Plant Materials Program

Seeding Pollinator Plots

USDA Natural Resources Conservation Service, Plant Materials Center, Bismarck, North Dakota

Seed and Seeding

Forb and legume seed, also known as wildflower seed, varies greatly in size, shape and weight. Seeds per pound can range from thousands to millions. Seed of similar size and density can be mixed together for seeding. Pollinator plots less than 5 acres are usually planted by broadcasting the seed, and harrowing/packing. Minimum amounts of small seed do not work well in larger drills. Generally, when plots are larger than 5 acres, it is advantageous to use a drill because of more precise calibration and seed placement. A firm seedbed is required with either operation in order to maintain a planting depth of ¼ inch or less. Some visible seed on top the ground after seeding is desirable, and indicates that the seed was not planted too deep.

Seed mixtures should contain up to 25 percent bunch grasses to help add diversity and pollinator nesting structure to the planting. Grasses also provide physical support for the forbs and legumes when they are flowering, open space for ground nesting bees, and erosion control and cover as the plantings mature.

Preparing the Seedbed

A weedy plot should not be planted. Control weeds by herbicides or tillage before planting. Consider a year of weed control before seeding if the plot has an existing grass cover such as smooth bromegrass or quackgrass. There are very few herbicides that can control broadleaf weeds or perennial grasses in pollinator plots after they are seeded. Plots should be prepared with a minimum of residual cover and have a firm, smooth surface. Adult footprints should be hardly visible. If the area is to be broadcast seeded, there must be enough loose soil on the top to cover most of the seed before the packing operation. Program requirements may dictate seeding methods.

A firm seedbed is required for small seed.

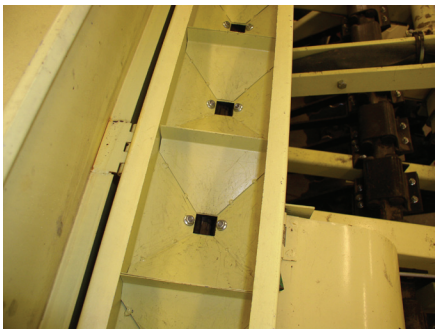
Seed should be pressed firmly in the ground after broadcast seeding.

Do not seed into heavy duff or litter layers.

Drilling Seed

Drilling the seed is the most effective way of obtaining proper seeding depth and seed to soil contact necessary for quick germination. No-till drilling into sod residue is discouraged. Seed can attach to the residue and not have proper contact with the soil. Most of the pollinator species, including free-flowing grasses, can be seeded through the small (legume) box of a drill. Purchased seed should be fully processed or debearded (awns/fuzz removed) to allow better seed flow through the drill. Seed such as black-eyed susan, purple prairieclover, Lewis flax, western yarrow, and leadplant should be seeded through the legume box. Most forb and legume seed is small enough to go through this box. Legume species, such as leadplant and the prairieclovers, should be purchased as naked seed (already removed from the pod). Seed still in the pod is slow to germinate. Most processed grass seed planted at a rate of 25 percent or less will also go through the legume box. Sideoats grama is usually sold in “seed clumps” and will not go through the feed cup in the legume box unless the clumps are broken apart (hammer milled). Seeding rate is controlled by opening and closing a slide mechanism that changes the hole size in the cup of the legume box.

Black-eyed susan is a small seed that can settle to the bottom in the large drill box.



The small legume box is best for small seed.

Various carriers (clay oil absorbent, cracked corn, and chick starter) can be mixed with the seed.

Larger areas to be seeded with a higher volume of seed may be planted through the wheatgrass (small grain) box on a drill. This is the back box, and it usually has an agitator to keep the seed well mixed. This box does not work well with smaller quantities of seed because it does not have separate compartments for each row. Cardboard dividers can be added to help keep seed distributed over the feed cup. Seed needs to be monitored frequently to ensure that seed cups are full and agitators are properly mixing the seed. **Caution: Never put your hand in the seed box of an operating drill.** Smaller, heavier seed tends to fall to the bottom of this box and should be seeded only through the legume box. Another technique would be to spread a handful of seed in front of the drill as you are seeding, or mix a small amount in the box every round or two. The seed should be spread as uniformly as possible over most of the field. Carriers can be mixed with the seed to help in calibration.

A third box for “chaffy/awned” seed is often included as the middle box on a grass drill. This is for light, fluffy seed that will not flow. Seed is pulled into the seed tubes by “picker wheels.” It is usually possible to calibrate a low seeding rate for this box without the use of a carrier. Air drills are not recommended because they have difficulty seeding mixtures of different sizes and shapes of seed.

Broadcast Seeding

Small areas of less than 5 acres can be established by broadcasting the seed. The site should have low residue and preferably tilled for maximum seed to soil contact. Do not broadcast seed on existing duff or litter layers. Wheel-driven or hand operated whirly-bird broadcast seeders work well. Wheel-driven spreaders can be pulled with a garden tractor or ATV. Carriers can be mixed with the seed when broadcasting small amounts. Try to match the size of the carrier to the size of the seed. Chick starter grit is a good choice for smaller-sized seed mixes. Cracked corn works well with larger-sized seed mixes. A ratio of 3:1 and a travel speed of 4 to 5 MPH is a good starting point. Be sure to overlap applications and avoid skip areas that can become weed problems. Remember that different sizes and densities of seed will be spread different distances. Drop spreaders (fertilizer spreaders) are also available. Care must be taken so the seed does not bridge in the spreader. After seeding, the field may be lightly harrowed (chain link fence) to cover the seed and smooth the field. Spike or spring-tooth harrows often bury the seed too deep, unless set flat to the ground. Finally, the planting must be packed with the seed firmly pressed into the ground. If a packer is not available, tractors with dual tires or drills with packer wheels can be used.

Various broadcast spreaders are available.

Drop spreaders have adjustable plates over the seed opening.

Hand broadcast spreaders work well in small areas.

Example Mixes with Starting Point Settings

(actual calibration will vary with each individual seeder)

Mixes	Drill legume box (cup opening)	Broadcast (12' throw)
Black-eyed susan (10%) western yarrow (10%) purple prairieclover (20%) yellow coneflower (20%) Maximilian sunflower (10%) purple coneflower (10%) blue flax (20%) Total 2.94 PLS lb/ac; estimated 80% PLS = **3.6 bulk lb/ac**	1/4"	1/4" whirly-bird slide hole 3:1 chick starter 4-5 MPH
Same forb and legume mix as above, except has a 25% grass mixture including little bluestem (10%), big bluestem (10%), and green needlegrass (5%) approximate total 4 PLS lb/ac; estimated 80% PLS = **5 bulk lb/ac**	3/8"	1/4" whirly-bird slide hole 3:1 chick starter 4-5 MPH

Keys to a Successful Pollinator Planting

- Buy quality seed of adapted varieties or northern sources.
- Include up to 25 percent grass species, preferably native bunch grasses.
- Control invasive grass species such as bromegrass, bluegrass and quackgrass with herbicides **before planting.**
- Seed no deeper than 1/4 inch into firm, weed-free seedbed.
- Calibrate drills and seeders. Broadcast seed in multiple applications so you don't run out and from different directions to avoid skips.
- Pack all broadcast seed, pressing firmly into the ground.
- Mow early and several times (if necessary) for weed control. Do not mow after July 15.
- Spot treat noxious/invasive weed problems.
  Reminder: Forb and legume species will probably be killed with herbicide application.

Typical seed mix with 25% grass

Grass helps support the flowers and creates a more natural plant community.

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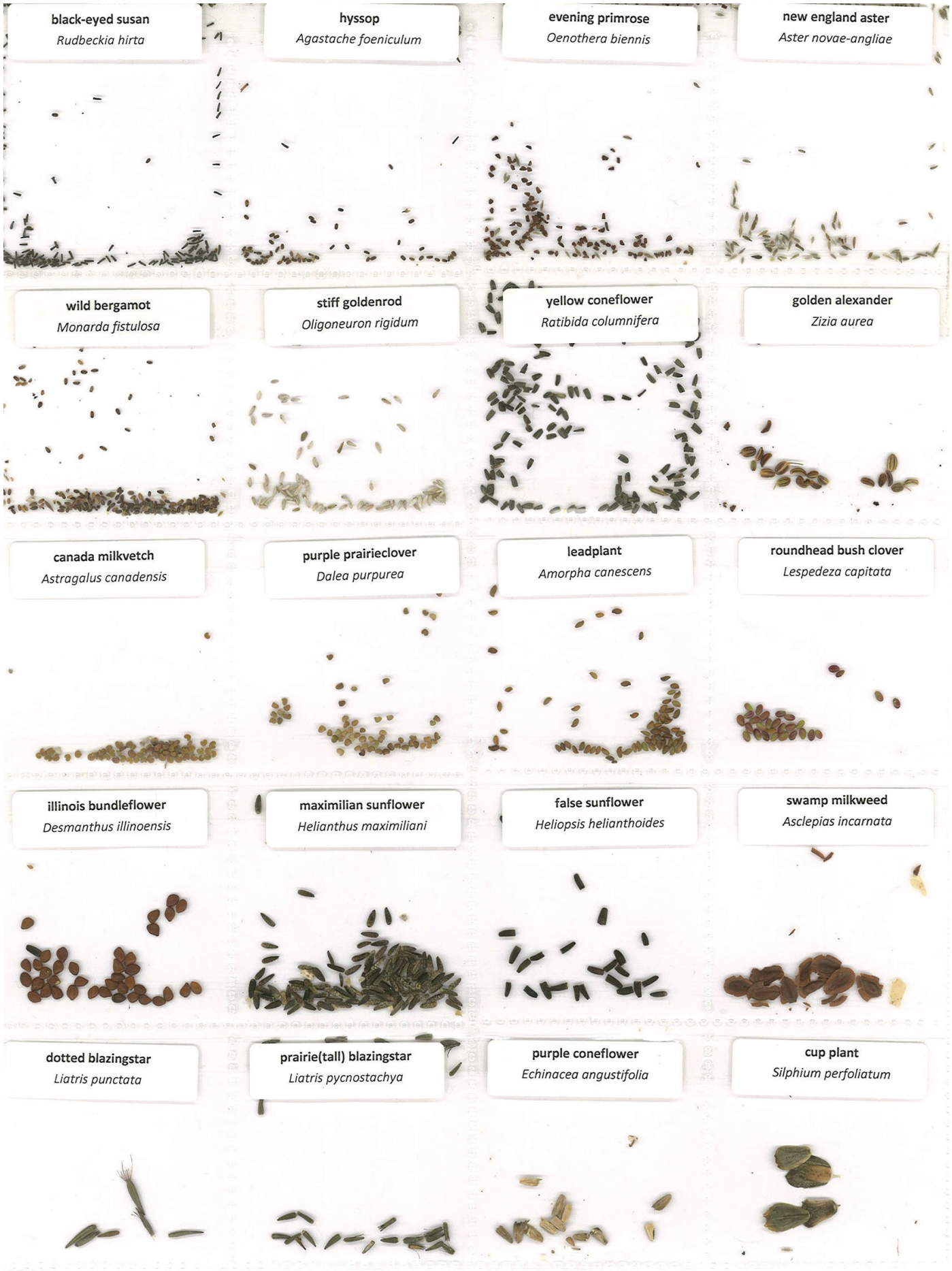
All programs and services are offered on a non-discriminatory basis.


black-eyed susan
Rudbeckia hirta
hyssop
Agastache foeniculum
evening primrose
Oenothera biennis
new england aster
Aster novae-angliae
wild bergamot
Monarda fistulosa
stiff goldenrod
Oligoneuron rigidum
yellow coneflower
Ratibida columnifera
golden alexander
Zizia aurea
canada milkvetch
Astragalus canadensis
purple prairieclover
Dalea purpurea
leadplant
Amorpha canescens
roundhead bush clover
Lespedeza capitata
illinois bundleflower
Desmanthus illinoensis
maximilian sunflower
Helianthus maximiliani
false sunflower
Heliopsis helianthoides
swamp milkweed
Asclepias incarnata
dotted blazingstar
Liatris punctata
prairie(tall) blazingstar
Liatris pycnostachya
purple coneflower
Echinacea angustifolia
cup plant
Silphium perfoliatum