 90,276 (gna04); 119,223 (gnh02); 120,000 (usda); 142,297 (gna06); 149,210 (gnh11) seeds per pound. 3-4 lbs pls per acre for a wildlife planting (usda).

"*Desmodium canadense* Mesic prairie. Blooms July-August; PURPLE. Harvest early October. 3 1/2'; easy by methods #1 & #2. Successful by SEEDLING TRANSPLANT & SPRING BROADCAST; Inoculate, legume. Flowers 2nd year. Fruits stick to clothes." (rs ma)

cultivation: Space plants 1.5-2.0'. Full sun to partial shade, medium soils. Clay soil tolerant. Drought tolerant.

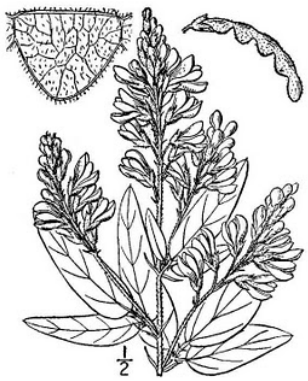
bottom line: Genesis seed tests indicate over 50% of lots have a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but early spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed. Flipflop species. Germ 54.5, 62.5, 38, sd 25.4, 8.0-94 (86)%. Hard 29.7, 17.5, 2.0, sd 29.9, r0.0-91 (91)%. Test 22, 20, 19, r9-43 days. (#22)**

Description: Erect, herbaceous, perennial, native forb, 3'-6' tall; root minimum depth; stems branching toward the top; leaves 3-parted, on stalks up to 0.75" long & up to half as long as the end leaflet; inflorescence a branched, dense panicle of several, spike-like clusters (racemes) with obvious small, leaf-like bracts beneath, flowers rose-purple to pink, aging to blue (blue/violet, red/pink), 5-merous, 0.33-0.50" long, stalked; fruit is flat pod, slightly curving, divided into triangular segments that are covered with clinging, hooked hairs; N 2n = 22. key features: ①Inflorescence 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. ②Leaflets oblong-lanceolate, nearly smooth, stip. filiform (w73).

Comments: status: phenology: Blooms 7,8,9. C3. In northern Illinois, collect seeds in September. Collect seeds in se Wisconsin in September - October (he99). Attractive cut flowers, landscaping. Open-pollinated. Surprisingly drought tolerant, we have many thousands of volunteer plants on dry, sterile sands. May be aggressive from seed, fruits are stick tights. Seed sources nursery production genetic source remnant prairie Shaw Station, Lee Co, & mesic railroad remnant west of Sheffield, Concord Twp, Bureau Co.

Associates: Butterfly larval host, GRAY HAIRSTREAK & EASTERN-TAILED BLUE BUTTERFLY. Provides food & cover for quail, pheasant, turkey, ground birds, songbirds, & deer. Seeds are an important food source for upland gamebirds & songbirds. Foliage adversely impacted by *Popillia japonica,* Jap beetles, in 2008, 2010, & 2011. In 2011, the plants came back later in the summer & somewhat reflowered & set seed. Host to N2-fixing rhizobial bacteria.

VHFS: In Britton & Brown (1913), this sp is *Meibomia canadensis.* In Wood 1873, this is *D Canadense* DC. [*Hedysarum canadense* L, *Meibomia canadensis* (Linnaeus) Kuntze] An improved selection from the USDA is available.






Desmodium canadense

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov.

Desmodium canescens (Linnaeus) Augustin de Candolle *WI HOARY TICK TREFOIL, aka HOARY TICK CLOVER, (*canescens* gray (or white) & somewhat hairy, gray-pubescent, generally hoary or whitish, from New Latin *canescens* gray, grayed, or hoary, from *canesco*, I become white or gray; generally referring to the tiny whitish hairs.)

Habitat: Fields & woods. In New England, "dry, sandy woods, fields, thickets, roadsides and waste areas" (anef).

distribution/range:

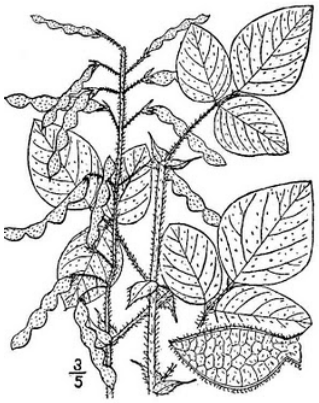
Culture: Sp is no longer in the native seed trade. 44,800 (pm02 & jfn04) seeds per pound.

Description: Erect, herbaceous, perennial, native forb, 3.0'-6.0' tall, very hairy, often with many branches; from a long taproot; stems; leaves 3-parted, leaf stalk much longer than the end leaflet; inflorescence a 3"-6" long panicle of several spike-like racemes; flowers pink to greenish, 5-merous, 0.33" long, stalked; fruit flat, mostly straight pod divided into about 4 segments & covered with hooked hairs; N. key features: ①Very hairy plant; mostly straight pod; leaf stalk much longer than the end leaflet. ②"Sp has a much branched stem." (Ilpin). ③Stems striate, scabrous; leaflets ovate, rather obtuse, soft-villous beneath (w73).

Comments: status: Special Concern in Wisconsin. phenology: Blooms 7-9. C3. In time, this sp "self-sows" with the help of birds & small mammals, often several hundred feet from the mother plant. Our material came from Prairie Moon. It is thriving in xeric sands, surviving Jap beetle assaults, with only fire & benign neglect.

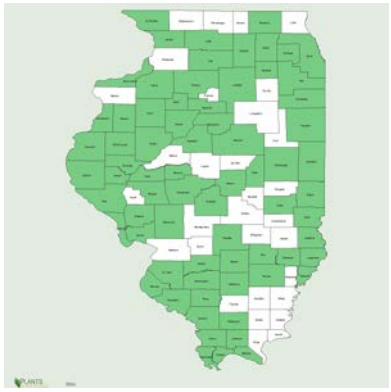
"Less common than the preceding (*D canadense*), in the same locations. The flowers are pale, the plant is pale, the leaves are petioled, the stipules conspicuous, & the loment stipitate." (ewf55) "An upright, branching plant, with very long panicles of flowers, greenish externally, purple within" (w73).

Associates: Adversely impacted by *Popillia japonica*, even more so than *D canadense.* Plants reblooming August 2011 after Jap beetles died out for the year or were killed by the drought.
VHFS: *D canescens* DC with sub *D Aikinianum* Beck in w73.

Desmodium canescens with leaves damaged by Japanese beetles
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photos Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov.

Desmodium cuspidatum (Muhlenburg ex Willdenow) Augustin de Candolle ex Loudon BRACTED TICK-TREFOIL, aka LARGE-BRACTED TICK-TREFOIL, (*cuspidatus -a -um* with a cusp or sharp stiff, or rigid point.)
Habitat: Dry woods & thickets. In New England, rocky, rich, open woods (anef). distribution/range:

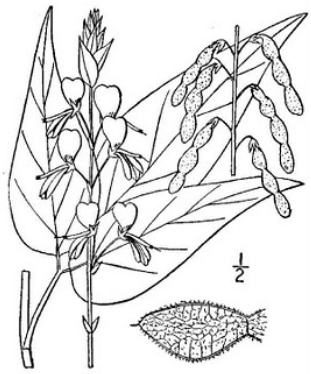


Culture: ①Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm09) 78,400 (aes12) seeds per pound.
Description: Erect, herbaceous, perennial, native forb, to 6.5' tall; root minimum depth; stems stout, leafy; leaves 3-parted, leaflets bright green on top & paler below; inflorescence a spike-like cluster with few or no branches; flowers pink, 5-merous, 0.25-5.0" long, stalked; fruit is a flat pod covered with hooked hairs & divided into triangular segments; N 2n = ?. key features: ①Stout, leafy stems; leaflets bright green on top & paler below. ②"Leaflets are sharply long pointed; stems, leaflets, & bracts are glabrous or nearly so" (Ilpin). ③Smooth, leaflets oblong-oval, or ovate
Comments: status: phenology: Blooms July - August. C3.
Associates:
VHFS: Variety *cuspidatum* [*Desmodium bracteosum* (Michx) DC, *D bracteosum* (Michx) DC var *bracteosum, D grandiflorum* DC, *Hedysarum cuspidata* Muhl ex Willd, *H grandiflorum* Walter, non Pall, *Meibomia bracteosa* Michx) Kuntze, *M cuspidata* (Muhl ex Willd) Schindl., *M grandiflora* (DC) Kuntze]

un-copyrighted draught

Variety *longifolium* (Torr & A Gray) BG Schub. [*Desmodium bracteosum* (Michx) DC var *longifolium* (Torr & Gray) BL Rob, *D canadense* (L) DC var *longifolium* Torr & Gray, *D longifolium* (Torr & Gray) Smyth, *Meibomia longifolia* (Torr & Gray) Vail]

Wood (1873) has this as *D cuspidatum* Torr & Gr, synonym *D bracteosum* DC.



Desmodium cuspidatum

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov.

Desmodium dillenii Darl. PERPLEXED TICK-TREFOIL, AKA DILLENIUS' TICKTREFOIL (*dillenii* honoring for Johann Jacob Dillen (Latinized as *Dillenius*), 18th century German botanist, botanical engraver & illustrator, physician, & professor at Oxford. Linnaeus honored him with the tropical tree genus *Dillenia* & *Dilleniaceae*.) "Not common on roadsides & in the border of woods. The stem is glabrous, the leaves are petioled, the stipules are caducous, & the loment is stipitate." (ewf55) Stipules subulate, joints of loment 3, rhomboidal [*D Marilandicum* DC]

Synonym of *D paniculatum, D glabellum,* or *D perplexum*.

D paniculatum var *dillenii* (Darlington) Isely is *Desmodium glabellum* (Michx) AP de Candolle.

Meibomia dillenii (Darlington) Kuntze is *Desmodium perplexum* Schubert.

Desmodium glabellum (Michaux) de Candolle *CT SMOOTH TICKTREFOIL, aka DILLENIUS' TICKTREFOIL, PANICKLE TICKTREFOIL, PERPLEXED TICKTREFOIL, TALL TICK CLOVER,

Habitat: In Illinois, savannas, rocky upland forests, edges of wooded areas, thickets, and limestone glades" (Hilty). In Michigan, "Dry, sandy, open forests, dry hillsides & banks, borders of dry forests" (rvw11). In New England "Dry, sandy woods, clearings, roadsides" (anef). distribution/range:

Culture: propagation:

Good seed to soil contact is important for germination and establishment. The seedbed should be firm enough to allow the seed to be planted 1/8" to ¼ deep. Cultipacker seeders and band seeders followed by press wheels or a cultipacker help ensure shallow seed placement and good seed-to-soil contact. Inoculating seeds with *Rhizobium* before planting is recommended." (usda)

(Growth rate . Seedling vigor . Vegetative spread rate . Seed spread rate .)

"2 to 4 oz. pure live seed per acre for wildlife planting or 0.5 to 10% of a mix for prairie restoration" (usda).

asexual propagation:

cultivation: Partial sun & mesic to dry soils. (Tolerant of textured soils. Anaerobic tolerance. CaCO3 tolerance . Drought tolerant. Fertility requirement . Fire tolerance resprout. Salinity tolerance . Shade tolerant. pH .)

bottom line:

greenhouse & garden:

Description: plant Flowers pink to purple, becoming blue. N 2n = 22. key features: "Presumably, *Desmodium perplexum* and *Desmodium glabellum* can be distinguished as follows: 1) the former species has a faint reticulated network of veins on the lower surface of the leaflets, while the latter has a strong reticulated network of veins, and 2) the former species has hairs on the stems and leaves that are straight or somewhat curved, while the latter has hooked hairs. Other distinguishing features for Perplexing Tick Trefoil include inconspicuous stipules that are very narrow and deciduous (i.e., they wither away quickly), and petioles of the compound leaves that are at least

½" in length." http://www.illinoiswildflowers.info/savanna/plants/perplexing_trefoil.htm
Comments: status: Special Concern in Connecticut. phenology: Blooms
Associates: Attracts bees. Japanese beetles feed on leaves & flowers. Seed eaten by upland game birds & songbirds. herbage eaten by deer.

ethnobotany:

VHFS: Formerly included in a broadly defined *D. paniculatum.* Basionym *Hedysarum glabellum* Michaux 1803. [*Desmodium dillenii* Darl. pro parte, *Desmodium paniculatum* var. *dillenii* (Darl.) Isely, *Hedysarum paniculatum* Linnaeus, var. obtusum Desvaux, *Meibomia glabella* (Michx.) Kuntze, *Meibomia paniculata* (Linnaeus) Kuntze, var. *obtusa* (Desvaux) Schindler]

Release Brochure for Alcona Germplasm Dillenius' Tick Trefoil *Desmodium glabellum.* USDA-Natural Resources Conservation Service, Rose Lake Plant Materials Center, East Lansing, MI 48823 Published June 2006, Revised January 2012.

Release Brochure for Marion Germplasm Dillenius' tick-trefoil (*Desmodium glabellum*). USDA-Natural Resources Conservation Service, Rose Lake Plant Materials Center, East Lansing, MI 48823. Published June 2006, Revised April 2014.

Desmodium glutinosum (Muhl ex Willd) AW Wood See *Hylodesmum glutinosum* (Muhlenberg ex Willdenow)

Desmodium illinoense A Gray *OH ILLINOIS TICK TREFOIL, aka ILLINOIS TICKCLOVER, PRAIRIE TICKTREFOIL (*illinoensis -is -e* of, from, or pertaining to Illinois.) upl

Habitat: Sand prairies & dry roadsides. Dry to mesic prairies.
distribution/range: Known but not mapped from Bureau Co.
Culture: ①Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. Legume, requires appropriate rhizobial inoculum (he99). ③No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ④Slow germinator - up to a year or more. Store seeds in layers of moist sand in the shade. Check seeds regularly in the spring, and sow them all as soon as radicles appear. (tchn) May aggressively self sow on sand. 38,400 (aes12); 56,396 (gnh11); 62,311 (gnh13); 67,696; 68,800 (pm02, jfn04, ew11); 70,689 (gna06); 80,913 (gnh13) seeds per pound.

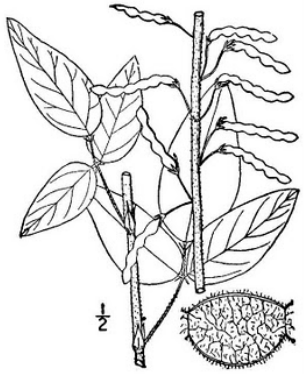
"*Desmodium illinoense* Dry prairies. Blooms July; PALE PINKISH PURPLE. Harvest September. 4 1/2'; easy by methods #1 & #2. Successful by SEEDLING TRANSPLANT & SPRING BROADCAST. Too coarse except by method 2, much grass. Legume, inoculate. Flowers 2nd year. Fruits stick to clothes." (rs ma)

cultivation: Space plants 1.5-2.5'. Full sun to partial shade dry soils. Dry to moderate moisture.

bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but early spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed. A non-hard lot is known. Flipflop species (of late?). Germ 55, 57, 21, sd 29.1, r15-99 (84)%. Dorm 40.5, 35, na, sd 28.6, r0.0-84 (84)%. Test 22, 21, 19, r16-33 days. (#12).**

Description: Erect, herbaceous, perennial, native forb; root; stems up to 3.0-4.0(-6.0)' tall; leaves 3-parted, lance-like, both sides rough with hooked hairs; leaf stalk much longer than the stalk of the end leaflet; inflorescence a sparsely-flowered, long raceme, with no to few branches; flowers single terminal inflorescence of white to blue or pink flowers, 5-merous, 0.33" long, stalks about 0.50" long; fruit flat, mostly straight pod covered with clinging, hooked hairs & divided into 2-5 rounded segments; N. key features: Sparsely flowered long raceme; pod divided into rounded segments; leaflets rough hairy top & bottom; leaf stalk much longer than the stalk of the end leaflet. "Sp has slender stem with few branches; lower leaf surface is prominently reticulate." (Ilpin)
Comments: status: Presumed Extirpated in Ohio. phenology: Blooms July - August. C3. In northern Illinois, collect seeds in late August through October. Collect seeds in se Wisconsin in October (he99). Landscaping aggressive, seeds are stick tights. Leaves have small hooked hairs & will stick to clothing like natural Velcro. Seed source Squaw Grove Twp, DeKalb Co.

"Common along roads & railroads, a slender plant with unbranched inflorescence. Leaves petioled, stem pubescent, pods stipitate, the joints oval or orbicular." (ewf55)
Associates: Attracts upland game birds & songbirds. Moderately impacted by *Popillia japonica*, Jap beetles, but not as badly as *D canadense.*
VHFS: [*Meibomia illinoensis* (Gray) Kuntze]



Desmodium illinoiense self sown on sterile blow sand
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov.

Desmodium nudiflorum (Linnaeus) Augustin de Candolle See *Hylodesmum nudiflorum* (Linnaeus) H Ohashi & RR Mill.
key features: ①Leaflets roundish, ovate, bluntly acuminate, scape radical (w73).
"It is remarkably distinguished by having its leaves & fls on separate stalks often distant from each other" (w73).
Desmodium nudiflorum DC.

Desmodium paniculatum (Linnaeus) Augustin de Candolle var **dillenii** (Darlington) Isely PANICLED TICK TREFOIL, aka DILLENIUS' TICK-TREFOIL, NARROW-LEAF TICKTREFOIL, PANICLEDLEAF TICKTREFOIL, PANICLED TICKCLOVER, PERPLEXED TICK-TREFOIL (*paniculatus -a -um* (pa-nik-ew-LAH-tus) with flowers in panicles; *dillenii* honoring for Johann Jacob Dillen (Latinized as *Dillenius*), 18th century German botanist, botanical engraver & illustrator, physician, & professor at Oxford. Linnaeus honored him with the tropical tree genus *Dillenia* & *Dilleniaceae*.)

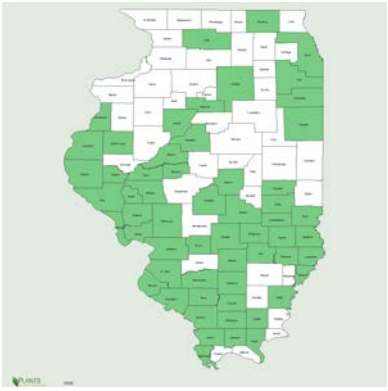
Habitat: Moist to dry savannas, mesic woods. In Illinois, "thinly wooded bluffs, rocky open woodlands, sandy open woodlands, sandy savannas and typical savannas, woodland edges, thickets, rocky glades, & partially shaded roadside embankments" (Hilty). In New England "dry, open, often rocky or sandy woods, dry, woodland borders, thickets, clearings, fields, roadsides" (anef). distribution/range: Occasional in Illinois except for the nw cos.
Culture: ①Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) 78,400 (ew11) seeds per pound.
cultivation: Space plants 1.25-1.5'. Full sun to woodland (partial sun), mesic to dry soils, sandy or rocky soils.
Description: Erect, herbaceous, perennial, native forb, 2.0-4.0' tall; flowers pink (purple), 5-merous; fruit a flat pod, divided into triangular segments, 3-5 jointed, covered with hooked hairs. N 2n = 22. key features: ①Nearly glabrous, leaflets oblong-lanceolate (w73). ② "1) the narrow leaflets are 3-6 times longer than they are across, 2) the petioles of the trifoliate leaves are fairly long (up to 2"), 3) the deciduous stipules of the trifoliate leaves are small and insignificant, and 4) the leaflets are rather long (up to 3½")" (Hilty).
Comments: Blooms 7-9. C3.
Associates: Pollinated by *Bombus spp*, bumblebees, *Megachile spp*, leaf-cutting bees, & *Melissodes spp*, digger bees.

VHFS: [*Desmodium dillenii* Darl, *D glabellum* (Michx) DC, pro parte, *D perplexum* BG Schub, *Meibomia dillenii* (Darl) Kuntze]

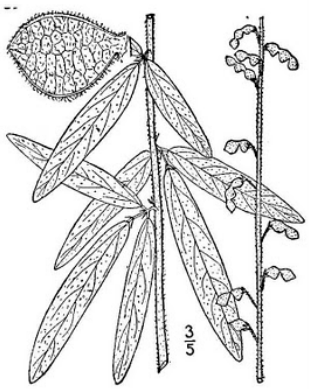
Desmodium paniculatum

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photos Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image. Illinois map courtesy plants.usda.gov.

Desmodium sessilifolium (Torrey) Torrey & A Gray *CT, MD, NJ, OH, PA, RI SESSILE-LEAF TICK TREFOIL, aka SESSILE TICKCLOVER, SESSILE-LEAF TICKCLOVER, (*sessilifolius -a -um* sessile-leaved.) There are many references to this plant as *D 'sessifolium'*.



Habitat: Dry to dry mesic prairies & savannas & dry woodlands. Woods near the mushroom farm, Depue. distribution/range: Northern Illinois is at the north limit of sp range. Known from but not mapped from Selby Twp, Bureau Co, woods edge, near the well at Mushroom Factory.
Culture: ①Seeds need scarification. No additional pre-treatment necessary other than cold, dry stratification. Legume, requires appropriate rhizobial inoculum. (pm09) ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. Legume, requires appropriate rhizobial inoculum (he99). ③No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ④Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germ (tchn). 80,000 (pm02); 81,600 (ew11); 82,000 (jfn04), 102,160 (gnhj13) seeds per pound.
cultivation: Space plants 1.0-1.5'. Full sun to partial shade, dry soils.
bottom line: Genesis seed tests indicate this seed typically has a high percentage of hard seed & may strongly benefit or require dormant seeding to establish a good stand, but early spring planting inoculated scarified seed is necessary for rhizobia establishment. Dormant seed with inoculated, unscarified seed. Germ 37.5, 37.5, na, sd 15.5, r22-53 (31)%. Hard 58, 58, na, sd 27, r42-74 (32)%. Test 15, 15, na, r11-19 days.**
Description: Erect, herbaceous, perennial, native forb; stems 2.0-4.0' tall; flowers pink - lavender. key features: ①"Leaves are sessile or nearly so" (Ilpin). ②Leaves sessile, leaflets linear or linear-oblong, scabrous above, softly tomentose beneath, stip. subulate (w73).
Comments: status: Endangered in New Jersey, Ohio, & Pennsylvania. Endangered, extirpated in Maryland. Special Concern in Connecticut. Threatened in Rhode Island. phenology: Blooms 7-9. C3. Collect seeds in se Wisconsin in October (he99). Genetic source from Hollowayville, Selby Twp, Bureau Co. This sp was offered by Windrift Prairie Nursery.
Associates: Seeds provide food for birds.
VHFS: [*Meibomia sessifolia* (Torrey) Kuntze (typo), or *Meibomia sessilifolia* (Torr) Kuntze] Woods (1873) as *D sessilifolium* Torr & Gr.


Desmodium sessifolium

eLine drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy plants.usda.gov.

End Bean Family Section One.

Endnotes & abbreviations. The following math functions violate Abbey's 1st Law, which see.

++ The listed numbers are seed count mean, seed count median, seed count mode, seed count standard deviation, seed count max, seed count min, seed count range.

** The listed numbers are Germ mean, germ median, germ mode, germ standard deviation, germ range (range); Dorm mean, dorm median, dorm mode, dorm standard deviation, dorm range (range); Test mean, test mode, test range. (#germ test : tz etc)

Reference abbreviations May 04 2014

CEPPC	California Exotic Pest Plant Council
CIPC	California Invasive Plant Council
SEPPC	Southeast Exotic Pest Plant Council
SWSS	Southern Weed Science Society
RBG Kew	RBG Kew, Wakehurst Place
aes10	(AES 2010)
afvp	(Atlas of Florida Vascular Plants)
anef	(Angelo & Boufford: Atlas of New England flora)
apl	(Applewood)
asfg	(Audubon Society Field Guide)
wade	(Alan Wade, nd, various years, 95, &c)
bsh	(Baker Seed Herbarium, California)
bb02	(Baskin & Baskin 2002, 2001, &c.)
nlb05	Britton 1905
cb03	(CC Baskin 2003, 2001, &c.)
crfg	California Rare Fruit Growers
csvd	(Currah, Smreciu, & Van Dyk 1983)
tchn	tomclothier.hort.net (-4ºC 24ºF stratification being corrected)
cu00	(or cu02, &c, Cullina 2000, 2002, 2008)
nd91	(Norm Deno, 1991, 1993)
den28	(Densmore 1928)
do63	(Dobbs 1963)
mfd93	(Mary Fisher Dunham 1993)
dh87	(Dirr & Heusser 1987)
drwfp	(Directory of Resources on Wildflower Propagation)
ecs	(Ernst Conservation Seeds catalog)
ew12	(Everwilde 2012) also ew11
ewf55	(Egbert W Fell 1955)
ewf59	(Egbert W Fell 1959)

fh	(Robert W Freckmann Herbarium)
fna	(Flora of North America project)
foc	(Flora of China online)
fop	(Flora of Pakistan online)
gni	(Genesis Nursery, Inc)
gc63	(Gleason & Cronquist 1963, 1991)
gran	(Granite Seeds)
he99	(Heon et al 1999)
hk83	(Hartman & Kester 1983)
hpi	(Hill Prairies of Illinois (Hilty website)
Ilpin	(Illinois Plant Information network)
jf55	(Jones & Fuller 1955)
jlh	(JL Hudson, Seedsman, (if the phone doesn't ring its me))
kpw	(Kansas Prairie Wildflowers)
krr	(Kenneth R Robertson)
lbj	(Lady Bird Johnson Wildflower Center Native Plant Information Network)
m14	(Mohlenbrock 2014) also m86, m99, m02, m05, m06, &c
mbg	(Missouri Botanic Garden)
msue	(Michigan State University Extension)
nae	Native American Ethnobotany (Moerman, University of Michigan Dearborn)
now36	(Nowosad et al 1936)
nyfa	(New York Flora Atlas)
orghp	(Ontario Rock Garden Hardy Plant Society)
ppc	(Philips Petroleum Company)
pots	(Plants of the Southwest 2000)
pm09	(Prairie Moon 2009) also pm02, pm11, &c
pnnd	(Prairie Nursery no date)
pph	(Prairie Propagation Handbook)
ppi	(Prairie Plants of Illinois)
psdg	(Plants of South Dakota Grasslands)
pug13	(plants.usda.gov accessed 2013, 2014)
oed	Oxford English Dictionary online
rain	(Ranier Seeds)
rrn97	(Reeseville Ridge Nursery 1997)
rvw11	(Reznicek et al 2011)
rs ma	(Ray Schulenburg Morton Arboretum)
rhs	Royal Horticultural Society
sh94	(Shirley Shirley 1994) & don't call me Shirley
sk08	(Stuppy & Kesseler 2008)
sm23	(Smith 1923) also sm32, sm33, sm28, &c.
sw79	(Swink & Wilhelm 1979)
sw94	(Swink & Wilhelm 1994)
tlp	(Time Life Perennials)
tlw	(Time Life Wildflowers)
tpg	The Prairie Garden
uconn	(UConn Plant Database)
us97	(USDA 1997)
w12b	(Weakley Nov 2012) also w07-12
wfatp	(Vance & Vance 1979)
wfn	(Wildflowers of Nebraska)
wfnp	Wildflowers northern prairies)
ws92	(Wilhelm & Swink 1992)
w73	(Alphonso Wood 1873)
ry64	(Richard Yarnell 1964)

yy92 (Young & Young 1992)
Reliquum etiam non scriptum est.