



What's Working:

Vegetation Establishment & Maintenance

February 2015

Seed Collection and Seed Mix Use

- A small group of staff and/or volunteers can easily harvest a diverse mixture of seed sufficient to convert tens to hundreds of hectares of cropland per year if they follow several guidelines:
1) Develop and refine a comprehensive list of seed sources (remnant prairies, established prairie seedings, etc.) for each species to be harvested, along with approximate harvest dates – from late spring through the fall. -2) Harvest entire seed heads or plant tops, instead of individual flowers, and strap buckets or bags to your waist to free up both hands for harvesting. 3) Harvest from multiple seed sources to help ensure genetic diversity, but select sites where the target species is abundant and easy to access (Lessons Learned from the TNC Grassland Restoration Network: 2003-2010).
- Mounting a stripper head (a.k.a. rice head) on the combine, rather than a small grain head with a sickle bar and reel, can reduce many problems associated with passing large quantities of fluffy and/or stemmy material through the inner workings of a combine. When using a stripper head, most operators simply remove most or all of the screens and/or shakers from the rear of the combine and allow anything the stripper head picks up to go directly into the bin of the combine (Lessons Learned from the TNC Grassland Restoration Network: 2003-2010).
- When possible, seeds should be stored in cool dry conditions. Climate controlled rooms can be useful, particularly for multi-year storage, but seeds of most prairie species can maintain their viability for a year or two even in uninsulated metal buildings, especially when stored in large piles or in paper sacks that allow them to breathe and provide insulation. The seeds of some early spring-blooming plants can be the most vulnerable to loss of viability, even in climate controlled conditions. Experimentation has shown that some of these species establish best when they are planted immediately after they are harvested (Lessons Learned from the TNC Grassland Restoration Network: 2003-2010).
- The following information summarizes efforts to collect hardstem bulrush seed to restore an area where the species was removed along a lakeshore. We collected intact bulrush seed heads from a permitted area over several collecting sessions. It took a diligent effort to collect approximately 1 kg of seed heads. Using Prairie Meadows' 8:1 rule of thumb for conversion to clean seed, we have approximately 100g of seed. Based on structural parameters visible with microscope, we were advised that a surprisingly high > 90% of the sample was structurally sound and therefore potentially viable. We then crushed half of the seed head lot and removed enough stems for the seed to feed through the broadcaster. The seed was mixed with sawdust to allow uniform application, broadcast over the 55 x 42



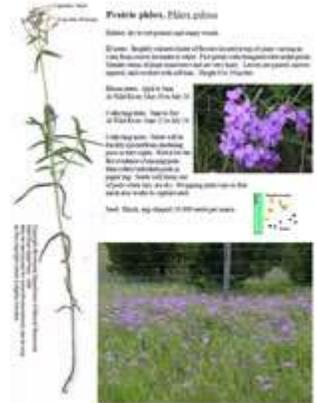
restoration site and then cultipacked on Wednesday, November 21st. Conditions were excellent this fall for lakeshore seed broadcast (Hugh Valiant).

- Kids can effectively collect and help sow seed. It is helpful to have them focus on one species when collecting as a group. School groups are particularly good at ensuring that seed is randomly planted. Seed collection and sowing seed are good activities for kids and adults to do together to establish an appreciation for native plants and natural habitats (Dave Crawford).



- Species Steward volunteers play an important role in collecting the greatest possible diversity of native prairie seed at Wild River State Park. Individual stewards are taught 1-12 species that they track of over time and collect when they are ripe. [Handouts](#) showing plant characteristics and the appearance of seed are used to provide guidance to the Stewards. Stewards become experts about the characteristics of their species; they record bloom date and time and location of populations. In some cases, stewards use specialized techniques to collect seed such as wrapping mesh around seed pods that burst (phlox, flowering spurge) and provide protection such as wrapping citrus bags around plants (larkspur, Indian hemp) to prevent grazing by deer (Dave Crawford).

- Collecting by Species Stewards begins with the first ripe seeds on cool-season species and ends with volunteers and school groups collecting mass quantities of fall-ripening seed. Seed is scarified and separated from chaff by using antique grain processing mills: a hammer mill and a Clipper model 2B fanning mill with custom screens. Seed is dry cold stratified over winter and hand-sown in May on sites prepared with prescribed burns. Seed of less common species is planted in concentrations to help assure that new breeding populations are established. Trials are under way using plugs grown from harvested seed to establish new populations (Dave Crawford).



- The Minnesota Wildflower/Grass Producers Association website (www.mnnwgpa.org/) includes a list of native seed vendors that can help with the development of seed mixes.
- With the District's "Prairie Ecosystems Restoration Project" the Minnesota Crop Improvement Association is inspecting Martin County prairie remnants to verify the genetic origin of native plant material growing there. Funding for this project was provided by the Minnesota Environmental Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR). The project is funded with \$80,000 of Trust Fund Dollars and a \$20,000 local match. The focus of this project is to help preserve declining local ecotype native plant species by collecting native plant materials from vulnerable prairie remnants and propagating them and establishing them on land protected by perpetual conservation easements. These sites, once established, can provide a potential supply of source identified local ecotype native plant material for the establishment of plots that could be increased for use on local restoration projects (Martin SWCD).

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- Including a good percentage of early successional cool-season plants in the seed mixture seems to help keep weeds down while establishing native prairie plantings (Martin SWCD).
 - On sites prone to Canada thistle establishment, having a strong Canada Wild Rye component as well as composite forbs, like Black eyed Susan and Yellow Coneflower seems to put pressure on the thistle populations. Some of these species can be incorporated at slightly higher rates without significantly raising the cost of plantings. After a few years, the later succession plants will become more dominant and suppress the germination of weed species (Martin SWCD).
 - Using early, medium and late successional species in seed mixes helps ensure long-term sustainability.
 - Determining appropriate levels of cover crops in mixes (not relying on cover crops for greening a site as they may create too much competition for native species in some cases). Most sites where erosion is not a risk requires little or no cover crops, although mulching is typically advisable.
 - We usually design our own mixes. In general we try to have much species diversity as possible. At \$400/acre (\$300 DNR + \$100 cost share) we can often get 60-80 species of grasses and wildflowers (DNR Roadside for Wildlife Program).
 - Here is some basic information about our restoration methods using native (wild harvested) seed.
 - Annually, we submit samples to a lab in Nebraska, so we do have germ rates/TZ tests for spp detected. I think it's pretty representative of our mixes.
 - In a 2010 harvested mix we had 12 grasses and 23 forb spp. were detected (33%grass, 66% forb)
 - 8 of 12 grasses are warm-season; 4 are cool-season
 - In 2010 we harvested over 20,000 pounds and sample sizes tended to be relatively small so the tests are likely missing some spp.
 - In recent veg. surveys of restorations, spp. number has exceeded 50 in some areas-the tests only give a glimpse of the primary spp
 - A note on harvest: the mixes are harvested from remnant prairies; at times, we do supplement the mix with seed purchased from local vendors and hand-harvested seed; the more species, the better (esp forbs)
 - We prefer to seed over the snow in late winter (March) using Vicon broadcast seeders.
 - Based on the seed test (PLS/bulk #) and a seeding rate of 2 million PLS/ac or 45 PLS/ft, this translated into a seeding rate of 21 bulk #s/ac for this particular mix. Comparing that to other mixes from the past, last year was a pretty good year as previous years' mixes ranged from 24-34 bulk #s/ac.
 - Our preferred method of invasive control is cultural- "let the plant community heal itself". We believe that over time, as the planted seeds germinate, seedlings anchor, and the plants grow, the native species will outcompete the nonnative spp for light, space and nutrients (Rebecca Esser, U.S. Fish and Wildlife Service).
 - A new guide has been developed on developing site specific seed mixes for roadsides. An electronic copy of the guide can be found at: <http://www.lrrb.org/PDF/201020.pdf>