

The following information is condensed from 3 versions of a handout prepared by Ray Schulenberg of the Morton Arboretum. PDFs of the originals are available on request. Slight format changes have been made and abbreviations have been spelled out, but I have tried to keep the essence of the original handouts when changed from a typed spreadsheet type document to a word document.

NOTES ON THE PROPAGATION OF PRAIRIE PLANTS

17.Nov.67; revised 7.Feb.72 rfs

1st handout

The following methods were used for growing and establishing prairie plants at the Morton Arboretum, 1963-1967. In all cases plantings were made in weedy old farm land; the ground was plowed at least half a year previous to planting, was later disked, and finally was rototilled just before planting.

3rd handout, 7.Feb.72

The following methods were used in prairie restoration at the Morton Arboretum in the years 1963-1971. The rationale of the project was to build a self-maintaining community of locally native prairie plants in weedy old farm land. In all cases the ground was plowed at least half a year previous to prairie planting, and was disked up to the time of planting to reduce weed infestation. No information was available to the writer as to soil classification, pH, nutrient levels, etc.; therefore no attempt was made to improve the field soil by lime, fertilizers, etc. Likewise, no attempt was made to sterilize the field soil by heat or chemicals, and no chemical herbicides were used. Except for occasional use of a watering can when transplanting, there was no irrigating in the field.

Seed sources. With very few exceptions, prairie propagation at the Morton Arboretum was done by use of seed rather than by vegetative means. Again with negligible exceptions, the seed was collected locally from spontaneous populations, almost all within 50 miles of the Arboretum.

Collecting and cleaning seed. Our seed was collected by our own trained personnel or by trusted colleagues; this is no job for boy scouts. The seed of each species is collected when the fruits are mature and begin to shatter. It is dried in shade, without artificial heat or other aid, and is cleaned by use of screens, emery blocks, and other equipment as the plant material requires. We constructed a set of large, nesting, rectangular sieves for this use, each sieve with a different mesh size. Winnowing is regularly used to get rid of chaff and dust. However, if the seed is not to be sown with a drill, it need not be completely separated from other plant parts. The clean seed can be stored dry at room temperature, or preferably in a cooler place until time for cold damp storage.

1st handout

Method #1 SEEDLINGS GROWN IN GREENHOUSE

Processing the seed. Seed is collected as soon as mature, is cleaned by the use of sieves, and is stored dry. Before the first of February the seed is "stratified": by being mixed with at least an equal volume of damp beach sand and placed in a polyethylene bag, which is firmly tied shut and placed in a refrigerator kept between 32 and 38 degrees Fahrenheit.

Sowing the seed. About the first of April the seed is sown (along with the sand) in flats of sterilized soil; the flats are then set in a vat of water until surface of soil shows moisture, then set on greenhouse bench and covered with wrapping paper. Greenhouse temperatures are usually between 50 at night and 80 on the brightest days. When the seedlings emerge, paper is removed. Legume seeds are inoculated with Nitragin just before sowing.

Banding the seedlings. When seedlings have true leaves and strong enough roots, they are transferred, singly or in small tufts into wood veneer plant bands in other flats, again in sterile soil. When filled, these flats too are watered the first time by being set in a vat of water; later watering is by sprinkler nozzle.

Transplanting to the field. When the seedlings are well established in the bands, and when frost danger is past outside (usually around May 15), the plants are transplanted with a trowel, band and all, into freshly tilled soil in the field that is to become prairie, at a spacing of one band per square foot.

Achieving a mixture. Mixture or prairie plants can be achieved at any one or more of the above steps: when the seed is collected, stored, stratified, or sown --or when the seedlings are banded, or even when they are transplanted to the field. In any case it is wise to have at least one vigorous plant of a warm-season grass in each square foot of field; this is to give competition to weeds and to provide fuel for fire.

Weeding the planting. It is necessary to weed between these plants through the first growing season. This can be done by walking among the prairie plants (but not when the ground is muddy) and pulling individual weeds or cutting them out with a linoleum knife.

Use of fire. Regardless of the method used in establishing prairie, burning the dry plants as they stand in the field has proved to be extremely useful in fighting weeds. March 21st is about the best time, since a fire at this time does little harm to prairie plants but controls weeds effectively. Delaying the fire until this time conserves soil and water and provides wildlife habitat through the winter; this delay also lets many weeds start spring growth, becoming highly vulnerable to fire. Burning at a later date does more damage to prairie plants. Fire is dangerous and should be used only with great caution; burning should not be attempted on windy days. We have not used flame-throwers or additional fuel, but rather have let the prairie burn naturally after being ignited by a match.

Method #1 has these advantages: It requires very little seed; it gives prairie plants a headstart over weeds; it allows full control over location of each plant; it allows weed control by relatively untrained help. Its disadvantages are: a tremendous input of time, effort, facilities, and materials for raising the seedlings and transplanting them; also the resulting prairie will have an artificial look for years or decades.

Method #2 SEED SOWN IN FIELD IN SPRING

Broadcast seeding. Seeds are handled as with Method #1, but instead of being sown in flats in April, they are sown directly in their permanent home in the field in May. Before being sown, the various seeds (together with the sand in which they were stratified) are mixed together; if there are legumes the proper strains of Nitragin are added at this time.

Then this mass is mixed with at least twice its volume of dry Terralite; this operation makes possible a more uniform distribution. This mixture is then broadcast by hand evenly over the field. Then the surface of the soil is raked lightly and the entire area is rolled with a lawn roller. Rates of seed distribution are indefinite because of presence of chaff, differences between seeds of various species, etc. A suggested minimum rate is about 4 quarts of seed mixture (before Terralite) to 1000 square feet. This would be more than five bushels to an acre. At least half the seed by volume should be warm-season grasses.

Weeding the broadcast planting. We regularly weed a seeded field the first time by squatting or kneeling on a plank and pulling or cutting the weeds individually from among the prairie seedlings. By far the best tool we have found for this operation is a linoleum knife, kept sharp by frequent use of a file. Weeding this kind of a planting, where many kinds of prairie seedlings are intricately mingled with many kinds of weeds, requires a great deal of botanical knowledge, good eyesight, and strong character. The second weeding of the summer can be accomplished from a standing position, without a plank.

Method #2 has the advantages of producing a far more natural-looking prairie than Method #1, and of eliminating all the tedious and expensive operations of growing seedlings in flats and transplanting them. Its disadvantages are that it requires much more seed to cover a given area, and for the weeding operation requires workers who are careful and highly trained.

Method #3

Fall seeding with "seed hay." Late October is the usual time for this operation. Prairie seeds are collected rapidly and indiscriminately by stripping or clipping off entire inflorescences of whatever is ripe; the mixture is trampled in a large tub or on a dropcloth, and then scattered (stems, leaves, and all) over the freshly tilled ground. It is raked in lightly, and receives no further attention until spring.

Weeding. The same weeding procedure is used as with method #2, but with Method #3 the weed threat is much worse. Most prairie seeds do not germinate until May, but in the meantime many weeds seeds are germinating in fall and early spring, so that by may there is already serious competition. Therefore this method requires earlier, more labor and more frequent weeding.

Method #3, because of the mulching effect of the "hay", is useful on ground that is subject to severe erosion. It has the further advantages of being done in the fall (when time is not in such desperately short supply), and of requiring almost no handling of the seed (i.e. no cleaning, storing, or stratifying). The worst disadvantage is the weed problem mentioned above. Also, one cannot accurately estimate the quantity of actual seed in a given batch of the mixed hay, nor the proportions of the various seeds within it. Thus it is wasteful of seed, and gives unpredictable results. The mixture necessarily contains late-maturing species.

2nd handout

Cold damp storage (stratification) of seed. Experiment here and elsewhere has shown that seeds of most prairie species germinate better (and in some cases only) if they have been stored cold and damp for a while. (This is the procedure long known to nurserymen as "stratifying", this word referring to the old procedure of storing seeds in

layers between layers of damp sand in boxes or pits.) Certain chemical changes take place in seeds exposed to low temperatures and moistures, which enable the embryos to "break dormancy" and resume growth. This process is used for most of the prairie plants which mature their seed in summer or fall; it is not used for some seeds which mature in spring or early summer, which should be planted in soil as soon as collected.

The cold damp storage treatment is very simple: Our standard procedure has been to mix the seed with at least an equal volume of damp fine sand (silica sand or beach sand) and put the mixture in a polyethylene bag which is tightly closed and placed in a refrigerator kept approximately between 32 and 38 degrees Fahrenheit. A two-month treatment is adequate for most seeds, and therefore we usually start treatment about the first of February for planting in the greenhouse the first of April; this operation can be delayed for spring broadcast or drilling. Seeds should not be stored damp and cold too long, however, as they slowly lose their viability.

SEEDLING TRANSPLANT METHOD. (The procedures as described apply to a situation where a greenhouse is available; if a greenhouse is not available, all operations are adaptable to outdoor conditions, but should be delayed a few weeks.)

Sowing the seed. For greenhouse operations the stratified seed is sown about April 1, along with the sand with which it was stored, in flats (shallow wooden boxes). The flats are first nearly filled with soil that has been sterilized (preferably by heating) to kill the weed seeds. The prairie seeds should be sown shallowly; in most cases it is sufficient just to press them into firm contact with the surface of the soil with a block of wood, and then lightly sprinkle the surface with loose soil. (various kinds of artificial soil mixes, sphagnum, etc., can be used; we regularly use steam-sterilized field soil.) The flats are then set in a shallow vat of water and soaked until moisture appears on the surface; not flooded! Then the flats are gently set on the greenhouse bench and covered with wrapping paper to retain moisture. Greenhouse temperatures at this time are usually kept between 50 degrees at night and 80 on the brightest days. When the seedlings begin to emerge, the paper should be taken off, but the seedlings should still be protected from intense heat by shading the greenhouse on hot days. After the first watering in the vat, the flats are watered when necessary by sprinkler nozzle on a hose or can.

Inoculating legumes. Most prairie members of the family Leguminosae thrive better if certain bacteria (in the genus *Rhizobium*) are living symbiotically on their roots. These bacteria can be obtained in cultures under the trade name Nitragin; the cultures are ordered according to the legume species, from Nitragin Sales Corporation, 3101 West Custer Avenue, P. O. Box 6186, Milwaukee, WI 53209. The usual procedure is to mix the Nitragin with the seeds just before sowing; by this method there seems to be some danger of over-inoculation, because of the small quantity of seed usually used. As an alternative, we often mix the Nitragin with the soil used for banding the seedlings in the operation described below. For SPRING BROADCAST or DRILL, the Nitragin is mixed freely with the seed just before sowing in the field.

Banding the seedlings. When the seedlings have true leaves and the roots are strong enough to survive handling, the seedlings are transferred, singly or in small tufts, into wood-veneer plant bands in other flats, again in sterile soil. (In recent years these plant bands have been hard to get, and some workers are using peat pots, preferably in strips, in essentially the same way as the bands.) It is important to firm the soil well around the

seedlings; the band should be well filled with firm soil, with the seedling standing just a little deeper than they were in the seed flat. When filled, these flats are set in a vat for their first watering, then set on the greenhouse bench.

Achieving a mixture. Up to this point we usually keep the seeds and seedlings separated as to species. If the plants are to be used in designed landscapes, experimental or display plots, etc., they may be kept separated, but usually we mix them after they have been banded, because we are trying to create a diverse community, simulating the original prairie. Our usual procedure, when the earth in the bands holds together so they can be handled, is to transfer the bands again to other flats, lining them up in longitudinal rows, one species per row, with natural associations in a given flat (depending on weather the flatful is to be planted in a moist, mesic, dry, or sandy place in the field). In any flat, there should be more warm-season grasses than the total of forbs and cool-season grasses. Note: We have tried many variations of these operations, such as (a) planting pinches of mixed seed directly in bands, and (b) banding seedlings of two or more species in the same band; there is no "right" or "best" way.

Transplanting in the field. If seedlings have been raised in April in the greenhouse, they are ahead of normal growth for the season and tender to frost; therefore transplanting in the field should be delayed until danger of frost is past. Unfortunately the date of last frost varies about a month. We usually take some risk and begin transplanting about the middle of May.

The field soil should be freshly tilled, preferably by a roto-type machine, and thus free of growing weeds, and should be fairly smooth, free of clods, and moist but not muddy. The workers kneel or hunker on a plank (so as to distribute their weight and not compact the soil); the plank also supports flats of mixed seedlings. We have built a special planting plank 2' x 10' with a pair of lifting handles at each end, an angle-iron protruding into the ground around the perimeter, and bolts sticking into the ground in the center of each of the 20 square feet. Using a trowel, the worker plants one band in each square foot, making sure the bottom of the soil in the band is firmly pressed by moist soil in the hole. Nevertheless, there should be a covering of rough, loose soil on the surface at the right level for the plant.

Weeding the planting. Taking care to say out of the planting when the soil is muddy, the workers can walk through the banded planting with a sharp hoe and slice off the weeds between the prairie plants; if the weeds are sparse, they can be removed by a combination of pulling and cutting below the crown with a sharp, hook-bladed linoleum knife. Normally a banded planting has to be weeded two to three times during the first growing season (in May or June). If the planting and this early weeding are carried out successfully, there is rarely any further maintenance except by fire.

Use of fire. Regardless of the method used in establishing prairie, burning the dry plants as they stand in the field has proved to be extremely useful in fighting weeds, preventing woody invasion, and promoting good health and long life for all the prairie plants. In the Chicago region the best time for fire seems to be between March 20 and April 10; fire at this time does little harm to prairie plants but controls weeds effectively. Delaying the fire until this time conserves soil and water and provides wildlife habitat through the winter; this delay also lets many weeds start spring growth, becoming highly vulnerable to fire. Burning at a later date could damage prairie plants. We have not used flame-throwers or additional fuel, but rather have let the prairie burn naturally after being

ignited by a match. We try to burn a new planting in the spring when it has first become dense enough to sustain fire, and thereafter in alternate years. A portion of our total project is thus left unburned each year for maintaining populations of insects and other prairie organisms which winter at or above the soil surface. Fire is dangerous and should be used only with great caution; burning should not be attempted on windy days. In certain areas open burning of this kind is now restricted by the pollution Control Board and Environmental Protection Agency.

Evaluation of the SEEDLING TRANSPLANT method. Prairie establishment with seedlings transplanted from the greenhouse has these advantages: It requires very little seed. It gives prairie plants a head start over weeds. It allows full control over the location of each plant and thus of initial composition of the community. It spaces the plants in regular patterns allowing almost mechanical weed control, even by relatively untrained helpers.

The method has these disadvantages: It requires a tremendous input of time, effort, expensive greenhouse space, and specialized materials and equipment. The resulting prairie has an artificial look which will persist for years or decades.

SPRING BROADCAST

Sowing in field. Seeds are processed as with the TRANSPLANT method, but instead of being sown in flats in April, they are sown directly in their permanent home in the field in May or June. (Perhaps by coincidence, several plots planted on May 12 of various years are among our finest prairie plantings.) However, with luck in regard to rainfall, one can succeed with Spring Broadcast as late as July!

Before being sown, the seeds of several species (together with the sand in which they were stratified) are mixed together in desired proportions. About half the total volume should be that of warm-season grasses. If there are legumes, the proper strains of Nitragin are added at this time (see Inoculation above). Rate of seed distribution is hard to estimate, because of size differences, soil condition, etc. A suggested rate is about four quarts of seed-sand mixture to 1000 square feet; handled in larger lots, about four bushels will plant an acre.

However, before actual broadcast begins, this mixture should be diluted with at least twice its volume of dry Terralite; this addition makes possible more uniform distribution because of the bulk and high visibility of the Terralite. Perlite or other chemically inert dilutants can be used just as effectively. The final mixture is scattered thinly and evenly over the field, and then, before the seed can dry out, the surface of the soil is raked lightly, and the entire area is rolled with a lawn roller to bring the seed into contact with moist soil. Most seeds that have been stratified germinate shortly after being sown in warm weather; if they do not receive enough moisture to sustain life when they germinate, they die. Having no facility for sprinkler irrigation, we have lost many acres of seeding because the ground was too dry at time of seeding, and the rain did not come soon enough.

To avoid the risk of losing the whole planting because of drying out, one can plant unstratified, i. e. dry-stored seed; but usually the percentage of emergence from unstratified seed is very low, except with commercially produced grass seed.

Weeding the broadcast planting. We regularly weed a seeded field the first time by hunkering or kneeling on a plank (usually a heavy plywood 1' x 10') and pulling or cutting the weeds individually from among the prairie seedlings. By far the best tool we

have found for this operation is a hook-bladed linoleum knife, kept razor-sharp by frequent use of a pocket whetstone. The weeders proceed through the field on strips sharply marked by taut cords. Weeding this kind of planting, where many species of prairie seedlings are intricately mingled with many kinds of weeds, requires a great deal of botanical knowledge, good eyesight, and strong motivation. The second weeding of the summer can be accomplished from a standing position, without a plank; weeds are often so tough at this stage that a small pruning shears is used. A successful early seeding often forms a stand capable of sustaining fire by the end of the first growing season, and needs no weeding the next year; a later or less successful seeding will not be able to carry fire the next spring, and will still need weeding that spring.

Evaluation of the SPRING BROADCAST method. This procedure gives a far more natural-looking prairie than the Seedling Transplant method, and requires relatively little input of time, effort, equipment, or facilities. Its disadvantages are: It requires (and wastes) a great quantity of seed to cover a given area, since a high percentage of seed is covered too shallowly if at all, and some gets in too deep. Furthermore, for the weeding operation it requires reliable, highly-trained workers, and a tremendous number of man-hours.

A modification of Spring Broadcast: Hand sowing in rows. To economize on seed and to simplify weeding, one can modify the Spring Broadcast method by sowing the seed in rows marked by a taut cord--up to 18" apart. This operation is the same as planting radishes or lettuce in the kitchen garden. The worker marks a row by digging a shallow trench with a hoe, scatters the mixed seed in the row, and (omitted word) by foot or with a roller.

This method leaves no question as to where the prairie plants are. Its main disadvantage is that the rows may persist for decades, creating an unnatural-looking "prairie". Also, it tends to place plants of the more delicate prairie species under too close competition from their stronger neighbors.

FALL BROADCAST

Seed collecting and sowing. This operation has been very successful in cases where a strip of prepared field is adjacent to a strip of established prairie. Late October is the usual time. Prairie seeds are collected rapidly and indiscriminately by stripping or clipping off entire inflorescences. This material is mixed and trampled on a dropcloth or in a large tub, and then scattered (stems, leaves, and all) over the freshly tilled ground. This "seed hay" is mixed with the soil by light raking, and receives no further attention until the next spring, since dormancy requirements are met by natural weather factors.

Weeding. The same weeding procedure is used as with Spring Broadcast, but in the case of Fall Broadcast the weed threat is much worse. Most prairie seeds do not germinate until May, but in the meantime many weed seeds are germinating in fall and early spring, so that by May there is already serious competition. Therefore this method requires earlier, more laborious, and more frequent weeding.

Evaluation of Fall Broadcast. Because of the mulching effect of the "hay", Fall Broadcast is useful on ground that is subject to severe erosion. It has the further advantage of being carried out at a time of the year when most folks are less busy than in spring. It is fast, requiring almost no handling of the seed (i. e. no cleaning, storing, or stratifying). The worst disadvantage is the weed problem mentioned above. Also, one cannot accurately

estimate the quantity of actual seed in a given batch of the mixed hay, nor the proportions of the various seeds within it. Results are thus unpredictable. Also, a mixture collected and scattered as described above contains only late-maturing species; however, certain early-maturing seeds (such as *Stipa spartea*) can be stored dry and added to this fall broadcast to enrich it.

THE NISBET DRILL

Ordinary grain drills, such as farmers use for planting crops, are not adapted to sowing the varied and often light and chaffy seeds of prairie plants. For this kind of seed there is a specially designed machine, the Nisbet Drill, made in San Angelo, Texas. It can be purchased through Mr. Jim Wilson, Wilson Seed Farms, Polk, Nebraska 68654. Mr. Wilson also provides practical advice on the use of the drill. We know of many cases where it has been very successful in establishing stands of major prairie grasses by using commercially produced seed of selected strains of these grasses, such as are also available from Wilson Seed Farms.

There are valid reasons to suspect, however, that at least some of these strains are so aggressive that they may have seriously destructive long-term effects on local prairie remnants. In the Morton Arboretum restoration project we used the Drill only for locally-collected seed, which had been stratified and mixed. These seedings failed, but not because of factors intrinsic to the drill.

VEGETATIVE METHODS

There is a danger that prairie enthusiasts, misled by unrealistic recommendations in literature, may dig up wild prairie plants expecting them to reproduce by cuttings, divisions, or other vegetative means, as readily as do common garden perennials. Actually only a few prairie plants are known to have the capacity for successful response to these standard horticultural procedures. In general plants which quickly form large vegetative colonies by rhizomes can be increased by digging and transplanting (from a nursery bed or restoration) rooted shoots. This is also true of plants which form many-stemmed clumps, from which you can separate shoots with associated roots. Bulb-forming plants such as *Allium cernuum* can be thus divided with great success.

Even where vegetative increase is possible, it is not as desirable as increase by seed; seed yields genetically diverse populations of a given species while vegetative methods yield genetically uniform clones.

SODS or "plugs" dug from remnant prairies. This method is a crude variation of vegetative propagation, which is justified only as an emergency salvage operation when a prairie remnant is actually being destroyed and cannot be saved in situ. When the Northern Illinois Gas Company destroyed a prairie remnant at the east end of the Morton Arboretum in summer of 1964, we salvaged a few sods and planted them in two strips in the restoration area. Many of the higher-quality prairie plants died out quickly, and the strips became very weedy because of weeds already present in the sods. A notable and desirable increaser after this operation is the highly rhizomatous *Comandra richardsiana*; it is conceivable that a few species can be perpetuated only by digging, because of mycorrhizal or parasitic requirements.

Combined versions introduction

The following are some plants of Chicago-region prairies, with notes based on propagation experiences with each, based on work done 1963-1967 at the Morton Arboretum, Lisle, Illinois. Nomenclature is that of GRAY'S MANUAL, 8TH EDITION. Abbreviations are intended to be self-explanatory. Ecology and phenology are for Chicago region only. Cultivation data are based on work done 1963-1967 at the Arboretum. Plants are long-lived perennials unless otherwise noted. Heights are estimated average for mature inflorescence of cultivated plants.

Combined versions information.

Species Kind of prairie Time & COLOR of flower Time of seed harvest Height of plant, propagation methods, special problems, ornamental values, etc. Propagation methods, special problems, performance, etc.

Allium cernuum Moist to mesic prairie blooms late July to late August, PALE PINK. Harvest October. 1/1/2'; easy by method #1, easy by SEEDLING TRANSPLANT; blooming 2nd year; a reliable garden plant, forming clumps. Poor results in field seeding. Self sows freely, once established.

Amorpha canescens Mesic to dry prairie. Blooms late June to mid July; DEEP PURPLE. Harvest October. 2'; Success with SEEDLING TRANSPLANT and 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.

Andropogon gerardii Moist to dry; general prairie. Blooms August to early September; STAMENS MAROON. Harvest October. 6'; all methods work; successful by ALL METHODS; blooms 1st year if sown early. Slowly forms large sods. An essential warm-season grass; good fall color. Best-known prairie grass, warm-season, Strong competitor; delicate forb seedlings may be overwhelmed.

Andropogon scoparius Mesic to dry. Blooms mid August to mid September; STAMENS MAROON. Harvest October. 3'; culture as above, successful by ALL METHODS. Flowers 1st year; but not sod-forming. Has best fall color of any prairie plant. Warm season grass.

Anemone canadensis Moist to mesic prairie. Blooms late May to mid July; PURE WHITE. Harvest August-September. 1 1/2'; percent of germination very low, but rapidly forms large vegetative colonies. Only method #1 tried. Three SEEDLING TRANSPLANTS of 1964 have become a vegetative colony of many square rods.

Anemone cylindrica Mesic to dry prairie. Blooms mid Jun to mid July; GREENISH WHITE. Harvest October. 2'; easy by method #1. Successful by SEEDLING TRANSPLANT. No results from other methods. Blooms 2nd year. No results from other methods to date.

Anemone patens wolfgangiana Dry hill tops. Blooms April; PALE VIOLET. Harvest June. 8"; plt seeds while fresh, transplant next spring; flowers following spring. Seeds should be planted while fresh; emergence occurs same season. Susceptible to spring fire, needs small neighbors of low fuel content.

Asclepias hirtella Mesic, dry, esp. sandy prairie. Blooms late July, early August; GREENISH. Harvest late September. 2'; only method #1 tried. Only SEEDLING TRANSPLANT method tried; seedlings weak first two years; flowers 3rd year.

Asclepias meadii Mesic prairie. Blooms June; GREENISH. Harvest August. We have only 2-year seedlings, raised by method #1; seedlings very weak, have not bloomed. Seed from Missouri.

Asclepias sullivantii Moist to mesic prairie. Blooms July; PINK. Harvest October. 3'; method #1; seedlings weak 1st year, bloom 3rd year. Does well in garden, foliage and flowers attractive. Seedlings easy to raise and transplant, but usually seem to be out-competed in restoration plots; good as a garden plant.

Asclepias tuberosa Dry, esp. sandy prairie. Blooms late June to late August; ORANGE. Harvest October. 2'; easy with method #1, often a few plants flowering late the 1st year, all the 2nd. Reliable garden ornamental. Successful by SEEDLING TRANSPLANT.

Asclepias viridiflora Mesic to dry or sand. Blooms late June to mid July; GREENISH. Harvest early October. 1 1/2'; method #1, seedlings very weak 1st year, delicate first 2 years, begin bloom 3rd year. Shoots come up late each spring; true of most *Asclepias*. SEEDLING TRANSPLANT.

Aster azureus Mesic to dry or sand prairie. Blooms early September to mid October; PALE VIOLET-BLUE. Harvest late October. Over 3' and coarse unless given competition; methods #1 & #3. Flowers late 1st year by SEEDLING TRANSPLANT. Also successful by FALL BROADCAST.

Aster ericoides General prairie. Blooms late September; WHITE. Harvest late October. 2', seed seems to germinate poorly, but when established plant is rather weedy, forming vegetative colonies. I've got poor germination by SEEDLING TRANSPLANT; but plants are aggressive, forming large vegetative colonies.

Aster laevis Moist to mesic prairie. Blooms early September to early October; MEDIUM VIOLET-BLUE. Harvest late October. 3' or more unless given close competition; easy by methods #1 and #2. Easy by SEEDLING TRANSPLANT and SPRING BROADCAST. Transplanted seedlings bloom late 1st year. Freely self sows.

Aster ptarmicoides Dry hill or sand prairie. Blooms early August to mid September; WHITE. Harvest early October. 1 1/2'; methods #1 and #3. One of the best prairie asters, a neat, small plant for sue in the dry garden. Successful by SEEDLING TRANSPLANT and FALL BROADCAST.

Aster sericeus Mesic to dry hill prairie. Blooms mid September to early October; BRIGHT VIOLET. Harvest mid October. 1 1/2, very easy by method #1. Very easy by SEEDLING TRANSPLANT, with flowers late 1st year. Foliage highly ornamental.

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, and by SPRING BROADCAST. Legume, inoculate. Some seedlings damp off. Shoots come up late in field each spring.

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 and SPRING BROADCAST. Legume, inoculate. Shoots come up late. An exquisitely beautiful plant at any stage. Foliage exquisite; one of best for garden use.

Bouteloua curtipendula Dry prairie. Blooms early August; STAMENS SCARLET. Harvest early October. 2'; methods #1 & #2. Successful by SEEDLING TRANSPLANT and SPRING BROADCAST. Highly ornamental bunch grass, though with little fall color. Highly ornamental structure, though fall color is drab; flowers late 1st year.

Bromus kalmii General, alkaline prairie. Blooms July; spikes furry. Harvest early October. 2'; easy by methods #1 & #3; #2 not tried. Successful by SEEDLING TRANSPLANT, SPRING BROADCAST, and FALL BROADCAST. Cool-season; no fall color, little fuel; flowers 2nd year. Must be carefully distinguished from weedy bromes.

Cacalia tuberosa Moist to mesic prairie. Blooms late June, early July; WHITE. Harvest late July. 2'; method #1, but germination low. Successful by SEEDLING TRANSPLANT, with flowers 2nd year. A quality plant, most attractive while in bud.

Carex bicknellii Mesic prairie. Blooms late May; CREAM. Harvest July. 2', method #1. SEEDLING TRANSPLANT; by this method forms thick, long-lived clumps, but in nature is sparsely scattered; flowers 2nd year. Not a grass substitute; makes little fuel.

Castilleja coccinea Moist to dry prairie. Blooms late May. Harvest late June. I have established it only by scattering fresh seeds on established restored prairie. Annual or biennial.

Castilleja sessiliflora Dry sand prairie. Blooms June. Harvest August. Perennial. As with *C. coccinea*, I have established it only by scattering fresh seed in our artificial sand barren.

Ceanothus americanus Mesic to dry, sand prairie. Blooms late June to late July; WHITE. Harvest September. 2'; method #1, but germination low. SEEDLING TRANSPLANT. Desirable shrub blooming on new wood, but in cultivation plants die unpredictably. Fruits explode, so time of seed collection short.

Cirsium hillii Dry to mesic prairie. Blooms late June; PURPLE. Harvest late July. 1 1/2'; easy by method #1, but plants in cultivation are short-lived, susceptible to aphids; blooms 2nd year, then dies.

Comandra richardsiana General prairie. Blooms late May, early June. Harvest August? Have raised a few by sowing stratified seeds in flat with banded grasses. Spreads from salvaged sods.

Coreopsis palmata Mesic prairie. Blooms late June to late July; YELLOW. Harvest November. 1 1/2'; easy by method #1. SEEDLING TRANSPLANT. Blooming 2nd year. A reliable garden plant. Forms compact vegetative colonies. Foliage turns black in fall.

Coreopsis tripteris General prairie. Blooms mid August to mid September; YELLOW. Harvest November. 5'; easy by methods 1, 2, & 3. Successful by SEEDLING TRANSPLANT, SPRING BROADCAST, and FALL BROADCAST; flowers 2nd year.

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

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

Dodecatheon meadia General prairies; also woods. Blooms early May to early June; PINK. Harvest August to October. 1'; method #1, but cotyledons only 1st year; SEEDLING TRANSPLANT, but early growth very slow; flowers 3rd or 4th year. Sensitive to spring fires. A gratifying garden plant.

Echinacea pallida Mesic to dry prairie. Blooms late June & early July; PURPLE. Harvest November! 2 1/2'; all methods successful. Successful by SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST. Too coarse without competition. Flowers 2nd year. Rodents eat roots. Achenes tight in heads until November.

Eryngium yuccifolium Moist to dry; general prairie. Blooms early July to early August; WHITE. Harvest late October. 4'; easy by method #1, blooming late 1st year; gets coarse & tall. Try with method #2 with much grassy competition. SEEDLING TRANSPLANT, SPRING BROADCAST; reseeds freely once established. Flowers 2nd year.

Euphorbia corollata Mesic to dry & sand prairie. Blooms mid June to mid September; WHITE. Harvest early September. 2'; method #1. Successful by SEEDLING TRANSPLANT; flowers 2nd year. Seed hard to get because fruit explodes upon ripening.

Galium boreale Mesic prairie. Blooms late June, early July. harvest August. SEEDLING TRANSPLANT; spreads rapidly by long rhizomes, but is not weedy.

Gentiana andrewsii Moist prairie. Blooms early September to mid October. BLUE. Harvest November. 1 1/2'; method #1, but seedlings spent full year in seed flat; SEEDLING TRANSPLANT; bloom 3rd year; the easiest of the gentians.

Gentiana flavida Moist to mesic prairie. Blooms early September. Harvest late October. SEEDLING TRANSPLANT; ours flowered abundantly the 3rd year.

Gentiana puberula Mesic to dry prairie. Blooms mid September to early October; DEEP BLUE. Harvest November. 1'; method #1, SEEDLING TRANSPLANT; but seedlings very delicate, usually die; needs better care in early seedling stage than I gave it; survivors bloom 4th year. Needs short but close competition. Beautiful.

Geum triflorum Dry hill prairie. Blooms late April & early May; RED SEPALS PINK PETALS. Harvest June. 1'; method #1, or sow seeds as soon as collected. Successful by SEEDLING TRANSPLANT. Sensitive to spring fires; can thrive in poor soils without grass. Best planted with small neighbors to avoid excessive damage by fires; flowers 2nd year.

Helianthus laetiflorus rigidus General prairie. Blooms late August to mid September; YELLOW. Harvest October. 3'; all methods work too well; SEEDLING TRANSPLANT; soon

forms large colonies by rhizomes; needs tight competition. Very aggressive at first, but when community mature, is no problem. Rhizomatous. Flowers 1st year.

Helianthus mollis Dry prairies. Blooms August; YELLOW. Harvest October. 3'; all methods work well; SEEDLING TRANSPLANT, SPRING BROADCAST. Flowers late 1st year. Foliage attractive and flowers large; seeds especially liked by goldfinches. Aggressive at first and highly rhizomatous, but not weedy in long run.

Helianthus occidentalis Dry & sand prairie. Blooms early August to mid September; YELLOW. Harvest October. 3'; all methods work well; SEEDLING TRANSPLANT; too coarse; flowers 1st year, blooming late; rapidly forms large vegetative colonies by rhizomes, levels off later; apparently highly allelopathic.

Heliopsis helianthoides Moist to mesic prairie. Blooms early July to mid August; ORANGE-YELLOW. Harvest October. 3 1/2'; all methods; SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST; flowers late 1st year. Coarse in garden, but no problem in field. Not weedy.

Heuchera richardsonii grayana General prairie. Blooms late May to late June; CHARTREUSE. Harvest late July. 2'; method #1 only; SEEDLING TRANSPLANT only; seeds tiny but emergence good, growth reliable; blooms 2nd year. Evergreen foliage in tight clump; fine, reliable ornamental.

Hierochloë odorata Moist, alkaline prairie. Blooms early May; GOLD. Harvest June. 10", have tried only a few seed, used method #1 successfully. SEEDLING TRANSPLANT. Highly rhizomatous, so that VEGETATIVE METHODS are strikingly successful. Forms colonies by rhizomes. Desirable for fragrance.

Koeleria cristata Dry, esp. sand prairie. Blooms mid June to early July; PLATINUM. Harvest August. 1'; easy by method #1, SEEDLING TRANSPLANT; blooming 2nd year; inflorescence spectacular. A cool-season grass which is not very competitive and gives little fuel, little competition to weeds.

Kuhnia eupatorioides corymbulosa Dry prairie. Blooms late August through September; CREAM. Harvest October. 2'; methods #1 and #3; SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST, NISBET DRILL. Too coarse for rich garden soil; good in field with competition. Flowers 2nd year; slightly weedy farther west.

Lespedeza capitata Mesic to dry; sand; general prairie. Blooms mid August to early September; WHITE & PURPLE. Harvest late October. 3'; methods #1 and #2; SEEDLING TRANSPLANT, SPRING BROADCAST. Legume, inoculate. By seedling, flowers 2nd year. Seedlings tend to damp off in flats. Blooms 2nd year. Seedlings tend to frost-heave first winter.

Lespedeza leptostachya Dry prairie. No notes taken. Harvest October. 2'; little seed available, only method #1 used. Blooms 2nd year; grows weakly, susceptible to herbicides.

Liatris aspera Mesic to dry & sand prairie. Blooms mid August to late September; PURPLE. Harvest October. 2 1/2'; method #1; SEEDLING TRANSPLANT. Blooms 2nd year. Floppy and gross in garden, needs competition.

Liatriis cylindracea Dry hill or sand prairie. Blooms late August & early September; PURPLE. Harvest October. 14"; method #1; SEEDLING TRANSPLANT. Blooming 2nd year; first year seedlings have only one linear leaf, are easily lost in hoeing.

Liatriis pycnostachya Mesic prairie. Blooms late July, early August; PURPLE . Harvest October. 3'; method #1; SEEDLING TRANSPLANT. Blooming 2nd year; needs staking in the garden because of excessive growth.

Liatriis spicata Moist to mesic prairie. Blooms early August to early September; PURPLE. Harvest October. 5'; method #1; SEEDLING TRANSPLANT, SPRING BROADCAST. Blooming 2nd year; needs competition, too coarse and floppy for garden. The most aggressive of the genus.

Lithospermum canescens Mesic to dry prairie. Blooms mid May to mid June; ORANGE. Harvest July. 10"; SEEDLING TRANSPLANT, but seeds should be sown while fresh for emergence next spring; they are hard to get; seedlings grow weak, usually die. Plants grow poorly. Highly desirable ornamental.

Lithospermum incisum Dry hill or sand prairie. Blooms mid May to early June; YELLOW. Harvest July. 10"; seeds should be planted fresh; seedlings emerge next spring & bloom the following, but plants seem short-lived in cultivation.

Lythrum alatum Moist prairie & marshes. Blooms late June through August; PURPLE. Harvest September. 1 1/2'; seeds tiny, but germinate well with method #1 if flat sits in water; SEEDLING TRANSPLANT. Bloom 2nd year.

Monarda fistulosa General prairie & other habitats. Blooms early July through August; PALE VIOLET. Harvest October. 3'; easy by method #1, SEEDLING TRANSPLANT. Blooming 2nd year. Rhizomatous and almost weedy, but desirable for attracting insects.

Oenothera pilosella Moist prairie. Blooms mid June to early July; YELLOW. Harvest September. 1 1/2'; seed minute, but germinates & grows well by method #1; SEEDLING TRANSPLANT. Seeds small, but grow well, with flowers late 1st year. Forms mat of short stolons. Plants short-lived?

Panicum leibergii Mesic prairie. Blooms June? Pistils MAROON. Harvest July? 8"; SEEDLING TRANSPLANT. Seeds should be sown while fresh for germination next spring. Blooms late 1st year. A handsome cool-season grass.

Panicum virgatum General prairie. Blooms late July to mid September; inconspicuous. Harvest October. 4'; easy by all 3 methods, SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST, NISBET DRILL. Blooming late 1st year if sown early. Seed viable 3 years. Somewhat coarse for garden use.

Parthenium integrifolium General prairie. Blooms late June to early August; WHITE. Harvest October. 3'; very easy by methods #1 and #2, blooming late 1st year by #1. SEEDLING TRANSPLANT, SPRING BROADCAST. Flowers late 1st year. Attractive before and after bloom; a good garden plant.

Penstemon pallidus Dry calcareous prairie. Blooms late May, early June; WHITE. Harvest August-September. 14"; method #1, SEEDLING TRANSPLANT. Seed small, but plants do well, blooming 2nd year.

Petalostemum candidum Mesic to dry prairie. Blooms early July to early August; WHITE. Harvest late September. 20"; seedlings damp off in method #1; #2 is best, SEEDLING TRANSPLANT, SPRING BROADCAST, and NISBET DRILL, with plants often blooming late 1st summer if planted early! Legume, inoculate.

Petalostemum purpureum Mesic to dry prairie. Blooms early July to late August; PURPLE. Harvest October. 20"; seedlings damp off in method #1; #2 is best. SEEDLING TRANSPLANT, SPRING BROADCAST. Legume, inoculate. Flowers 2nd year. A good garden ornamental, no problems after seedling stage.

Phlox glaberrima interior Moist prairie. Blooms late June to early August; MAGENTA. Harvest August. 20"; SEEDLING TRANSPLANT. Seed hard to get because capsules explode; should be sown while fresh; seedlings emerge next spring, bloom next.

Phlox pilosa Mesic to dry prairie. Blooms mid May to early July; MAGENTA. Harvest July. 1'; SEEDLING TRANSPLANT, seed hard to get; see above. The prairie element is early blooming; late dates are a pale sand element. (N. B. The prairie element of this plant blooms early; a pale sand ecotype continues much later).

Physostegia virginiana Moist to mesic prairie. Blooms early August to mid September; PINK. Harvest October. 4'; method #1. SEEDLING TRANSPLANT, SPRING BROADCAST. Blooms 2nd year. Plants get too tall unless they have close competition.

Polytaenia nuttallii General prairie. Blooms June; CREAM. Harvest August-September. 2 1/2'; SEEDLING TRANSPLANT, SPRING BROADCAST. Stratify seeds 3-4 months. Rosettes first 2 or 3 (many) years; each plant always dies after it blooms and seeds.

Potentilla arguta General prairie. Blooms early July to early August; WHITE. Harvest October. 2 1/2'; easy by method #1, SEEDLING TRANSPLANT, SPRING BROADCAST. Even though seeds small, emergence and growth good; blooms 2nd year; a good garden ornamental, but susceptible to aphids.

Prenanthes aspera Mesic to dry prairie. Blooms August; CREAM. Harvest October. 4'; method #1; SEEDLING TRANSPLANT. Blooms 2nd or 3rd year; erratic or intermittent. Emergence and early growth good, but after 8 years only a few plants remain.

Prenanthes racemosa Moist to mesic prairie. Blooms mid & late September; PALE PURPLISH. Harvest October. 4'; method #1; SEEDLING TRANSPLANT. Life history in cultivation as above, except that the plants seem longer lived than *P. aspera* with us.

Psoralea tenuiflora Mesic to dry prairie. Blooms mid June to early July; BLUE. Harvest early September. 20"; method #1, SEEDLING TRANSPLANT, though seedlings tend to damp off. Legume, inoculate; flowers 2nd year. Shoots come up very late in spring. Seeds hard to get.

Pycnanthemum virginianum Moist to mesic prairie. Blooms late July to mid September; WHITE. Harvest October. 2'; easy by method #1 though seeds small; SEEDLING TRANSPLANT. Blooms 2nd year and is reliable; desirable for fragrance, the most fragrant of our prairie plants. In recent years we find very little seed; flowers 2nd year.

Ranunculus rhomboideus Dry hill prairie. Blooms late Apr; YELLOW. Harvest late May. 4"; seed should be sown while fresh; germinates same season & blooms the next spring. Neighbors must be short.

Ratibida pinnata General prairie. Blooms early July to mid August; YELLOW. Harvest October. 4'; easy by all methods, SEEDLING TRANSPLANT, SPRING BROADCAST, blooming 2nd year and reliable. Too big and weedy except in broadcast seeding with close competition. Gross and weedy in appearance until the community stabilizes; then no problem.

Rosa carolina General prairie. Blooms late May to mid July; PINK. Harvest October. 2'; taxonomically a complex. SEEDLING TRANSPLANT. Retain seed flat until 2nd spring, when most emergence occurs; spreads by rhizomes forming loose colonies. Flowers on old wood.

Ruellia humilis Dry prairie. Blooms mid June to late August; PALE VIOLET. Harvest September. 1'; easy by method #1, blooming 2nd year; reliable if uninspiring garden plant.

Salix humilis General prairie. Blooms mid Apr to early May; (catkins). Harvest May. 2'; seed must be sown immediately, but even then seedlings rarely survive. Poor luck with cuttings too. A shrub, flowering on old wood. Seeds must be sown fresh, but my results poor even then; poor results with hardwood cuttings.

Scutellaria parvula leonardii Dry prairie. Blooms early & mid June; PURPLISH BLUE. Harvest July. 6"; method #1, SEEDLING TRANSPLANT, blooming 2nd year. Extremely well adapted to VEGETATIVE METHODS; forms colonies by tuberous rhizomes which can be divided for propagation.

Senecio pauperculus balsamitae Moist prairie. Blooms late May to late June; YELLOW. Harvest July. 1'; method #1, SEEDLING TRANSPLANT, blooming 2nd year; successful in beds, but has not persisted in field with competition; rhizomatous.

Silphium integrifolium deamii General prairie. Blooms mid July to late August; YELLOW. Harvest late September. 5'; all methods work well; SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST. Blooms 2nd year, reliable; too weedy for garden or for #1 in field; use #2 or #3 with much grass. With us this has been the weediest of all the plants we call "prairie".

Silphium laciniatum General prairie. Blooms late June to early August; YELLOW. Harvest early October. 6'; easy by #1 & #2, SEEDLING TRANSPLANT, SPRING BROADCAST; blooming 3rd or 4th year; has only one true leaf 1st year. Adult leaves much prized for arrangements.

Silphium terebinthinaceum General prairie. Blooms early July to early September; YELLOW. Harvest early October. 7', easy by #1 & #2, SEEDLING TRANSPLANT, SPRING

BROADCAST; blooming 3rd year; only 1 true lf 1st year, flowers 3rd year. Adult leaves used for arrangements.

Sisyrinchium albidum General prairie. Blooms mid May to mid June; PALE BLUE. Harvest July. 8"; easy by #1, SEEDLING TRANSPLANT; blooming 2nd year, reliable. Clumps can be divided into 40 or more plants in April after 1 growing season, plants banded like seedlings.

Solidago riddellii Alkaline, wet to dry prairie. Blooms early September to early October; YELLOW. Harvest October. 3'; easy by methods #1 and #3; SEEDLING TRANSPLANT, FALL BROADCAST; has attractive lily-like foliage.

Solidago rigida General prairie. Blooms late August to early October: YELLOW. Harvest October. 3 1/2'; easy by all methods. SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST. Too coarse for the garden; should be sown with much grass for competition.

Sorghastrum nutans General prairie. Blooms late August to mid September; STAMENS YELLOW. Harvest October. 5'; easy by methods #1 & #2, SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST, NISBET DRILL. Often blooming late 1st year. Warm-season grass. One of the best grasses for fuel and weed competition. Decorative.

Spartina pectinata Moist prairie. Blooms early July to late August; STAMENS CREAM. Harvest late October. 5'; method #1, SEEDLING TRANSPLANT; though viability is low. Growth rapid, plants grow fast and bloom late 1st year; highly rhizomatous, soon form colonies; good for erosion control in ditches.

Sporobolus heterolepis General prairie. Blooms August; inconspicuous. Harvest ~~October~~ September 21. 2 1/2'; method #1, blooming 1st year if planted early. Best by SEEDLING TRANSPLANT, but a few emerge with SPRING BROADCAST and FALL BROADCAST. The most ornamental of all our grasses, suitable for formal gardens.

Stipa spartea Mesic to dry prairie. Blooms mid June; inconspicuous. Harvest last of June; 1st of July. 2'; method #1, blooming 2nd year; but by this method plants short-lived; SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST. Broadcast in '67 with other grasses. Cool-season grass with remarkable quill-like fruit.

Valeriana ciliata Moist, alkaline prairie. Blooms mid May to early June; CREAM. Harvest late June. 20"; SEEDLING TRANSPLANT; sow seeds in flats while fresh, seedlings emerge in a few days and are transplanted to field in a few weeks; will bloom following spring; reliable. Plants stink.

Vernonia fasciculata Moist prairie. Blooms late July to late August; DEEP PURPLE. Harvest October. 3 1/2'; easy by methods #1 & #2; SEEDLING TRANSPLANT, SPRING BROADCAST. Too coarse for garden use; best used sparingly in mixture with tall grasses. When collecting seeds, be sure not to confuse this with *V. missurica*, etc.

Veronicastrum virginicum Moist to mesic prairie. Blooms early July to early August; WHITE. Harvest October. 3 1/2'; seed tiny, but easy by method #1; SEEDLING TRANSPLANT; reliable in field, but not healthy in nursery. Seeds tiny, but plants grow well, with flowers 2nd year. Attractive

Viola pedatifida Mesic to dry prairie. Blooms mid May; PURPLE-BLUE. Harvest June +. 6"; SEEDLING TRANSPLANT; seeds should be planted while fresh; there is seed production by cleistogamous flowers after the conspicuous flowers cease. Short-lived in cultivation.

Zizia aptera Mesic to dry prairie. Blooms late May to Mid June: YELLOW. Harvest August. 1 1/2'; SEEDLING TRANSPLANT; stratify longer than most; blooms 2nd year and reliably thereafter.

Zizia aurea Moist to mesic prairie. Blooms mid May to mid June YELLOW. Harvest August. 20"; SEEDLING TRANSPLANT; needs long stratification; blooms 2nd year and thereafter.

Conclusions

These notes were compiled by Ray Schulenberg for a class in prairie plant propagation at the Morton Arboretum in autumn of 1967. The list does not include all the prairie plants of the Chicago region, but only those on which sufficient propagation is available, based on successful field work at the Arboretum. Several more species are in their first year; others have been tried unsuccessfully, and others are yet to be attempted.

The first version of these notes was compiled in fall of 1967 for a Morton Arboretum class in prairie plant propagation. It is now revised for distribution in response to continuing requests from people who would like to restore prairie or just to raise a few prairie plants. The plant list included here is not complete; we have a complete list of plants in our prairie restoration plots, available on request, giving common names, families, and evaluation--but without propagation notes.

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The above information was given to me in 1981 by Doug and Dot Wade of Windrift Prairie Nursery in Oregon, Illinois. The information included 3 versions of a prairie plant propagation handout by Ray Schulenberg. I have attempted to condense the information changes in the various versions into one comprehensive handout. I have tried to maintain Schulenberg's basic format, but a skilled typist can do some things MS Word can not. Any errors or discrepancies are my fault.

Although 30 years old, this information is still accurate and very relevant to restoration in 2011. Most commercial restoration has forgotten its roots, its realities and its limitations.

dl

genesis nursery, inc.