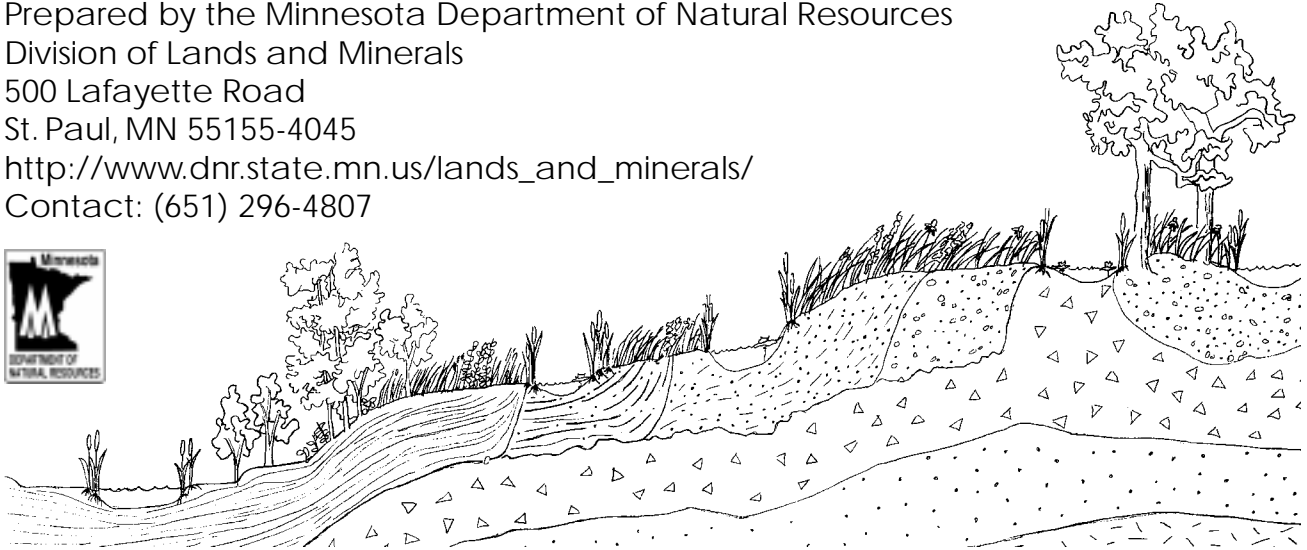


Using Native Prairie Species for Reclaiming Aggregate Mining Sites

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Prepared by the Minnesota Department of Natural Resources
Division of Lands and Minerals
500 Lafayette Road
St. Paul, MN 55155-4045
http://www.dnr.state.mn.us/lands_and_minerals/
Contact: (651) 296-4807



WHAT IS PRAIRIE?

“Prairie,” in the simplest of terms, is a community of plants. Prairie plants are specially adapted to the climate and conditions found in western and southern Minnesota including extremes of temperature and weather, and high winds. Before European settlement 150 years ago, prairie covered much of southwestern and western and northwestern Minnesota. The extreme conditions and constant grazing by bison kept competing plants to a minimum. Prairie plants have long roots that hold the soil in place and allow the plants to survive drought. They are perennial, surviving the winter.

There are several different types of prairie in the Midwest. The tallgrass (or mesic) prairie, common in areas of moderate soil moisture levels, was typically found in western Minnesota where prairie grasses sometimes grew six feet high. Prior to European settlement, almost the entire Red River Valley consisted of tallgrass prairie.

USING PRAIRIE SPECIES FOR RECLAMATION

At depleted aggregate mining sites in areas where tallgrass prairie occurs, it is reasonable to consider revegetating with native prairie plants. Certain key characteristics of prairie plants make them a good choice for former mining sites. Because they are perennial, native prairie grasses, once established, can provide a long-term cover that is self-sustaining and requires little maintenance. Mowing may be needed, and prescribed burning is recommended on a rotation starting three or four years after planting.

Although a former aggregate site restored with native species offers many benefits, it does not restore native prairie. Restoring more than a fraction of the species found in a native prairie is beyond present capabilities because seed sources are not readily available in commercial quantities for all prairie species.

In places where tallgrass prairie does not occur, and in certain other locations, native prairie plants may be inappropriate for reclamation projects. Most warm-season prairie grass seed germinate late, most need prolonged moisture and warm soil. Areas seeded with native prairie plants may not germinate until the spring after initial seeding. Warm-season prairie grasses establish an extensive root system during the first year. The top growth is limited to small leaves that can be difficult to identify. Full scale plants develop during the second year. To compensate for slow establishment of prairie plants, a cover crop of wheat or oats can be planted along with the native seeds. Cover crops grow quickly, providing protection for the slower establishing native species. In addition, cover crops tend to die off rapidly, within one or two years, and therefore do not compete with more permanent native cover.

The slow initial growth of native plantings makes them less effective in erosion-prone locations. They are, therefore, not recommended on steep slopes composed of erodible soils. In addition to possible problems with slow development, prairie seed can be relatively expensive and can be difficult to find. Sometimes, a specially-adapted seed drill is needed for large areas. Adequate site preparation and regular weed control are essential for establishment. Due to the increasing popularity of native prairie plantings, however, these difficulties are quickly being overcome. Although the initial costs may be higher, the long term benefits of native plantings are great. Provided below are basic guidelines for planting native species.

GENERAL GUIDELINES

Site preparation:

Native plantings need a firm weed-free seed bed. Several herbicide applications followed by disking or mowing may be necessary on sites where vegetation is already established.

Seed source:

Seed harvested from as close to the project site as possible will preserve genetic characteristics and establish the vegetation types best adapted to the site.

Seed mixture and seeding rate:

The seed mixture and the seeding rate used for a reclamation project should be selected based on the site characteristics. In general, a diverse mix of grasses and forbs will provide the best results at a seeding rate in the range of 15 lbs/acre to 30 lbs/acre. If seed is harvested from a nearby site and used for reclamation, an analysis of the seed harvest should be conducted and additional seeding may be needed to complement the planting. Seed purchased from vendors can be blended to contain a diversity of species. The Minnesota Department of Transportation (Mn/DOT) has developed several general seed mixes for use on roadsides and ditches. The mixes are a baseline that can be modified as appropriate for local conditions. For more information on native species seed mixes, consult Mn/DOT's Year 2000 Standard Specifications for Construction, or contact Mn/DOT at (651) 284-3750.

Seeding method:

Native seed can be planted using a specially adapted drill that accommodates the light fluffy native seed. The final planting depth should be $\frac{1}{2}$ to 1 inch and maximum row spacing of about 8 inches, at right angles to surface drainage. An alternative to drilling is to till the site and broadcast the seed. Planting depth should be from $\frac{1}{4}$ to $\frac{1}{2}$ inch. After seeding, the site should be dragged with a rake or harrow and packed. Hand seeding is a good method for small areas.

Hydroseeding is an acceptable seeding method on steep slopes or other areas inaccessible to a seed drill. Hydroseeding is not recommended if the weather is hot and dry.

Cover crop:

A cover crop can be seeded with native seed mixtures. The type of cover crop depends on the season. Some possible cover crops are oats at a rate of 20 lbs/acre in the spring plantings, winter wheat at 20 lbs/acre for fall plantings, and annual rye grass at 10 lbs/acre for dormant seedings.

Timing:

Native grasses should be planted from May 1 to June 30. Seeding may be done in the fall, but the seeding rates should be increased slightly to account for seed mortality over the winter. Many species of wildflowers require a cold period to break dormancy and are best seeded late in the fall. If seeded in the spring, they may not be seen until the second year after planting. Seedling plants can be used to add diversity to the plantings. Some desirable species are difficult to propagate from seed and are only available as seedlings.

Maintenance:

During the first growing season, if the cover crop or annual weeds reach 18 inches or more in height, the site should be mowed to a height not less than 6 inches with a rotary mower. Prescribed burns can be implemented on a three to five year rotation starting the third or fourth year after planting. Fall haying is an alternative in areas where burning is not possible.

For more information:

Contact your local DNR area office, local Natural Resource Conservation Service office, or the U.S. Fish and Wildlife Service.

