Pollinator Plot SE 38-641

Updated: 2023

This mix has been designed to supports specialist bees, many Lepidoptera species and includes a wide range of plant families to maximize insect use, bloom periods and the long-term resiliency of the mix.

Partners also include collaboration among Non-profits, Seed vendors, SWCD, Tribal Governments, Consultants, County and Cities. (See partner list on website)

38-641 **Pollinator Plot Southeast Mix**

Code	Common Name	Scientific Name	PLS lb/ac	% by PLS lb/ac	Seeds/ ft2	% by Seeds/ft2
andger	Big Bluestem	Andropogon gerardii	0.14	0.69%	0.51	1.12%
boucur	Sideoats Grama	Bouteloua curtipendula	1.35	6.70%	2.98	6.46%
brokal	Prairie Brome	Bromus kalmii	0.03	0.15%	0.09	0.19%
elycan	Canada Wild Rye	Elymus canadensis	0.24	1.19%	0.46	1.00%
koemac	June Grass	Koeleria macrantha	0.01	0.05%	0.73	1.60%
panvir	Switchgrass	Panicum virgatum	0.10	0.50%	0.51	1.12%
schsco	Little Bluestem	Schizachyrium scoparium	0.54	2.68%	2.98	6.46%
sornut	Indiangrass	Sorghastrum nutans	0.15	0.74%	0.66	1.44%
spohet	Prairie Dropseed	Sporobolus heterolepis	0.09	0.45%	0.53	1.15%
		Grasses Subtotal	**2.65**	**13.15%**	**9.45**	**20.53%**
carbre	Plains Oval Sedge	Carex brevior	0.05	0.25%	0.53	1.16%
		Sedges & Rushes Subtotal	**0.05**	**0.25%**	**0.53**	**1.16%**
achmil	Common Yarrow	Achillea millefolium	0.02	0.10%	1.31	2.85%
amocan	Lead Plant	Amorpha canescens	0.08	0.40%	0.36	0.78%
anecan	Canada Anemone	Anemone canadensis	0.03	0.15%	0.09	0.19%
anecyl	Thimbleweed	Anemone cylindrica	0.02	0.10%	0.19	0.42%
ascsyr	Common Milkweed	Asclepias syriaca	0.14	0.69%	0.21	0.45%
asctub	Butterfly Milkweed	Asclepias tuberosa	0.06	0.30%	0.09	0.21%
astcan	Canada Milkvetch	Astragalus canadensis	0.02	0.10%	0.12	0.27%
chafas	Partridge Pea	Chamaecrista fasciculata	0.49	2.43%	0.49	1.06%
corpal	Prairie Coreopsis	Coreopsis palmata	0.01	0.05%	0.04	0.08%
dalcan	White Prairie Clover	Dalea candida	0.03	0.15%	0.21	0.45%
dalpur	Purple Prairie Clover	Dalea purpurea	0.36	1.79%	1.98	4.31%
descan	Showy Tick Trefoil	Desmodium canadense	0.05	0.25%	0.10	0.22%
dryarg	Prairie Cinquefoil	Drymocallis arguta	0.01	0.05%	0.84	1.84%
genand	Bottle Gentian	Gentiana andrewsii	0.01	0.05%	1.03	2.23%
helaut	Sneezeweed	Helenium autumnale	0.01	0.05%	0.48	1.04%
helmax	Maximilian's Sunflower	Helianthus maximiliani	0.02	0.10%	0.10	0.21%
helpau	Stiff Sunflower	Helianthus pauciflorus	0.03	0.15%	0.04	0.10%
helhel	Ox-eye Sunflower	Heliopsis helianthoides	0.21	1.04%	0.49	1.06%

heuric	Prairie Alumroot	Heuchera richardsonii	0.01	0.05%	2.57	5.59%
liaasp	Rough Blazing Star	Liatris aspera	0.01	0.05%	0.06	0.13%
lialig	Meadow Blazing Star	Liatris ligulistylis	0.03	0.15%	0.11	0.24%
liapyc	Prairie Blazing Star	Liatris pycnostachya	0.01	0.05%	0.04	0.09%
lupper	Wild Lupine	Lupinus perennis	0.02	0.10%	0.01	0.02%
lytala	Winged Loosestrife	Lythrum alatum	0.01	0.05%	1.10	2.39%
monfis	Wild Bergamot	Monarda fistulosa	0.04	0.20%	1.03	2.23%
monpun	Spotted Bee Balm	Monarda punctata	0.02	0.10%	0.66	1.44%
oenbie	Common Eveninig Primrose	Oenothera biennis	0.02	0.10%	0.66	1.44%
pedcan	Wood Betony	Pedicularis canadensis	0.01	0.05%	0.14	0.31%
pengra	Large-flowered Beardtongue	Penstemon grandiflorus	0.08	0.40%	0.41	0.89%
phlpil	Prairie Phlox	Phlox pilosa	0.01	0.05%	0.07	0.15%
pycvir	Virginia Mountain Mint	Pycnanthemum virginianum	0.01	0.05%	0.81	1.76%
ratpin	Yellow Coneflower	Ratibida pinnata	0.05	0.25%	0.55	1.20%
rudhir	Black-eyed Susan	Rudbeckia hirta	0.07	0.35%	2.37	5.14%
scrlan	Early Figwort	Scrophularia lanceolata	0.01	0.05%	0.68	1.48%
silper	Cup Plant	Silphium perfoliatum	0.02	0.10%	0.01	0.02%
solnem	Gray Goldenrod	Solidago nemoralis	0.01	0.05%	1.10	2.39%
solrig	Stiff Goldenrod	Solidago rigida	0.06	0.30%	0.90	1.96%
solspe	Showy Goldenrod	Solidago speciosa	0.03	0.15%	0.88	1.92%
symeri	Heath Aster	Symphyotrichum ericoides	0.01	0.05%	0.73	1.60%
symlae	Smooth Blue Aster	Symphyotrichum laeve	0.03	0.15%	0.61	1.32%
symnov	New England Aster	Symphyotrichum novae-angliae	0.03	0.15%	0.72	1.56%
symool	Sky Blue Aster	Symphyotrichum oolentangiense	0.02	0.10%	0.59	1.28%
trabra	Prairie Spiderwort	Tradescantia bracteata	0.03	0.15%	0.11	0.24%
verstr	Hoary Vervain	Verbena stricta	0.08	0.40%	0.82	1.79%
vervir	Culver's Root	Veronicastrum virginicum	0.01	0.05%	2.94	6.38%
vioped	Prairie Violet	Viola pedatifida	0.01	0.05%	0.10	0.22%
zizaur	Golden Alexanders	Zizia aurea	0.10	0.50%	0.40	0.88%
		Forbs Subtotal	**2.45**	**12.16%**	**29.36**	**63.79%**
cover	Oats/Winter Wheat	Avena sativa/Triticum aestivum	15.00	74.44%	6.68	14.52%
		Cover Crop Subtotal	**15.00**	**74.44%**	**6.68**	**14.52%**
		Total	**20.15**	**100.00%**	**46.02**	**100.00%**

Seed Mix Enhancements or Substitutions

List of Additional Species to Add Diversity or for Substitutions of seed or plugs.

Pollinator Plot Southeast 38-641

Updated 11-10-2020

Grasses:

Scientific Name	Common Name
Bouteloua hirsuta	Hairy Grama
Bromus ciliatus	Fringed Brome
Elymus riparious	Riverbank Wild Rye
Elymus villosus	Downy Wild Rye
Hesperostipa spartea	Porcupine Grass
Panicum virgatum	Switchgrass
Sorghastrum nutans	Indian Grass

Forbs:

Scientific Name	Common Name
Artemisia ludoviciana	*Prairie sage*
Asclepias verticillata	Whorled Milkweed
Baptisia bracteata var. glabrescen	Plains Wild Indigo
Boltonia asteroides	False Aster
Chelone glabra	White Turtlehead
Circium discolor	Field Thistle
Doellingeria umbellata	Flat-topped Aster
Drymocallis arguta	Tall Cinquefoil
Euthamia graminifolia	Grass-leaved goldenrod
Galium boreale	Northern Bedstraw
Heuchera richardsonii	Alumroot
Lespedeza capitata	*Round-headed bush clover*
Liatris punctata	Dotted Blazing Star
Lobelia spicata	Rough-spiked Lobelia
Lupinus perennis	Wild Lupine
Lysimachia ciliata	Fringed Loosestrife
Lysimachia quadriflora	Prairie loosestrife
Mimulus ringens	Blue Monkey Flower
Pediomelum argophyllum	Silverleaf Scurfpea
Pediomelum esculentum	Prairie Turnip
Penstemon gracilis	Slender Beard Tongue
Physostegia virginiana	Obedient Plant
Rosa arkansana,	Prairie Rose
Silphium laciniatum	Cup Plant
Sisyrinchium montanum	Mountain Blue-eyed Grass
Smilacina racemosa	False Solomons Seal

Solidago nemoralis	Gray Goldenrod
Solidago ptarmicoides	Upland White Aster
solidago riddelii	Riddell's Goldenrod
Symphyotrichum oolentangiense	Skyblue Aster
Symphyotrichum sericeum	*Silky Aster*
Teucrium canadense	Germander
Thalictrum dasycarpum	Tall Meadow-Rue
Tradescantia ohiensis	Ohio Spiderwort
Verbena hastata	Blue vervain
Vernonia fasciculata	Bunched Ironweed
Zizia aptera	Heart-leaved Alexanders

Legumes:

Scientific Name	Common Name
Astragalus crassicarpus	Ground Plum
Chamerion angustifolium	Fireweed
Glycyrrhiza lepidota	Wild Licorice
Phlox pilosa	Prairie Phlox
Vicia americana	American Vetch

Bareroot plants or plugs to supplement your planting

Scientific Name	**Common Name**	**Bloom Time**	**Sun/Shade**	**Range**
Carex pensylvanica	Pennsylvania sedge	e/m	Sun, Part Shade	NE,SW,SE,NE
Anemone patens	pasqueflower	e	Sun, Part Shade	NW,SW,SE
Antennaria neglecta	pussytoes	e/m	Sun, Part Shade	NW,SW,SE,NE
Campanula rotundifloria	Harebell	m/l	Sun, Part Shade	NW,SE, NE,
Dicentra cucullaria	Dutchmen's breeches	e/m	Part Shade, Shade	SE, SW, NE
Enemion biternatum	False rue anemone	e/m	Part Shade, Shade	SE
Fragaria virginiana	Wild strawberry	e/m	Sun, Part Shade	NW,SW,SE,NE
Geum triflorum	Prairie smoke	e/m	Sun	NW,SW,SE, NE
Heuchera richardsonii	Alumroot	e/m	Sun, Part Shade	NW,SW,SE,NE

Lithospermum canescens	Hoary puccoon	e/m	Sun, Part Shade	NW,SW,SE,NE
Pediomelum esculentum	Prairie turnip	e/m	Sun	NW,SW, SE
Sanguinaria canadensis	Bloodroot	e	Part Shade, Shade	NW,SW,SE,NE
Silphium laciniatum	Compass plant			
Sisyrinchium campestre	Blue-eyed grass	e/m	Sun	NW,SW,SE,NE
Thalictrum thalictroides	Rue anemone	e/m	Part Shade, Shade	SE
Viola palmata var. pedatifida	Prairie violet	e/m	Sun, Part Shade	NW,SW,SE
Viola pedata	Birdfoot violet	e/m	Sun, Part Shade	SE
Viola spp.	Violets	e/m	Part Shade	NW,SW,SE,NE

Bloom Time:

early
Mid
Late

Pollinator Plot Southeast 38-641 Seed Mix Guidance

Seed mix name: Pollinator Plot Southeast Pilot Mix 38-641

Geographic area: Minnesota, Southeast
Year of development: 2016
Year/s of update: 2022
Status (*Standard or Pilot mix*): Standard
Primary and Secondary Functions:
Primary – Terrestrial habitat for pollinators and other invertebrates and improve habitat for beneficial soil organisms
Secondary – Carbon sequestration, wildlife habitat, emission reductions
Similar State Mixes: Pollinator Plot Southwest, Pollinator Plot Northwest, Pollinator Plot Northeast
Compatible NRCS Practice Standards: 327 Conservation Cover (changing to 420 Wildlife Habitat Planting) - Pollinator Species
Compatible Minnesota CRP Practices: CP42

Suitable Site Conditions

Areas with mesic soils and full sun for at least 70% of the day where land is being converted from other uses such as lawn, or agricultural fields like row crops or pasture.

Seed Mix Highlights

This mix has been designed to supports specialist bees, many Lepidoptera species and includes a wide range of plant families to maximize insect use, bloom periods and the long-term resiliency of the mix.

How to Customize the Mix for Unique Site Conditions and Goals

Site conditions such as sunlight, soils, hydrology and existing vegetation along with functional goals for the project such as pollinator habitat, carbon sequestration, and benefit to grassland bird species can all inform species selection and the modification of seed mixes. See the Additional Species List, which can be used to amplify diversity. Use the BWSR Seed Mix Substitution Table when species are not available from vendors, or the landowner has alternative goals for the site.

Site Preparation

The primary goal of site preparation is to control weed species and provide ideal growing conditions for native seeds or plants to be installed. Preparation methods vary depending on the current site conditions. For example, sites with introduced perennial grasses require different suppression techniques than sites that have been farmed with row crops. Specific conditions should be considered when selecting site preparation techniques: unique biology of current (unwanted) vegetation, potential desirable and undesirable species in the seed bank, previous pesticide use on site, and potential for soil erosion. Annual cover crops or row crops can be used in preparation for a native planting, as long as they are not grown with persistent pesticides such as neonicotinoids or other long-lasting chemicals that may negatively impact pollinators or desirable vegetation establishment. For example, following soybean harvest, an un-tilled soybean field provides a good seedbed with potentially little plant residue for planting native prairie mixes. For fields where persistent chemicals have been used (including neonicotinoids or long-lived herbicides) it is recommended to plant a temporary cover crop for one or two seasons to allow the chemicals to break down in the soil. For more details on organic or pesticide-free site preparation techniques, see the Xerces Society guide, Organic Site Preparation for Wildflower Establishment.

Temporary Cover Crops

Short-lived temporary cover crops can help stabilize project sites in preparation for planting native seed mixes. Cover crops such as oats (the most commonly used species) should be mowed to 10-12 inches before seeds mature (or harvested upon maturity) to prevent re-seeding. Other cover crops typically used in agricultural fields, such as buckwheat, winter wheat, sorghum sudangrass, and radishes, can help stabilize soil, build soil health, or provide weed competition as part of restoration projects. Residues from temporary covers should be minimized prior to seeding to increase seed to soil contact.

Seedbed preparation

Methods that are used to prepare a seedbed can vary depending on the type of seeding equipment to be used. If a traditional native seed drill will be used, a smooth, firm seedbed is required. Soybean fields

usually are sufficiently prepared for a native seed drill. Corn fields should be raked and bailed if possible or light tillage should be used to remove leftover corn residue that would prevent sufficient seed to soil contact. Sites that were recently tilled will require additional soil treatment such as field cultivation, harrowing and rolling to prepare a firm seedbed and prevent seed from being buried too deep. Native seeds will have difficulty germinating if they are buried more than ¼" deep. Broadcast seeding can be conducted on soybean or corn fields; fields that have been disked, should be cultipacked or allowed to settle before seeding. Some practitioners have found that broadcast seeding on a smooth surface (not tilled or disked) leads to the establishment of higher diversity. It is important that the soil surface is not too hard packed, so cultipacking or light harrowing of crop fields before broadcast seeding may be needed. Seed can be lost on smooth surfaces, so it is recommended to seed into temporary cover crops or to roll sites after broadcast seeding. BWSR has seedbed preparation guidance based on current site conditions on our website: https://bwsr.state.mn.us/habitat-establishment-management-resources

Seeding Methods

A variety of seeding equipment is used for upland pollinator plantings including broadcast seeders, no-till native seed drills, Brillion seeders and Trillion seeders. Specialized native seed drills can handle a wide variety of seed (fluffy, smooth, large and small) and low seeding rates. Conventional grain drills are not capable of handling diverse seed sizes and will not provide satisfactory results. Broadcast seeding is common for planting pollinator mixes. Broadcast seeding equipment should be used that is designed to spread mixes with different sized seeds (e.g., Vicon Seeders). NRCS recommends broadcast seeding at a rate of 1.5 times the normal seeding rate and cultipacking after seeding (based on Agronomy Tech Note 31).

Seeding Dates

Forb-dominated pollinator seed mixes can be installed in the spring or fall but fall dormant plantings allow seeds to naturally stratify and settle into the soil through periods of freezing and thawing over the winter. Spring seedings should be done on or around May 1-July 1 when soil temperatures are at least 60 degrees Fahrenheit or higher. Fall seeding should occur when soil temperatures fall below 50 degrees Fahrenheit for a consistent period of time (usually around October 15 in the northern half of the state and November 1 in the southern half of the state). Fall dormant seedings can help reduce weed pressure during the first year of growth because native cool-season grasses and forbs germinate earlier and start competing with weed species right away. Frost seedings are also an option if the snow cover is shallow, ice-free, and winds are calm. For a frost seeding, seeding rates may need to be increased by 25 -50 percent due to lower germination rates and loss of seed that is consumed by wildlife over the winter months.

Management Methods

Establishment Mowing – Mowing can be an important step in the establishment of pollinator plantings that have high pressure from annual weeds. Expect to mow at least twice during the first season and once during the second season with a flail mower or stalk chopper (to prevent smothering plants) to decrease competition and to provide sufficient sunlight for seedlings. Haying is another method to remove mowed vegetation that prevents smothering of the native seedlings. Mowing should be conducted before weeds mature and seed out. It is important that mowed vegetation does not smother the planting; therefore, very productive sites may need to be mowed more often in the first year to

reduce the mulching effect. Vegetation should be mowed to between five and eight inches before seed is allowed to set (usually as weeds reach 12-24 inches). Mowing height should be raised as native plants establish. Mowing too short can be detrimental to the outcomes of a successful planting. Some grassland managers see success without mowing but the need will vary depending on site conditions (such as soil productivity) and weed pressure.

Spot Mowing – As the native plant community is getting established, it may be beneficial to spot mow or weed trim areas with invasive or noxious plants. Spot-mowing should be done at a raised height between 4-6 inches in order to target the invasive plants and to avoid damaging the nearby native species. Spot mowing for control of invasive or noxious weeds can be done every year to increase the diversity and functionality of the planting. A list of noxious/invasive weed species that should be eradicated can be viewed at the Minnesota Department of Agriculture's website. Mowing is a good way to control some species such as thistles, but other methods are needed to control species such as Poison Hemlock, Common Tansy, Leafy Spurge, Spotted Knapweed, Wild Carrot and Wild Parsnip. If there are large areas of these species, it would be helpful to minimize the disturbance of site preparation. There are helpful guidelines in the manual Restoration-Guide-Invasive-Perennial-to-Conservation-Prairie.pdf (nature.org).

Spot Management of Weeds – Some persistent perennial weeds may require digging, pulling, girdling, smothering or spot treatment with herbicides for sufficient control. Some persistent perennial plants include reed canary grass, smooth brome, quack grass, purple loosestrife, Canada thistle, Kentucky bluegrass, crown vetch, birds-foot trefoil, and woody species, such as box elder, common buckthorn, Siberian elm, and Tartarian honeysuckle. Control methods should be conducted carefully during the early establishment phase, to avoid adverse impacts to native plant seedlings. Herbicides should only be used on persistent perennial weeds; most other weeds will be excluded over time as the native planting matures. Herbicide use should be species specific, sprayed in a discriminating and targeted way (minimizing non-target organisms), and applied according to rates specified on the label. All pesticides should be selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment. ---

Prescribed Burning – Prescribed burning is beneficial to remove thatch, control invading woody and invasive plants in prairies, fertilize the soil with ashes, stimulate seed germination and new plant growth, and increase diversity in plantings. Burning is typically initiated after the third or fourth years of establishment, as native plants become the dominant cover. Uplands benefit from burning every three to five years. The timing of a burn can also help with management goals. Late spring burns are used to set back cool-season non-native species such as smooth brome and reed canary grass. Fall burns can release spring-blooming species for pollinators. Fall and spring burns should be alternated periodically to simulate natural variation. Burn plans are needed to define the details of how the burn will be conducted, who will be involved and for contingency planning. In many cases, permits are also required. It is recommended to only burn one-third or less of a project site at a time, especially if there is no adjacent refuge or conservation area nearby for wildlife to escape the fire. Partial burns and burns that are patchy may also benefit pollinator populations if timed correctly (when pollinators are not actively foraging, or pollinators have pupated and are mobile).

What to Expect in Year 1

During the first year of establishment, many native grasses, sedges and flowers will remain about one to three inches tall. Mowing will help to keep agricultural weeds (foxtail, barnyard grass, ragweed etc.) managed so the native plant seedlings receive sufficient water and sunlight. The planting may have a somewhat weedy appearance in the first year (see establishment mowing paragraph above).

(IMAGE)

What to Expect in Year 2

During year two, some of the native grasses, sedges and flowers may reach their mature height and some of them may even flower. Depending on when the seeding was conducted (spring or dormant), there might also be many first-year native seedlings germinating alongside native plants that established the year prior. Mowing may still play a key role in managing weeds and allowing seedlings to grow.

(IMAGE)

What to Expect in Year 3 and Beyond

By the end of year three many of the native plants will be mature and should start flowering. There may be some species that are slow to establish and may not show up for several years.

Problem Solving

Poor Establishment After Year 1 – It is often difficult to determine if a seeding is successful during the first year, as establishment may vary depending on weather conditions and some species may be slow to establish. It is typically best to wait until the second year to conduct any corrective actions. Looks for species such as Black-Eyed Susan seedlings in year 1 for confirmation the seeding was a success.

Poor Establishment After Year 2 – If native plant seedlings are not establishing about every one to two feet it may be necessary to interseed some species into the planting. Monitor the site during the growing season to determine which species are present, and which species may need to be supplemented. Interseeding should be conducted after the second growing season.

High Annual and Biennial Weed Competition – Typically, annual and biennial weed competition is not a big problem in prairie plantings as they are short lived and frequent mowing in the first year of establishment reduces their contributions to the seed bank. In addition, perennial native plants tend to outcompete annual and biennial weeds as the planting matures.

High Perennial Weed Competition – Dense establishment of perennial species can be a problem as it can prevent the establishment of native species. Prescribed burning, prescribed grazing, and/or spot herbicide application may be needed to manage perennial weeds.

Low Forb Diversity After Year 3 – If grasses and sedges are establishing successfully but there is a lack of forbs it is recommended to interseed additional forbs in late fall or after a prescribed fire in spring or fall. See the Xerces Society guide for additional information and guidance about interseeding wildflowers.