

SEEDS OF DIVERSITY



Photo by Susan Clark

Iowa Department of Natural Resources Prairie Resource Unit

June 2007

Tips on Reconstructing a Prairie

Bright and beautiful native grasses and wildflowers blowing in the wind, a dicksissel perched on a compass plant, or a German shorthair on point in a clump of Prairie cord grass. These are the thoughts or dreams that many of us have before we start a prairie reconstruction. What does it take to get an area established with native grasses and wildflowers? Prairie reconstruction has 3 major steps in the process: ground preparation, seeding, and maintenance. Each step has several different methods that can end in a well-established reconstruction.

Ground preparation is the first key to good prairie establishment. Cropping an area so that it is in soybeans is one of the easier methods to prepare the ground. Soybeans are nice because there is very little residue for the newly planted seedlings to penetrate. Sometimes it is not practical or possible to have an area cropped, so are there other ways to prepare the ground? Yes. Burning down an area with Glyphosate works with some success, but sometimes takes a couple of applications. Also, if the area has been in alfalfa-brome or other nonnative mixes, there will be some dormant seed left in the soil that will germinate after the area has been sprayed with Glyphosate initially. Pocket gophers also are a problem in many old hay seedings. Many of the areas are very rough making spray application and seeding a difficult experience. A solution may be to do some light tillage to an area followed by an herbicide application. The tillage will inspire additional germination of weed seeds and nonnative grass seed that are established on the area. Wait two weeks after tillage has taken place and apply a dose of Glyphosate. Also, be sure and cultipack or roll the site to give it a firm, even seed bed before planting. With multiple trips across the field it is easy to see why soybean stubble is preferred.

Seeding is the second step in the process of well-established prairie reconstruction. Common seeding methods include drill or broadcast seed-



Native grass drill-photo Saylorville staff

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ing. Broadcast seeding is acceptable when seeding dormant between November and March. If the ground is in bean stubble, the frost action will take the seed to proper depth for germination. Broadcast seeders are more difficult to calibrate and get an even amount of seed across the field, but are faster to cover large areas. Drills are better at delivering seed at an even rate, but can also plant seeds at different depths when different soil conditions are prevalent. This is a negative for wildflowers. Many wildflower species have seed that is the size of a grain of salt or smaller. One-fourth inch or more seeding depth is too great for the small seeds to emerge. Seeding time and seeding methods are the factors that can be altered when completing a prairie reconstruction. Seeding time options include spring, summer, and dormant (November through March). Wildflowers benefit from dormant-type seeding method because cold, wet conditions break down the seed coat or dormancy of seed. Spring seeding April through June benefits warm season grasses. This is also a negative for wildflowers. Many seeds will not germinate for a year because of the dormancy in the seed. This gives the warm season grasses a head start allowing them to dominate the reconstruction.

Maintenance of the newly planted seeding is one of the keys to success of prairie reconstruction.

Mowing the area for the first year is critical to success of newly emerging seedlings. Mowing allows sunlight to penetrate down to the small seedlings which is critical for their vigor and future survival. How many times should I mow the new reconstruction? A good rule of thumb is when vegetation gets one foot tall, mow the area back to a 4-6 inch height. This can be a bi-weekly process in June or July if there is warm weather with a good amount of rainfall. Watch out for wind rowing of plant material when you mow. If you wait too long to mow, many mowers will form a wind row of cut plant material suffocating newly emerging seedlings. Later, in August when Iowa tends to get drier, mowing tends to slow down also. Mowing the second year is recommended if the reconstruction included a grass and wildflower mix and was planted in the late spring. This allows for seed that laid dormant the first year to catch up with warm season grasses that emerged in year one. It also will weaken root systems of native grasses reducing their vigor.



1 year old reconstruction August 2006



Photo by MJ Hatfield

Guaranteed success is not in the vocabulary of anyone who has done a prairie reconstruction. In other words, I have learned by making a lot of mistakes in the past. Improving success rate can save a lot of time and effort in the field. Following the tips above should improve your success and help you on your way enjoying your own reconstructed prairie dream for many years to come.

Secrets of Prairie Seed Production Revealed

Ever wonder what it takes to produce a prairie wildflower seed? What kind of a process is involved? For some species it is somewhat simple, but for others it is a journey. I will unveil a few of the strategies that the Prairie Resource Unit uses or has had difficulties dealing with seed production of native wildflowers.

Seed collection problems. Black-eyed Susan is an annual prairie species that fairly easily produces seed. Problem: Where are the Black-eyed Susans on a preserve? State preserves are seed sources for most of our seed production. They tend to be very stable in their management; therefore, many of the disturbance species such as Black-eyed Susan are not very common. Once the seed is found, germination is somewhat easy--place seed in a germination tray, wait a couple of weeks and Black-eyed Susans abound. Black-eyed Susan is an annual; therefore, seedlings need to be produced in a greenhouse yearly. Seed multiplication is immense with a small handful of seed easily turning into several pounds of seed in a year's time.



Pest issues in seed production. Prairie blazing star is a perennial species that is sought after in many reconstructions. Seed is plentiful in most preserves, so seed collection is not an issue with this species. Germination is done by stratifying the seed for 90 days. This means after harvest of the seed it needs to be mixed with 2 parts sand to 1 part seed in a baggie with water added to the mixture, then placed in a refrigerator for 90 days. Once stratification is done, it is time to germinate. One other trick we learned along the way is to remove the feathery tuft from the seed to give it better seed-to-soil contact. Once germinated and the seedling has produced its first set of true leaves, individual plants are hand-transplanted into 72-cell trays. In about 2.5 months there will be a seedling 4-6 inches tall ready for transplant. Planting in the production plot is done with

a dibble stick and a lot of bending and watering. A crew of 12 guys can plant 1000 or more plants in a couple of hours. Watch out! Prairie blazing star has a corm or bulb that is delicious to 13-lined ground squirrels. We found out the hard way. After planting 1500 or more at our Brushy Creek plot in May or 2002, a week later 50 or less survived. Two weeks later we had less than 10 individual plants remaining. Wait another year, collect more seed, and grow plants in the greenhouse. Oops! Seed had low viability, and only 200 additional plants produced. Finally, in 2004 we collected enough seed to grow plants in the greenhouse and finally refill the holes vacated by the eaten Prairie blazing stars. Seed production can occur in as little as 2 years with prairie blazing star, but year 3 is when a significant amount of seed is produced. Another problem with Prairie blazing star is that corms grow vegetatively and expand beyond the small circle melted into the weed barrier fabric. We noticed this occurrence initially in our Adel wildflower plot. The center or original corm was rotted and eaten by June bug larvae and the new corms produced are hidden in the darkness of the weed barrier fabric surrounding the original corm. Solution: Corms can be easily divided in the spring and replanted to ensure continued seed production.



Prairie blazing star (*Liatris pycnostachya*)-Adel plot

Slow seed production and difficult seed cleaning. Compass plant is one of the tallest prairie species and therefore is a highly visible species in a reconstruction. Along with one of the tallest species, it also has one of the largest seeds, looking

like a flattened sunflower seed. Unlike most flowers, seeds comprise the outer ring of the flower. Cleaning the seed is the challenge with Compass plant. Inert material is often the same size as the seed; therefore, complete machine cleaning of this species is not realistic. We rely on hand stripping and cleaning by inmate labor. Seed production by compass plant is a minimum of 3 years, but usually 4 years before full production is obtained.

Perennials. Canada milk vetch has been another challenging species that we have encountered with seed production. The first challenge is to find good seed. In wild populations, seed is often eaten and destroyed by Buchid beetles. Once the seed is collected, germination is fairly easy; scarify the seed, and germination will take place in about 10-14 days. Seed production is gained in the second year of the plant. Then, the third-year problems occur.



Canada milkvetch (*Astragalus canadensis*)

Seed production shrinks to almost zero, but the plants are still alive! Year four seed production again takes place, but it is only about half of year two production. Year five comes along and all plants are gone! It is time to start over again. I was shocked when this pattern repeated itself several times in all of our Canada milkvetch populations. Last year we started from scratch again with Canada milkvetch. It will be a part of the mixes sent to public lands across the state.

Starting a new endeavor can be a challenge. Some things go better than expected; some things go worse. Even though we are in the seventh year of seed production of prairie species, we continue to learn new and better ways to produce seed. Right now, our focus will be to increase production on twenty five species where we have good strategies for seed production. This will allow us to produce a larger quantity of wildflower seed for higher quality reconstructions statewide.

Species Spotlight: Spiderwort

By Jim Hanson

There are four species of Spiderwort native to Iowa: Prairie spiderwort (*Tradescantia bracteata*), Ohio spiderwort (*Tradescantia ohioensis*), Western spiderwort (*Tradescantia occidentalis*), and Virginia spiderwort (*Tradescantia virginiana*). The two most common to Iowa are the Prairie and Ohio spiderwort species with Prairie widespread throughout the state and Ohio in the southeast half of the state.



Ohio spiderwort (*Tradescantia ohioensis*)-Montrose plot
Photo by Susan Clark

Ohio spiderwort is the tallest of the species growing to about three feet in height. It prefers sandy, open sites throughout prairies. Prairie spiderwort generally grows only half as tall as the Ohio species. Like the Ohio spiderwort, Prairie spiderwort grows in sandy, open areas but will also tolerate low-lying areas. Western spiderwort is a rare species found only in Woodbury County in moist, sandy soils. Virginia spiderwort is found in open sites as well as open woodlands mainly in the southeast portion of the state.

Spiderworts have long, slender leaves that are bluish-green in color with a rubbery feel to them. The stem is most commonly silver to a reddish-purple in color. Flowers of Ohio spiderwort are deep blue in color. Prairie spiderwort is purple to pink or occasionally white, with each flower having three

petals. The flowers open in the early morning and close in the afternoon to conserve moisture. Spiderwort blooms late May through August.

Native Americans once used the plant as a cure for spider bites hence the name. In the Prairie Resource Unit's seed production plots, the resinous juice is an adverse product of the plant. When harvesting seed, the juice coats hand clippers, arms, hands, and any exposed skin, leaving a glue-like coating when dry.

This time of year is a great time to get out and see spiderwort coming into bloom from a drive in the country to hiking a wildlife area or park, go enjoy the shades of blue.

Volunteer with the Prairie Resource Unit



DMACC students clearing Little bluestem prairie



Fort Dodge Alternative students transplanting



Southeast Webster 5th grade students landscaping the Prairie Resource Center

Interested in learning more about prairie? Come **volunteer** at the Prairie Resource Center. We can use help in weeding our seed production plots, collecting seed, cleaning seed, and transplanting wildflowers in our greenhouse. You will have a “hands-on” learning experience with over 70 species of native Iowa prairie species.

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