

NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

6 Louise Drive
Chagrin Falls, Ohio 44022
(216) 338-6622

On the Fringe

THE JOURNAL OF THE OHIO NATIVE PLANT SOCIETY

Volume No. ~~85~~

July/August

Number 4

PROGRAMS AND EVENTS:

July 5 (Sunday) Dayton Chapter - 1:30 p.m. - Trip to Woodland Cemetery to see 170 species of native trees and shrubs.

July 11 (Saturday) Wilderness Center - 1:30 p.m. - Trip to Brewster Bog and Lash's Bog.

July 11 (Saturday) Division of Natural Areas and Preserves Bog and Fen workshop. Classroom and field trips to various bogs and fens. Call: Guy Denny 614/265-6453.

July 11 (Saturday) - 10:00 a.m. - Desonier State Nature Preserve - Nature Walk.

July 20 (Monday) Dayton Chapter - 7:30 p.m. - Robin Caruthers of the Hillside Trust will speak on Preservation of Native Plants.

July 25 (Saturday) Columbus Chapter - 9:00 a.m. - Field trip to Batell-Darby Creek Metro Parks to see prairie bloom.

July 25 (Saturday) - 10:00 a.m. - Conkles Hollow State Nature Preserve. Walk on the rim to view plants not found within the hollow.

August 1 (Saturday) Columbus Chapter - 8:30 a.m. - Trip to several prairies such as Killdeer Plains and Claridon Prairie.

August 1 (Saturday) - 1:00 p.m. - Conkles Hollow State Nature Preserve. Walk on the cool Gorge Trail in search of the wildflowers of summer.

August 2 (Sunday) Dayton Chapter - 1:30 p.m. - Field trip to Possum Creek Reserve Prairie.

August 8 (Saturday) - 10:00 a.m. - Rockbridge State Nature Preserve. Walk to see the colorful wildflowers of summer.

August 15 (Saturday) - 1:00 p.m. - Conkles Hollow State Nature Preserve. Field trip to view the many species of ferns that live in the Hollow.

✓ **August 15 (Saturday) Cleveland Chapter - 9:30 a.m.** - Field trip to Old Woman Creek State Nature Preserve. There will be a 1½ hour lecture in the classroom, on what to look for, then out in the canoes for the rest of the morning. In the afternoon we will go to Erie Sand Barrens Preserve, a closed scientific preserve, home to several species of very rare flowers. LIMITED to 20. Call 338-6622.

✓ **August 21 (Friday) Wilderness Center State Weekend** for Ohio Native Plant Society. See article below.

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Athens	-	Ingrid Chorba	-	614/592-2543 Eve.
Cleveland	-	Tom Sampliner	-	216/932-3720 Eve.
Cincinnati	-	Jim Innis	-	513/385-0670 Eve.
Columbus	-	Jim Stahl	-	614/882-5084 Eve.
Dayton	-	Ellen Fox	-	513/897-8139 Eve.
State Nature Preserve	-		-	614/265-6453
Toledo Organizer	-	Denise Gehring	-	419/535-3058 Work
Wilderness Center	-	Glenna Sheaffer	-	419/289-6137 Eve.

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DO NOT FORGET THE WILDERNESS CENTER WEEKEND - AUGUST 21-23

The members of the Wilderness Center group have worked very hard to provide us with an outstanding agenda of field trips and programs. SEE PAGE 17 OF THE MARCH/APRIL NEWSLETTER, or call 216/359-5235.

Come and spend the whole weekend, or come for selected times. BUT COME!!! It will be fun and educational, and there are activities to suit all interests and abilities.

THE MORE, THE MERRIER!!

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Friday, 8/12

4:00 p.m. - Registration Table Open
 Free Time (see list of options)
 Dinner - On your own
 7:00 p.m. - Slide Show
"Orchids & Ferns of the Bruce"
 by Bob Hawes
 Snack

Sunday, 8/23

7:00 a.m. - Continental Breakfast
 8:30 a.m. - Safari III
 12:00 noon - Wrapup and Adieu

Saturday, 8/22

7:00 a.m. - Continental Breakfast*
 8:30 a.m. - Welcome / Orientation
 9:00 a.m. - Safari I
 12:30 p.m. - Catered Luncheon*
 2:00 p.m. - Safari II
 5:30 p.m. - Ohio Native Plant Society Meeting
 8:00 p.m. - Sharing at TWC
"Garland of the Generations"
 Slide Show

SEND TO: O.N.P.S.
The Wilderness Center, Inc.
Box 202
Wilmot, OH 44689-0202

OHIO NATURAL HERITAGE PROGRAM by Robert McCance, Jr.

Forty-three states now have natural heritage programs and the Ohio Natural Heritage Program (ONHP) is one of the oldest and most active. Created in 1976 by The Nature Conservancy (TNC) under contract with the Ohio Department of Natural Resources, Heritage has been the inventory section of the Division of Natural Areas and Preserves (DNAP) since 1977. Heritage has responsibility for rare species and natural plant community inventory and evaluation, and recommends natural areas, high quality plant communities and important rare species populations for protection. Data collected by Heritage is also used by researchers, consulting firms and governmental agencies, and this data is especially significant for environmental impact review where information on endangered and threatened species is required. Heritage provides one-stop shopping for rare species data required for environmental assessment.

The Heritage data base is the sole source of information for determining plant rarity status under the Ohio Endangered Plant Law. New localities for rare plants must be entered into the Heritage program data base before the information can alter the status of Ohio endangered and threatened plants. Field work conducted by Heritage staff may represent 75% of the new rare species information collected each year in Ohio.

Permanent staff consists of Bob McCance, program administrator; Allison Cusick, Jim Burns, and Marilyn Ortt, botanists; Dan Rice, zoologist; Patricia Jones, data manager; and data specialists Mary Ann Silagy and Vickie Hugo. Seasonal and college intern staff for 1987 consist of four plant community ecologists, three botanists, six birders, two malacologists and one data specialist.

Active projects for 1987 include the fifth year of the 5-year Ohio Breeding Bird Atlas; a state forest natural area inventory funded by the tax refund checkoff program; a contract with the Division of Reclamation for identification of areas in the coal-bearing portion of Ohio that should be declared unsuitable for strip mining because they are "fragile lands"; a Wayne National Forest research natural area and special interest area identification, evaluation and establishment report preparation project; and a statewide project to update and improve the location and population health data on Ohio's rarest plants. The Breeding Bird Atlas is an inventory of Ohio's breeding birds to determine distribution throughout the state, using randomly selected blocks consisting of 1/16 of a topo map in size.

Ohio's rare plant list data are widely regarded as among the best and most accurate in the midwest. Building upon the work of the Ohio Academy of Science, Ohio Biological Survey, and many individuals, Heritage has collected and evaluated literally thousands of plant occurrence records. The first official state list of rare plants was adopted in 1980. It identified 207 endangered, 210 threatened, 154 potentially threatened and 115 presumed extirpated plants. This list was revised in 1982, 1984 and in July 1986. The current list identifies 177 endangered, 173 threatened, 197 potentially threatened and 100 presumed extirpated plants. These numerical differ-

ences in the lists do not do justice to the tremendous number of nomenclatural, taxonomic and status changes that the species lists have undergone. While the endangered (E) and threatened (T) species list can be changed only through a public hearing/public review process, the potentially threatened (P) and presumed extirpated (X) lists can be modified as needed. As a result of 1986 field data, 27 "P" plants have been deleted from the inventory list because of the additional occurrences that were located, and five "X" plants have been relocated. Copies of the species list are available free from the Division of Natural Areas and Preserves.

In 1984, DNR published a 635 page book on the plants listed as endangered or threatened in 1984. Ohio Endangered and Threatened Vascular Plants: Abstracts of State-Listed Taxa described the 367 species on the 1984 list and provided much related information. This book is available from ODNR Publications Center (Fountain Square, Columbus, OH 43224) for \$10.00, plus sales' tax (\$0.55) and a \$2.00 shipping and handling charge. Allison Cusick is leading an effort to prepare abstracts on the presumed extirpated plants so that more people can be made aware of them and, hopefully, rediscover Ohio populations of these plants. Ohio's professional and amateur botanists and naturalists have been remarkably successful at locating Ohio's rarest plants, and additional information should aid in the search adventure.

The Heritage data base on 622 plants, 214 animals, 45 plant communities and 42 geologic features now (4/87) contains 9406 occurrence records. Data is kept in manual files, a computer data base and on 7.5 minute U.S.G.S. topographic maps. This system, designed by The Nature Conservancy, allows great flexibility and easy use of the data. Computer printouts can be obtained by species, area, topographic map, county and many other ways.

One of the most crucial efforts for protecting the entire range of Ohio's natural diversity is the classification, identification and evaluation of Ohio's natural plant communities. Plant communities contain all species, not just the ones we know and can classify. By protecting a full range of plant communities, we hopefully will protect a much more complete representation of Ohio's biological diversity than by single-species protection efforts alone. "Natural areas" may consist of several plant communities which can be classified and evaluated independently of the entire area. Proper attention to plant communities will help assure that our preservation efforts do not get locked into the selection of several examples of well-known or well-liked communities (such as hemlock gorges or bogs) before efforts are expended to protect the little-known or unattractive community types (such as shale glades or floodplain forests).

The Heritage plant community data system is not nearly as well developed as the plant or animal portions. Of the 9600 records, about 75% are plants, 17% animals, 4% communities, 2% geologic features and 2% other natural features. Plant community data is now being collected as part of the state forest evaluation project, the Wayne National Forest project and the "fragile lands" inventory in the coal-bearing region of Ohio. Limited work is also being done in the state nature preserves, many of which have not yet had community data collected in them.

Dr. Dennis M. Anderson, Heritage ecologist until August 1986, is writing a book on the plant communities of Ohio. Publication by the Ohio Biological Survey through the Ohio State University Press will occur in 1988 or '89. This publication will help Ohio biologists and naturalists to talk the same language when discussing plant communities and provide a format for classifying and evaluating natural plant communities. **Editor's Note: We will advise the membership as soon as book is available.**

By far the largest project undertaken by Heritage is the one funded by the Ohio Division of Reclamation as part of the state's administration and enforcement of the federal strip mine law. Started in August, 1982, this project has provided over \$700,000 to DNAP in the first four years. Heritage is now working on a county-by-county natural areas inventory of the 26 county region using Agricultural Stabilization and Conservation Service aerial photos and slides, combined with site evaluation of the better areas. Thus far, work has been completed in Muskingum, Belmont, Guernsey, Jefferson, Mahoning, Columbiana, Noble, Morgan, Perry and Gallia counties. In 1987, work is planned for Holmes, Tuscarawas, Monroe, Athens and Wayne counties. Concurrent with the county inventories that stress natural area and high quality plant community identification, Heritage is updating rare plant records and mollusk data, and searching for nesting occurrences of significant birds and additional rare plant data. If all goes well, the active inventory portion of this project will be finished in 1989. Heritage will then maintain this data base for use by the Division of Reclamation in evaluating mine permit applications and public petitions to declare land unsuitable for mining.

Heritage has been instrumental in the identification and nomination of potential research natural areas and special interest (natural) areas in Wayne National Forest. DNAP allocated tax refund checkoff money to an inventory of Wayne National Forest (WNF) in 1985, and the results of the work were reflected in the areas identified as natural areas in the draft WNF management plan distributed in October 1986. Additional areas studied in 1986 and 1987 should be recommended for protection in the final plan, due in late 1987. Heritage staff are also working on a contract with The Nature Conservancy and the Regional Office of the U.S. Forest Service to develop the detailed reports necessary for areas to be considered for Research Natural Area and Special Interest Area designation. Potentially WNF may add two research natural areas and seventeen special interest areas to the current one research natural area in the WNF. Jim Burns and Marilyn Ortt have also assisted in the identification of the plants which should be considered as sensitive species in WNF management activities. All told, we are very pleased with the concern that WNF staff have shown to natural areas and rare species in their management planning process, and we expect that WNF efforts will result in many new acres of land protected as natural areas.

Even though the Ohio list of endangered and threatened plants has dropped from 417 species in 1980 to 350 species in 1986, we still have the largest list of state protected plants, topping Illinois by three plants. In January, 1987, Heritage had

approximately 2500 records of these species. A review of this data in March showed that fully one-third of the records were inadequate for protection planning purposes. Either they were old (pre-1970), had locational data that would not lead a person to the site with any great confidence, or had little or no population size data. We could not select specific populations for protection efforts if we didn't know precisely where they were or whether the population could be presumed to be viable. With the 1987 field season we are initiating a three year effort to update the older records and all records of E & T species with vague location or population size data. This effort will significantly reduce our time to search for new populations, but it is critical for protection planning purposes. We have modified our data collection forms to stress better location and population size information, and we encourage anyone who finds a rare plant to spend whatever time is necessary to adequately assess the population size and presumed health, and to give very accurate and specific location information, including a map if at all possible.

Ohio Native Plant Society members and chapters can be especially helpful to our plant and plant community identification, evaluation and protection efforts. There never will be enough time for our staff to conduct surveys of sufficient thoroughness to locate all rare plant occurrences in Ohio. In fact, we are under stress just trying to keep the current data reasonably up to date. Our endangered and threatened plant book identified historical (pre-1960) records of rare plants that had no current equivalents in each county. Certainly many counties have indeed lost rare plants, but for much of this "lost" data, it is only lost because no one has had the time, knowledge and inclination to search for the plants. Some counties have large numbers of rare species previously known to occur there. The "leaders" (perhaps "losers" is more appropriate) are Erie with 75 missing species, Lake (69), Lorain (55), Ross (54), and Ashtabula, Franklin and Cuyahoga with 48. The big-city counties all show high numbers - Summit (42), Hamilton (42), Montgomery (34) and Lucas (30). We encourage your membership to organize regional searches for the rare plants previously attributed to each county. Many of these county records are there awaiting rediscovery. With the availability of the presumed extirpated plant abstracts, we shall encourage you to rediscover populations of these plants. We speculate that at least half of the 95 remaining presumed extirpated plants are out there awaiting rediscovery by someone with the interest and determination to search them out. We will gladly assist individuals and groups with whatever data we have that matches your geographic area and interests.

To close this article, I would like to quote the last paragraph of the Heritage executive summary, issued in September 1977. It is still accurate. "The final responsibility for the protection of our natural heritage rests with the people of Ohio. The Heritage Program and other natural area protection efforts must rely heavily upon lay public and professional involvement to continue inventory activities and protection efforts. The support of many Ohioans will be needed to assure that the most significant natural areas and the vulnerable species they support will be protected for generations to come."

Robert McCance is Chief of the Natural Heritage Program and one of the originators of the idea of the Ohio Native Plant Society.

The following two articles reflect two points of view about Meadow Gardening. The first one, by Eva Hoepfner, was critiqued by Brian Parsons, and we include his comments at the end. Brian's expertise in this area is demonstrated by his outstanding success at The Holden Arboretum.

The second article, by Donna Levy, reiterates some of the same facts, but also includes some ecological concerns that are very serious and about which rage much debate.

We hope that reading the articles will spur you on to considering meadow planting and will give you some helpful hints on how to do it.

TRIALS AND TRIUMPHS WITH THE NEWEST TREND IN GROUND COVERS

by Eva Hoepfner

Seed catalogues beckon you with glossy photographs of massed wildflowers: brilliant combinations of red, blue, yellow, orange and purple, like samples of old-fashioned cotton prints. At the garden center, shelves are stocked with cans, canvas bags, plastic sacks, even greeting cards of wildflower seeds, the containers so appealing that their contents hardly matter. Articles in popular magazines hint at low maintenance, no fertilizer or water costs, ecological health, the attraction of wildlife. One's head spins with visions of a gardener's paradise: gorgeous flowers waving among wispy grasses; birds, bees and butterflies darting through azure skies to nectar-laden blossoms, while the lucky gardener sits back with a long, cool drink, contentedly at one with a healthy, wonderful world. Can wildflower meadows be the answer to a gardener's dreams?

Well, the photographs don't lie, and the rumors are based on fact, but the truth is that a single meadow is unlikely to satisfy all your desires. A prairie meadow planted to native species requires little maintenance, for example, but only after years of thorough weeding. And native grasses and flowers may be in harmony with nature, but they never achieve a gaudy display. The commercial wildflower-seed mixtures, on the other hand, will provide a colorful explosion of flowers—enough to stop traffic on an eight-lane freeway—but some of the most photogenic examples have been planted on soil treated repeatedly with herbicides. The American Horticultural Society admits to spraying pesticides on its test plots every three or four years to destroy weeds, and then replants from scratch. Furthermore, the colorful splash of mainly exotic flowers usually lasts less than two years. So however appealing a wildflower meadow appears on first acquaintance, the concept is relatively untested as part of a well-tended landscape; and given the diverse climatic and soil conditions across the land, no single collection of wildflowers will suit all locales.

Of course, one must first define what one means by a wildflower meadow. Gardens and fields have been left to return to a natural state for as long as humankind has disturbed the soil, but the effect has more frequently suggested neglect than artful-

ness. Then again, a wildflower to one person may be a noxious invader to the neighboring farmer, and a wildflower to your seed company may be grass to you.

Gardeners have long squabbled over what wildflowers are. Purists insist that they are native plants that grew before the arrival of the Europeans. Others include naturalized plants in the classification—those introduced from other parts of the world and that reproduce freely in their nonnative habitat. Opinion these days favors the definition that includes both native and naturalized plants. Weeds, incidentally, are just wildflowers that grow where they are not wanted. Noxious weeds are plants that the authorities have determined threaten human health or agricultural practices. Some common attractive weeds are Queen Anne's lace (*Daucus carota*), chicory (*Cichorium intybus*) and even oxeye daisy (*Chrysanthemum leucanthemum*).

The definition of "meadow" is also blurry. Some define it as a grassland occurring in areas of high rainfall, in contrast to a "prairie," which occurs in areas of low rainfall; others say a meadow is a grassy spot found in a forested region. For our purposes, a meadow is a mixture of grasses and flowers growing in a sunny, open area.

As for appearance, one person's cherub is another's gnome. A meadow might inspire nostalgia or conservational righteousness, but it can equally incite your tidy neighbor to organize a vigilante mower brigade. Many lawsuits attest to differences in perspectives. None other than Rodale Press, publisher of **Organic Gardening** magazine, was hauled to court in Emmaus, Pennsylvania, when parts of the once-manicured lawn around its headquarters were left to grow undisturbed. Stephen Kenney, an ecologist in Kenmore, New York, was convicted of contravening the local lawn ordinance and fined \$50 for each day his meadow remained unmowed. Meanwhile, his neighbors, who cut down Kenney's meadow when he was out, were absolved of wrongdoing. Kenney ended up moving to less hostile territory. It might be noted, however, that in the great majority of lawsuits, meadow advocates are winning their cases. In Wisconsin, wildlife biologist Donald Hagar defended his unmown meadow by proving it was not a fire hazard, health hazard or rat haven. And in Milwaukee, Lorrie Otto successfully sued the city for damages when it mowed her meadow without her permission.



Viola pedata L. Bird's-foot

The problems of naturalizing wildflowers are illustrated by the case of a developer near Toronto who agreed to turn parts of a new housing development into wildflower meadows a few years ago. The object was to reduce maintenance and to make the buildings blend in with the natural parkland that weaves throughout the development.

The town was enthusiastic, as were a good many local residents. A wildflower-and-grass seed mixture was planted, but the exotic grasses in the mix greatly outnumbered the flowers such as clover and yellow trefoil. The result was not what many expected.

The following year, a different wildflower mix was seeded into the existing meadow. The new mix contained mainly exotic annuals, with some perennials thrown in. The first year, most people were pleased with the results: a profusion of familiar garden flowers such as Shasta daisies, baby's breath, phlox and bachelor's buttons mixed with naturalized plants such as toadflax and yarrow. Only a few critics were heard to grumble, "You call these wildflowers?" The second season, ragweed, burdock, thistles and poison ivy made a strong show, and complaints were heard all the way to the Parks Board. Few annuals had reseeded, and the ornamental perennials that had taken root were in a life-and-death struggle with the unwelcome invaders. Some residents decided to take matters into their own hands, and their mowers roared into action. The fate of the project is still uncertain, but the landscape contractor who planted the meadows swears he will never plant another.

This example is not meant to discourage wildflower enthusiasts, but to point out that often too much is expected, too soon, with too little research and labor. Before you attempt to sow a wildflower meadow, know exactly what effect you want, exactly what the seed company is selling you, and how the meadow might be greeted by your neighbors and your weed inspector. Walk ever so slowly—don't run—for a can, or whatever, of seed. If you are uninformed, you might not get what you bargained for.

Ecological Parade

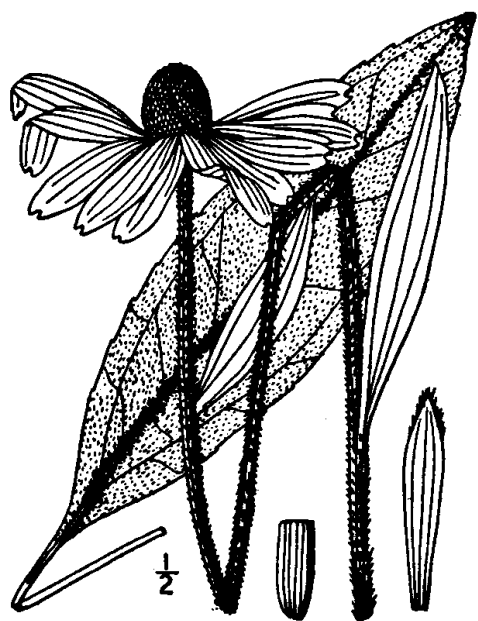
For successful meadow gardening, it is important to understand natural processes. Most natural meadows are temporary stages in the ecological parade of succession. A bare field, left to its own devices, is soon invaded by grasses and forbs (nonwoody, broadleaved plants such as dandelions and plantain). This is the meadow stage. Soon shrubs and other woody seedlings will enter, and over the next 50 to 150 years, the field will reach its climax stage, the forest. If you want a meadow to remain a meadow, you must intervene by weeding out woody seedlings or by regularly mowing or burning it.

Sometimes, depending upon climate, soil, moisture and on other factors, like available seed and the presence of fire or grazing animals, the meadow stage becomes the climax. In North America, these natural grasslands are found on the prairies (**prairie** is French for "meadow"). The indigenous plants form a community, a stable collection of diverse species that have evolved over the ages to adapt to the particular conditions of the area. They depend on each other for survival, tall plants sheltering short ones from sun and wind, ground-hugging plants protecting the soil from erosion, and all manner of organic litter enriching the soil. The community is a complex interaction of plants, insects and soil organisms, and it plays host to abundant wild-life. A meadow that comes closest to simulating the natural plant community of your region will require the least maintenance.

If you are looking for carefree summer days and you don't care much how your meadow looks, the simplest choice is to let the lawn grow. Be forewarned that, for a long time, this kind of meadow will look like an abandoned field, which some folks might call unkempt. It will yield a good crop of weeds: dandelions, quack grass, burdock, thistles and teasel are common invaders. But depending on how close you are to wildflower seed sources, you might also be pleasantly surprised.

Alice Hayek of Cobourg, Ontario, reduced her lawn mowing to a winding path, and received her share of weeds. But since the property lies in a rural area, it took only two years for the lawn to transform itself into a small meadow of black-eyed Susans, sunflowers, goldenrod, milkweed, asters, pink fleabane, butter-and-eggs, wild strawberries and violets. Gardeners who are not as fortunate can introduce mature wildflower plants, but the plants will face fierce competition from the naturalized forbs and grasses. An annual mowing to about 6 inches with a string trimmer (or sickle-bar mower for large areas) will keep woody species in check.

But many of us don't plant a meadow to avoid work; for some it is a matter of principle. Planting a meadow of only native species can satisfy conservationists as well as those in search of a low-maintenance landscape. The only problem is that it takes a lot of time and effort to keep the weeds at bay until the native plant community is secure. Larry Lamb, an ecology technician at the University of Waterloo, Ontario, labored for four years to establish pathways, prepare seedbeds, introduce plants and seeds, propagate rare species and weed his backyard prairie garden. Setting a fire each spring has helped reduce weeds, and now that the native plants have knit into a tight little community, overseeing the burn is about all the work that remains.



Lamb's low-maintenance miniature prairie looks nothing like an abandoned field. In winter, russet grasses and seed heads lace the snow; during the rest of the year, wave after wave of more than 200 species mark the passing seasons: "During the growing season," Lamb says, "an average of two species start blooming every day." Short flowers such as purple pasque-flowers, bird's-foot violets and shooting stars emerge in spring, followed by taller golden alexanders, purple bergamot and fiery butterfly weed. By midsummer, turk's-cap lily and blazing star edge up, to be topped by giant prairie dock and sunflowers. Goldfinches, meadowlarks, hummingbirds and butterflies flit through grasses that range from knee-high to 10 feet tall.

Rudbeckia hirta L. Black Eyed Susan.

Lamb lives on the outer edges of what

was formerly natural prairie. "However," he says, "you can grow prairie plants where there never was prairie. And if prairie plants are unsuited to the area, just plant those species native to the region—check your field guides—and fight the woody stuff. Natural grassland occurs anywhere you go."

Native Meadows

Prairie gardeners agree that one cannot re-create the feel of a sweeping prairie on less than an acre. You can, however, plant any sunny, well-drained spot with native plants. In fact, it is advisable to start small—with a former perennial border, for example, or a corner of the lawn—and increase the meadow once you find out what grows well. Meadows look especially pleasant set off by a solid background such as a wall, a fence or shrubbery. For visual interest, take advantage of land contours, perhaps creating a slope and adding a few shrubs, rocks or a bench. Paths add shape, invite closer scrutiny of wildflowers and promote weeding.

Make sure the area gets at least five hours of sun a day; less than that will result in spindly growth and little bloom. The soil should be neutral or slightly alkaline. It must be well drained and not too rich if you want blossoms instead of leaves and grasses. Add organic matter to heavy soils. If you are replacing a lawn, remove and compost the sod (sod cutters are a great help). Don't plow it under unless you plan to smother the area with plastic or thick layers of newspaper for at least a year. In fall or spring, till the area to a depth of 4 or more inches. Try to remove all vestiges of lawn grasses, for each little rhizome that stays in the soil can generate a large grassy patch that will be extremely difficult to remove once the area is seeded to wildflowers.

Weeds are the prime enemies of meadows. Before you seed, cover the prepared area with black plastic for at least three months to induce weed germination and subsequent smothering. If you are a patient gardener, fallow the soil for a growing season: rake shallowly, water to encourage weeds, then cultivate; repeat several times to encourage as many weeds as possible to germinate. Before seeding, rake, just barely scratching the soil so as not to bring other weed seeds to the surface.

Plants can be introduced by seed or as mature specimens. The cheapest way is to use all seed, but you will have to wait at least a couple of years for the perennials to start blooming. Mature plants will give structure to the meadow and achieve earlier bloom, but they are expensive. Never dig native plants from the wild. Some species are protected by law. Even if the plant is not endangered, you could be taking it from a part of its range where it is scarce. Combine a few plants with seeds for results that are both inexpensive and fast. Illinois ecologist Robert Betz, who has restored more than 300 acres of prairie, believes that aggressive native plants—goldenrod, asters and sunflowers—should be introduced first to overcome foreign weeds. This creates a more amenable prairie environment for the delicate plants, which can coexist with aggressive natives but not with foreign weeds such as dandelions and burdock.

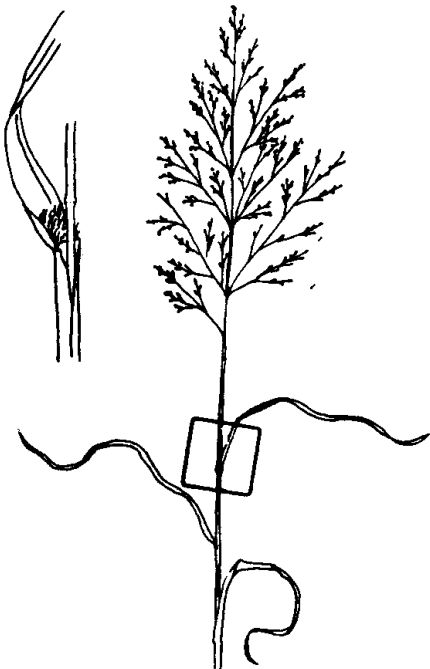
The first year, a native meadow can be discouraging. No matter how diligent you've been, some weeds will defy your efforts. And while the weeds are flourishing, your seeded species will stubbornly resist fleshing out. This is because prairie plants first develop strong root systems, as much as 20 feet deep, to protect against a harsh climate. Nature also staggers some seed germination over a period of years. Don't give up. The second year should see a lot of grasses and some flowers in bloom. If you continue to weed (know your weeds!), you will be amply rewarded by the fourth year.

In nature, prairie grasses undergo occasional burning, a process that kills alien plants, warms the soil, adds nutrients in the form of ash, and removes thatch that could eventually choke smaller plants. Larry Lamb is fortunate to live in an area where he can burn his meadow, which he has planted in areas divided from one another by 4-inch-deep gravel paths that act as firebreaks. In most situations, however, burning one's yard is dangerous and illegal. If you can't burn, mow to 6 inches every spring with a string trimmer, scythe or sickle bar, then compost the clippings.

Exotic Meadows

Conservation is well and good, but the prevalence of exotic wildflower seeds in stores and catalogues shows there are other reasons for wanting a meadow. I spent my childhood in rural Germany, and nothing turns me to homesick jelly faster than a reproduction of Monet's poppy fields.

There is nothing wrong with indulging yourself in a passion for foreign flowers, but be aware, nostalgic gardeners, that a meadow from a commercial mix will rarely resemble one from your childhood. One popular seed mixture contains lots of corn poppies and cornflowers—the mainstays of my favorite meadow—but along with these is a crowd of unrelated species: yellow coreopsis, evening primroses and blackeyed Susans, orange Siberian wallflowers, purple loosestrife, pink Mediterranean dame's-rocket, red North African flax and more. Missing are the wispy grasses that formed the background of my childhood meadow. The gaudy display from the seed packet is a far cry from what I remember as a harmonious blaze of golden stalks and scarlet blossoms.



Switchgrass (*Panicum virgatum*).

No seed mixture, of course, can satisfy everyone. Many people want spectacular color—all the time and quickly. Hence, most commercial mixes strive for a maximum variety of hues throughout the season and include lots of annuals that will bloom the first year. The inclusion of flowers that tolerate various

growing conditions is supposed to ensure that at least something will grow everywhere. Not all species are expected to flourish, and few will over any length of time. While some dwindle, others may take over, and this can create unforeseen problems.

The trouble with introducing alien species into a region is that you never know how they will react. They can succumb to the climate, can naturalize in a quiet, reserved manner, or they can take over the land. Many of our common weeds—dandelions, Queen Anne's lace and chicory, for example—were introduced from Europe or Asia. Purple loosestrife (*Lythrum salicaria*), imported from Europe as an ornamental, is becoming a serious pest in various regions, yet it is still included in many wildflower seed mixes. We should also heed the warnings from foreign gardeners. Those scarlet corn poppies, for example, are said to be the bane of every European farmer. What if they love their new environment in the prairie wheat fields too?

Even if an introduced alien doesn't ravage the countryside, it might crowd out other desirable species within your own meadow. Often, this means replanting your meadow from scratch, and having gone to all that trouble once, you might be reluctant to repeat the process.

Before buying seed, make sure the mixture lists the species by name. Check in a reliable reference book for potential troublemakers. These include lawn grasses, which are sometimes used as filler but will quickly choke out many flowers. (Prairie grasses, on the other hand, "are not really sod forming—there are openings for forbs to take hold," says Larry Lamb, who recommends the use of ornamental native grasses in a prairie meadow in a proportion of 50:50 to 80:50 with forbs.) For hardiness and longevity, select a mix with a mainstay of locally hardy perennials, and remember that the strength of a meadow lies in diversity: the more species you try, the better your chance of success. Start with a small area, a flower bed, for example, and study the effect before seeding large areas.

Directions for planting a commercial mix are like those for planting a native meadow. The secret is starting with a clean seedbed. Unless you want to spray the area two or three times with a nonselective herbicide such as Roundup, which kills all green plants on contact, you will have to cultivate repeatedly or apply black plastic for a year. Once the meadow is established, mow it in late summer or winter to help disperse seeds and open the area to light. (Do not burn after early spring, or you will kill most of the plants.) Reseed patchy places every couple of years—every year for continuous bloom—and keep weeding. Some people start from scratch every three or four years.

Commercial seed mixtures can be a good introduction to meadow gardening. They can supply many species you might not have considered; they let you become familiar with the attendant pleasures and problems. But don't be afraid to experiment. Lighten up a flower mix with noninvasive grasses; temper an all-native mixture with well-mannered, naturalized flowers. Add a profusion of spring bulbs for early bloom. If you are cramped for space, forget the seeds and create the essence of a meadow

with a tidy little patch of perennial flowers and clumped grasses, each plant as carefully placed as in a perennial border.

There is one more thing. In **The Wild Gardener**, published in 1894, William Robinson asked, "Who would not rather see the saving grass with countless flowers, than a close surface without a blossom." Well, your neighbors might not. Tell them of your plans, show them that you work hard (at least initially) and keep your edges trim; share your delights and disappointments. Who knows, you might just win them over to this new gardening adventure.

Eva Hoepfner is a freelance writer specializing in gardening topics.

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COMMENTS by Brian Parsons

In the glut of popular literature and advertising that is promoting Meadow Gardening as the greatest thing since sliced bread, I welcome a realistic presentation of the information such as offered by Eva Hoepfner. The author's presentation is much more realistic than the popular tripe that surrounds the subject and correctly points out many of the short comings of the commercially available seed mixes and associated literature. Contrary to the popular conception of just adding seed and standing back, most people would have more success planting marigolds or petunias.

The author correctly points out the limitations of many of the regionally designed seed mixes as they largely contain annuals and biennials and are neglectfully short with perennials. Often the species listed as wildflowers are neither native or desirable. I could not agree more with the author's advice to study local plant communities and field guides when it comes to choosing those species one would like to include in their plantings, as this is a basic premise when it comes to any natural landscaping. One should go further than just studying species composition in determining which species to grow and attempt to understand the cultural components of the habitat and determine if the reconstruction is feasible. The author lists June Grass as a common ingredient of wildflower mixes and it indeed grows in Ohio. However the species requires sandy soils and in Northeast Ohio that is a precious commodity that dooms the species chance for survival before the seed is cast.

The author also correctly points out a major problem with Meadow Gardening that many fail to consider, which is the weed seed bank in the soil. The sudden exposure of weed seed to the light can result in more weeds than wildflowers and can defeat a planting from the start. The author's recommendation to cover the prepared site with black plastic for one year prior to sowing with seed, however effective, is not as practical as an application of a non selective herbicide such as Round Up.

The practice of plowing, repeat discing, and herbicide is routine among those Midwest landscapers who install prairie on a large scale commercial basis, prior to seeding areas into prairie.

Further points that I heartily agree with are the author's recommendations to combine established plants and seed in the development of a meadow; and the simplest approach of minimal mowing. Mowing once a year to keep out woody invaders will result in successful meadows for many of us, and if supplemented with established plants purchased from reputable nurseries which **propagate their own stock** should provide far superior results than one could achieve with any commercial seed mix. The use of established plants allows the selection and placement of desired species and will provide early color when combined with seed, thus eliminating the need for many annuals in the seed mix.

However skeptical my comments may appear I do feel that Meadow Gardening has potential for Northeast Ohio, but that there remains a lot of unknowns at this point. Eva Hoepfner points out some of the traps easily fallen into by the novice. Interested parties should visit Brecksville Metro Park, The Cleveland Museum of Natural History, and The Holden Arboretum and explore their plantings prior to planting any Meadow Gardens on their own. With a little research and careful preparation the rewards will outweigh the hard work.

* * * * *

MEADOW GARDENING by Donna Levy

In recent years the cultivation of wildflower meadows has been of burgeoning interest in the Northeast. Attractive photographs of fields with colorful wildflowers seen in magazines and catalogs, combined with the misconception that meadow gardening is maintenance free, have probably contributed to its growing popularity. Now many seed companies are promoting that approach to gardening and are flooding the market with "meadow mixes."

Meadow gardening is in its infancy in the Northeast. There is much to be learned about it, and there may be some ecological concerns related to it. Successful meadow gardening is dependent on understanding the nature of meadows and learning what is involved in creating one. It is helpful if the gardener has a basic understanding of plant succession: a natural process whereby one assemblage of plants is replaced by another until a climax situation is reached. Climax situations are capable of sustaining themselves. For example, in the Northeast, woodlands dominated by red oaks, black oaks, and white oaks, constitute a climax condition.

Next, it is necessary to understand what a meadow is and where one occurs. A natural meadow is a perpetual grassland—a habitat of rolling or flat terrain where grasses predominate. Natural grasslands are climax ecosystems maintained by environmental factors that restrict the growth of woody plants. For instance, alpine meadows occur at high elevations and are maintained by harsh climatic conditions. Coastal meadows are maintained by salt sprays, and desert meadows by low precipitation. Prairies, the grasslands found on the continental

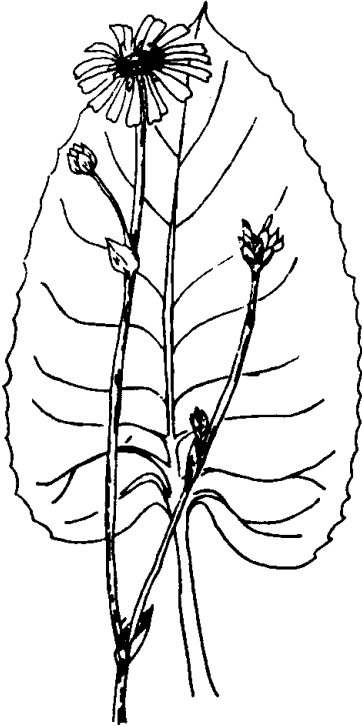
plains of the **Midwest** and the West in North America, are maintained by periods of severe drought and are subject to fires.

What we often refer to as a meadow is more likely an old field that is in a state of early succession and destined to become woods again if left undisturbed. After farmland has been abandoned, grasses and other herbaceous plants will colonize its fields. The condition is only temporary, however, because the early colonizers will be shaded out when woody plants invade. Such sites must be intentionally kept in that state to maintain the meadow community.

In the Northeast the plants growing in disturbed sites are chiefly non-native. Such sites contain many Old World species that were inadvertently brought to this country in ship ballasts and livestock bedding, or that were intentionally imported for use in gardens or research projects. Those that escaped and were able to compete successfully with native species were naturalized and became what we loosely call wildflowers.

Many companies offer assortments of wildflower seeds, but be forewarned that your success with mixtures will depend somewhat on your careful evaluation of them. Beware of the pretty picture on the packet or the can and the enticing name of this mix. The picture may be the most attractive thing offered.

Most mixes contain combinations of seeds from midwestern and western native wildflowers, as well as seeds from exotic wildflowers (species from foreign countries). Some mixes contain seeds of species already naturalized in our part of the country, but relatively few mixes contain species native to the Northeast. Mixes often have seeds of both annual and perennial plants.



PRAIRIE DOCK
(*Silphium terebinthinaceum*)

Some commercial mixes include potentially invasive or noxious weeds. For example, companies may incorporate seeds of purple loosestrife (*Lythrum salicaria*) in their mixes. Although it is very attractive, purple loosestrife should be avoided at all costs. It has become an environmental pest and is posing a real threat to native wetland habitats. It is now found growing invasively through valuable wetlands in the Northeast and has moved into the Midwest and parts of Canada. The plant outcompetes wetland species that are beneficial to wildlife, such as rushes, sedges, cattails, and smartweeds. Purple loosestrife is not a food source for most wildlife, and its stems and roots trap debris over a period of time, slowly raising the surrounding ground level. Three years ago it was estimated that purple loosestrife had successfully invaded

over one thousand acres of the Montezuma marshland refuge at the north end of Cayuga Lake. The plant was first recorded as being sparse there in 1951, but within five years an estimated equivalent of one acre of purple loosestrife was growing there.

The New England Wild Flower Society has compared mixes from twenty-one of the companies that offer wildflowers seeds and has compiled a very helpful chart. The chart lists the companies, the name of the mixes they offer, the number of species in each mix, and the percentage of species native to the Northeast in each mix. Comments are included as well. To obtain a chart, write to the New England Wild Flower Society, Hemenway Road, Framingham, MA 01701.

SOME PREDICTIONS

Assume you sow a wildflower-seed mix in a tilled area and perform no other cultural practices such as weeding or watering. If that mix contains exotic annual species, the following is likely to happen: the first year, the annuals will bloom, making an impressive show, but the plants will probably disappear by the next season. Very few, if any, will self-sow. If that mix consists of commonly naturalized wildflowers along with other wildflowers, the naturalized wildflowers that have already proven themselves tough in the area probably will out-compete the less aggressive types. Finally, if that mix doesn't contain species already naturalized in the area, they they probably will invade anyway, since tilling the field will have created an optimum condition for the growth of common weeds (naturalized wildflowers.) You are most likely to succeed with mixes that contain native species, such as goldenrods and asters, and already naturalized species, such as chicory and black-eyed susans. That being the case, you might wonder why you should sow anything at all after tilling.

SUGGESTED APPROACHES

If you are interested in experimenting with meadow mixes, here are some general pointers. First, consider that you must approach the effort as you would any gardening venture. Scattering seeds over a weedy field will not produce an ornamental meadow. Success is most likely if you choose a small area, one that you can weed and tend easily while your meadow is establishing itself. The soil should be tilled and smoothed out as it would be for a planting bed. Tilling, however, is likely to bring to the surface many weed seeds that have lain dormant. Many a meadow gardening attempt has failed when the weeds triumphed, so be prepared with a plan for weed control.

Choose a mix most suitable for your site: consider soil, moisture, available light, preferred season of bloom, plant heights, and your geographical region. Seeds can be sown in spring or fall. Fall sowing is often recommended because weeds may be less of a problem at that time of the year, and seeds requiring a period of cold before they germinate would have their requirement met during the winter. Annual mixes can be sown in the spring but that means tilling and sowing seeds every year to maintain the meadow. Once your seeds have been sown, keep them moist so that they can germinate. And after the wildflowers have germinated, remember that moisture will be necessary so that the new plants can establish themselves.

Learn to recognize the seedlings you want to encourage, so that you can weed the plot. You will probably need to keep up with the weeds for the next two or three years.

When established, the meadow should be cut once a year in the spring for uniformity and to discourage the growth of woody plants. Some wildflower gardeners recommend fall cutting, too, but not until after the plants have matured their seed, to ensure that there will be a source of new seeds. Cut the meadow high by hand with a scythe. A lawn mower cannot be set high enough for the job.

Now, stop to consider whether you have the time, resources, and enthusiasm to do all that on a large scale. For more detailed information I recommend an article entitled "The Return of the Wildflowers," published in the April-May 1984 issue of Flower and Garden. Another excellent reference recently off the press is a book by Laura C. Martin entitled The Wildflower Meadow Book.

An alternative would be to try something akin to an experiment being conducted by the New England Wild Flower Society at Garden in the Woods. Their method, too, is labor intensive, and you will find that the more elaborate the meadow is, the more demanding the kind of gardening required. For their project, after preparing the site, the New England Wild Flower Society introduced three thousand nursery-grown plants into a quarter acre. They had selected thirty species of competitive wildflowers that are native or naturalized in the northeastern part of the country. Then they sowed native grass seed at two times the recommended rate. Grasses were used because they are an integral component of natural meadows and will aid in weed control.



PURPLE BERGAMOT
(*Monarda fistulosa*)

Another approach resulting in a somewhat different effect is what we have done in the Mundy Wildflower Garden at the Cornell Plantations. By mowing it annually we intentionally keep the meadow in the temporary state of early succession I referred to earlier. A few years ago we removed all the woody species that had started to invade the site. The area was tilled, and we planted a modest number of native plant seedlings that thrive in full sun. Then we just sat back and let nature take over. Today, although some natives persist, it is a good place to see and study the kinds of non-native wildflowers that have become naturalized along roadsides and in old fields in our area.

Last summer we ran some small test plots, sowing four different mixes from one company. In June we prepared the four ten-by-fifteen-foot beds and sowed

three-quarters of an ounce of seed on each. The plots were weeded by hand once in August, just about the same time the first blooms appeared. The blooming plants were annuals and were either exotic or western wildflowers. I'm curious to see what happens this coming season. My guess is that the annuals will not persist, and it will be interesting to see what becomes of the perennials in those mixes.

SOME ECOLOGICAL CONCERNS

Some seed companies pride themselves on offering seeds collected in the wild by professionals. Plants that produce abundant seeds may not be endangered by that activity, but I wonder whether the seed collectors' activities will deplete the seed sources of some species of prairie plants. Today less than one percent of our nation's prairies exist in their natural state. Instead wheat and corn fields occupy that ground. If seeds sold in meadow mixes don't naturalize, then we aren't perpetuating or preserving the species. Will we be noticing a detrimental impact on the natural populations years from now?

I am also concerned about the potential consequences on native flora of introduced wildflowers. If, for example, we introduce species of goldenrods or asters that are not native to an area, is there a chance they will out-compete the native species? I suspect that even if the seeds of regional species are included in the mixes sowed in the region, the seeds are likely to be different varietal forms, and I'm curious about whether the introduction of geographic strains from another region will have an adverse effect on local varieties of native plants. Is there a potential for disturbing the natural balance of our wild flora once the interactions of pests, diseases, and other environmental pressures come into play?

I don't want to discourage determined gardeners from trying a wildflower meadow if they are prepared for the work it entails. Following one of the three approaches I have discussed should ensure success. Keep in mind that commercial seed mixtures should be used only in a plot small enough to be cultivated, and that on a large scale, only species sure to naturalize should be used. Your final option is to till up the ground every year and sow annuals.

Donna Levy is the gardener in charge of the Mundy Wildflower Garden at the Cornell Plantations. The above article is reprinted from Cornell Plantations, Vol. 42, No. 2 and The Bulletin of the Virginia Wildflower Preservation Society, Vol 6, No. 2.

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Common Ingredients of Wildflower Mixes

NATIVE NORTH AMERICAN WILDFLOWERS

Beebalm; bergamot; lemon mint
(*Monarda* spp.)
Black-eyed Susan (*Rudbeckia hirta*)
Blanketflower (*Gaillardia aristata*)
Blue flax (*Linum lewisii*)
Butterfly weed (*Asclepias tuberosa*)
Coreopsis (*Coreopsis lanceolata*)
Common milkweed (*Asclepias syriaca*)
Goldenrod (*Solidago canadensis*)
New England aster (*Aster novae-angliae*)
Purple coneflower (*Echinacea purpurea*)

EUROPEAN & ASIAN WILDFLOWERS

Cornflower (*Centaurea cyanus*)
Chicory (*Cichorium intybus*)
Baby's breath (*Gypsophila muralis*)
Foxglove (*Digitalis purpurea*)
Corn poppy (*Papaver rhoeas*)
Purple loosestrife (*Lythrum salicaria*)
Oxeye Daisy (*Chrysanthemum
leucanthemum*)
Queen Anne's lace (*Daucus carota*)
Toadflax (*Linaria* spp.)
Wallflower (*Cheiranthus allionii*)
Yarrow (*Achillea millefolium*)

SOD-FORMING GRASSES

Bent grass (*Agrostis palustris*)
Creeping red fescue (*Festuca
rubra rubra*)
Kentucky bluegrass (*Poa pratensis*)
Red top (*Agrostis alba*)

NONAGGRESSIVE GRASSES

Blue-joint grass (*Calamagrostis
canadensis*)
Big bluestem (*Andropogon gerardii*)
Canada wild rye (*Elymus canadensis*)
June-grass (*Koeleria cristata*)
Little bluestem (*Andropogon scoparius*)
Prairie dropseed (*Sporobolus heterolepis*)
Sideoats grama (*Bouteloua curtipendula*)

At Dr. Macior's April lecture for NPS, he mentioned some references that would be helpful to those wishing to learn more about the subject. Herewith is the bibliography he submitted.

* * * * *

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Professor of Biology, University of Akron

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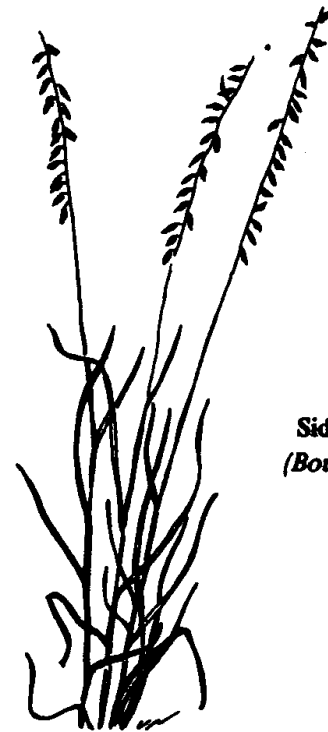
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Asclepias incarnata L. Swamp Milkweed.



Sideoats grama
(*Bouteloua curtipendula*).

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Prairie Nursery

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Clyde Robin Seed Co.

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Siskiyou Rare Plant Nursery

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Valley Creek

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Vermont Wildflower Farm

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We-Du Nurseries

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Southeastern native plants. Catalog 50 cents.

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Wild Seed

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seeds and mixes. Catalog free.

Woodlanders, Inc.

1128 Colleton Ave.
Aiken, SC 29801
Herbaceous and woody perennial plants.
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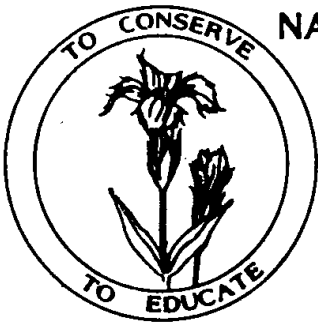
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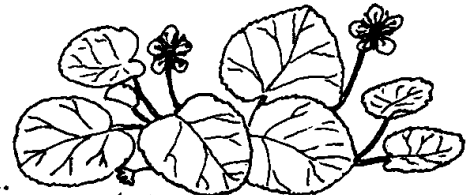
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