

## Plant Enhancement Activity – PLT15 – Establish pollinator and/or beneficial insect habitat



### Enhancement Description

Seed nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, waterways, shelterbelts, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

### Land Use Applicability

Cropland, Pastureland, Rangeland, Forestland

### Benefits

Increased habitat for pollinators will improve fruit set, size and quality, productivity per acre, biodiversity, beneficial insect populations, and the food base for many

wildlife species. The increased plant diversity of pollinator habitat will enhance wildlife habitat and may increase populations of other beneficial insects, reducing the need for pesticides.

### Conditions Where Enhancement Applies

This enhancement applies to all crop, pasture, range or forest land use acres.

Habitat areas must be at least 0.5 acres for each 40 acres of the selected land use. Where the selected land use is less than 40 acres, the required amount of habitat will be reduced according to the ratio of 0.5 acres to 40 acres. Where the selected land use is greater than 40 acres, the 0.5 acre habitat areas must be interspersed in the larger land use area. For example, for an 80 acre parcel, the required 1 acre of habitat should not be located in one corner of the 80 acre field.

### Criteria

Establish habitat for pollinators (A) and beneficial insects (B) as described below:

#### A. Pollinators

1. Lists of plants suitable for pollinator habitat will be developed by NRCS at the state level. The lists must emphasize as many native species as practical.
2. The habitat planting will include (as a minimum) three early, three mid, and three late flowering species from the NRCS state list including forbs, legumes, vines, shrubs, and/or trees. Plants that produce toxic nectar will not be planted.
3. Site preparation and plant establishment shall be accomplished according to the appropriate NRCS conservation practice and specifications. Management and/or maintenance activities such as mowing, haying, burning, or grazing must be conducted outside of the growing season or bloom period. Maintenance should be done on less than 1/3 of the acreage during any given year.
4. Insecticides and herbicides should not be used in the habitat planting area. Even natural herbicides and botanical insecticides can harm bees and other pollinators. If adjacent



crop areas are treated use one or more of the following actions to limit insecticides in the pollinator habitat area:

- a. Create insecticide free buffers in the first 25 feet of crop area,
  - b. Use application methods that minimizing drift to the adjacent habitat,
  - c. Apply active ingredients in the evening when most insect pollinators are not active.
5. The planted habitat areas must be regularly inspected for invasive and/or noxious plants or other plants that may compromise the purpose of this enhancement. Undesirable species should be controlled using the least damaging method.
  6. Any other use of the pollinator habitat area must not compromise its intended purpose.

#### B. Beneficial insects

1. Identify pest species and associated beneficial insects targeted for control
2. Inventory existing conditions on the farm to determine habitat needs of selected beneficial, including:
  - a. Permanent insectary sites
  - b. Augmentation of existing hedgerows, field borders or other odd areas adjacent to fields
  - c. Trap crop areas
3. Plant selection matched to attract identified beneficial insect
4. Amount of habitat required based on the beneficial insect dispersal ability and can be either annual or perennial cover
5. Lists of plants suitable for beneficial insect habitat will be developed by NRCS at the state level. The lists must emphasize as many native species as practical.

#### C. Planting Criteria for both pollinators and beneficial insects

1. Site selection should consider existing weed pressures and available methods of control, delay planting if weed pressure requires excessive treatment
2. Site preparation and plant establishment shall be accomplished according to the appropriate NRCS conservation practice and specifications
3. Successful establishment is determined by comparing field conditions with published plant density recommendations for the species for the region

#### D. Operation and Maintenance for both pollinators and beneficial insects

1. Management and/or maintenance activities such as mowing, haying, burning, or grazing must be conducted outside of the growing season or bloom period. Maintenance should be done on less than 1/3 of the acreage during any given year.
2. Insecticides and herbicides should not be used in the habitat planting area. Even non-synthetic herbicides and botanical insecticides can harm beneficial insects. If adjacent crop areas are treated use one or more of the following actions to limit insecticides in the pollinator habitat area:
  3. Create insecticide free buffers in the first 25 feet of crop area,
  4. Use application methods that minimize drift to the adjacent habitat,



5. The planted habitat areas must be regularly inspected for invasive and/or noxious plants or other plants that may compromise the purpose of this enhancement. Undesirable species should be controlled using the method least damaging method.
6. If habitat is part of an organic farming operation, only materials allowed according to the USDA National Organic Program's National List of Allowed and Prohibited Substances may be used.

### **Adoption Requirements**

This enhancement is considered adopted when pollinator or beneficial habitat has been established that meet or exceed the above criteria, respectively, and the established habitat are maintained and functioning as intended.

### **Documentation Requirements**

1. A map showing the location and dimension of the habitat areas
2. A list of pollinator or beneficial species planted
3. List of maintenance activities carried out to manage the habitat areas

### **North Dakota Requirements**

Per N.D. pollinator fact sheet, rangeland cannot be planted to pollinator habitat. A certified technical service provider (TSP) is required to develop and implement the prescribed burn plan. See job sheet for PLT15 for list of beneficial insects and recommended plants.

## WHAT ARE POLLINATORS AND WHY SHOULD YOU CARE?

The majority of pollinators in North Dakota are insects such as native bees, honey bees, beetles, flies, moths, and butterflies. Through the process of foraging, both native and non-native pollinators provide pollinating services to many native flowering plants.

*Perennial* plants such as flowering shrubs, legumes, forbs, and wildflowers provide consistent foraging habitat during the spring, summer, and fall. *Annual* plants, such as certain commodity and produce crops, provide foraging opportunities. Of animal pollinators, bees are considered to be the most important group. Pollen, usually moistened with nectar or floral oil, is used to feed larvae, and nectar is used to fuel the flight of adults. Many bees are active above ground as adults for only a few weeks or months. Bees require a reliable protein source (pollen) during their active period, generally late April through early October, to carry the adult and offspring through the winter to the next blooming period.



Most native bees nest underground as solitary individuals. Relatively undisturbed conditions with suitable ground and/or nest structure provide nesting sites. Nesting sites are important because the further the bees must travel the more energy the pollinator uses. If bees travel long distances to a “poor” food source and become stressed, the bees may be more susceptible to environmental factors such as parasites and disease resulting in possible starvation or possible reproductive decline. The average foraging distance for native bees ranges from approximately 50 feet to one-half mile while non-native pollinators, such as the European honey bee, range up to several miles from the colony.

## WHERE DO YOU START?

The Natural Resources Conservation Service (NRCS), in cooperation with its partners, has developed two publications to assist landowners. These publications are titled “Farming for Pollinators” and “Farming for Bees: Guidelines for Providing Native Bee Habitat on Farms.” These publications are available at your local United States Department of Agriculture Service Center NRCS office or download at [www.xerces.org](http://www.xerces.org). NRCS also has information on pollinators at the following websites: <http://www.nrcs.usda.gov/feature/pollinators.html> and <http://www.whmi.nrcs.usda.gov/technical/leaflet.htm#M>

The publications recommend three initial landowner actions:

- Recognize the pollinators and pollinator habitats that are already on your property.
- Adapt existing production and land management practices to avoid causing undue harm to the pollinators already present.
- Provide habitat for native pollinators on and around the farm.

### **WHAT CAN YOU DO?**

Methods are available for providing or protecting nest site habitats for bees in the agricultural landscape; many of them do not interfere with farming. They range from simple, low-cost measures to more complex and expensive methods:

- Provide undisturbed habitat by focusing on areas that are not farmed, including:
  - Unused land around fields, buildings, and service yards.
  - Areas more difficult to farm, such as edges of ditches, ponds and riparian areas, on hills, or around utility poles.
- Management of irrigation to preserve ground-nesting pollinators. By using drip or spray irrigation instead of flooding, producers can avoid drowning ground-nesting pollinators and larvae. Irrigating can also be performed at night to minimize interference with bee activity.
- Minimize tillage to protect existing pollinator nests. By tilling shallow or using no-till agriculture, disturbance of nest sites can be avoided. For example, producers found three times more pollinators on squash and pumpkin farms that practice no-till agriculture than that of tilled farms.
- Active land management to provide nesting sites for pollinators, including:
  - Creating patches of bare ground within perennial plantings (a range of native plants blooming at different times during the spring, summer, and fall).
  - Leaving dead wood and standing snags, drilling holes in dead wood, and putting out trap nests for twig nesting pollinators.
  - Providing a sand-loam mix for ground-nesting pollinators.
  - Putting out bumble bee nest boxes buried or above ground.

### **HOW DO PESTICIDES AFFECT POLLINATORS?**

Insecticides are differentially toxic to non-target species, depending on the active ingredients, the strength and composition of the formulation (dust, powder, liquid), and the behavioral and physiological response of the target insect. Some pollinator species might not be killed outright by pesticide applications, but they could suffer sublethal effects, including reduced foraging ability that ultimately hampers their productivity.

Short of eliminating insecticide use altogether, producers can reduce risks to pollinators from pesticides in several ways:

- Choose appropriate pesticides. Some insecticides have active ingredients that are less likely to cause mortality or sublethal effects in pollinators (for example, granular powders are less noxious than dust), and break down more rapidly. Microencapsulated formulations should be avoided because they become trapped in a bee's transporting hairs and carried back to the nest.
- Apply pesticides selectively. Producers may be able to avoid using insecticides during a crop's bloom period - or apply them at night while pollinators are in nests, and apply them on the ground rather than in aerial spray.
- Convert some or all fields to organic production.
- Keep in mind that some organic insecticides can be harmful to pollinators.

### **PLANTINGS FOR POLLINATORS**

Native plantings are preferred. Native grasses along with planting blocks of flowering forb species can provide foraging sites for native pollinators and honeybees. When designing a planting to benefit pollinators, season-long blooming plants should be your goal. For herbaceous plantings, select at least three forb species from each bloom period. The plantings can be entirely forbs, or forbs can be seeded with grasses for grazing to enhance nest habitat for pollinator species. The following table lists bloom times for native and introduced forb and shrub and tree species adapted for North Dakota. Only two woody species have a late bloom period. For woody plantings, a middle bloom period may be used instead of a third late bloom period species.

Managing your pollinator habitat will take some extra effort. Noxious weeds may become a treat along with tree and shrub invasion. Spot spaying for noxious weeds and invasive trees will be needed to help maintain the pollinator habitat. Some forbs are more tolerant to chemical than others. Review herbicide labels to help determine forb tolerance.

## North Dakota Pollinator Plants

Native Forbs					
<i>Early April – June 15</i>	<i>Full Seed PLS lb/ac</i>	<i>Middle June 15 - July</i>	<i>Full Seed PLS lb/ac</i>	<i>Late August - October</i>	<i>Full Seed PLS lb/ac</i>
American vetch (VIAM)	36.0	Black-eyed Susan (RUHI2)	0.8	Blue aster (SYLAL3)	1.5
Black-eyed Susan (RUHI2)	0.8	Blanketflower (GAAR)	7.0	Blue vervain (verbena) (VEHA2)	1.0
Canada anemone (ANCA8)	10.0	Butterfly milkweed (ASTU)	16.2	Butterfly milkweed (ASTU)	16.2
Columbine (AQCA)	3.0	Canada goldenrod (SOCA6)	0.2	Canada goldenrod (SOCA6)	1.4
Evening primrose (OEBI)	0.8	Canada milkvetch (ASCAC6)	4.0	Cup plant (SIPE2)	19.0
Golden Alexander (ZIAU)	6.2	Canada tickclover (DECA7)	12.3	Dotted gayfeather (LIPU)	8.0
Lewis flax (blue) (LILE3)	3.8	Culvers root (VEVI4)	0.1	False boneset (EUPE3)	0.4
Plains coreopsis (COTI3)	0.7	Dotted gayfeather (LIPU)	8.0	Fragrant giant hyssop (ADAST)	0.8
Prairie phlox (PHPI)	4.0	False sunflower (HEHES)	18.0	Grayhead coneflower (RAPI)	1.7
Rocky Mountain Bee Plant (CLSE)	20.0	Heath aster (SYER)	0.4	Hoary Vervain (VEST)	2.4
Shell-leaf penstemon (PEGR7)	4.0	Illinois Bundleflower (DEIL)	8.0	Ironweed (VEFA2)	2.8
Silvery lupine (LUAR3)	8	Joe Pye weed (EUMAB)	0.7	Joe Pye weed (EUMAB)	0.7
Spiderwort (TROC)	7.0	Missouri goldenrod (SOMI2)	0.5	Maximilian sunflower (HEMA2)	1.0
Western yarrow (ACMIO)	0.4	Narrow-leaved purple coneflower (ECAN2)	9.0	Missouri goldenrod (SOMI2)	0.5
		Prairie Onion (ALST)	6.2	New England Aster (SYNO2)	0.8
		Purple coneflower (ECPU)	9.0	Purple coneflower (ECPU)	9.0
		Purple meadow rue (THDA)	6.2	Sneezeweed (HEAU)	0.4
		Purple prairieclover (DAPU5)	3.8	Stiff goldenrod (SORI2)	1.4
		Scarlet globemallow (SPCO)	3.9	Stiff sunflower (HEPAS)	2.5
		Silvery lupine (LUAR3)	8.0	Swamp milkweed (ASIN)	15.0
		Spiderwort (TRBR)	7.0	Thickspike Gayfeather (LIRY)	8.0
		Stiff goldenrod (SORI2)	1.4	Wild bergamot (MOFI)	0.9
		Stiff sunflower (HEPAS)	2.5		
		Swamp milkweed (ASIN)	15.0		
		Thickspike Gayfeather (LIRY)	8		
		Western yarrow (ACMIO)	0.4		
		White prairieclover (DAAL)	3.9		
		Wild bergamot (MOFI)	0.9		
		Yellow coneflower (RACO3)	1.5		

Introduced Forbs		
Alfalfa	6.0	
Sainfoin	35.0	
Shrubs (early*, middle** and late***) <b>bold denotes introduced species</b>		
American highbush cranberry	American plum*	Buffaloberry*
<b>Caragana*</b>	Chokeberry**	Chokecherry*
Elderberry*	False indigo**	Golden currant*
Juneberry*	Lilac*	Leadplant**
Missouri willow*	<b>Mongolian cherry*</b>	<b>Nanking cherry*</b>
Potentilla** ***	Prairie rose*	Redosier dogwood*
<b>Russian almond*</b>	Sandbar willow*	Sandcherry*
Silverberry**	Skunkbush sumac*	Western snowberry*
Woods rose*	Smooth sumac**	
Trees (early*, middle**, and late***)		
<b>Apricot*</b>	Basswood/Linden ***	Bebb willow*
<b>Crabapple*</b>	<b>Harbin pear*</b>	Hawthorn
Peachleaf willow*		

<b>Pollinator Mixes</b>				
<b>Restoration and Management Rare and Declining Habitat - 643 - Range Seeding 550</b>				
<b>Tall Grass Prairie</b>				
Example mixes for sites such as loamy (silty), loamy overflow (overflow), sub irrigated, clayey, wet meadow				
	<b>Percentage</b>	<b>PLS/AC</b>	<b>PLS/Mix</b>	<b>Bloom period</b>
Big bluestem	10%	7.5	0.75	
Indiangrass	5%	7.0	0.35	
Switchgrass	10%	4.5	0.45	
Green needlegrass	10%	7.5	0.75	
Western wheatgrass	5%	10.0	0.50	
Little bluestem	5%	4.5	0.23	
Sideoats grama	5%	7.5	0.38	
Canada wildrye	5%	7.5	0.38	
Blue grama	5%	2.5	0.13	
Maximilian sunflower	3%	1.0	0.03	l
Purple prairieclover	9%	3.8	0.34	m
Canada milkvetch	4%	4.0	0.16	m
Leadplant	1%	6.0	0.06	l
Purple coneflower	5%	3.8	0.19	l
Lewis blue flax	8%	3.8	0.3	e
Western yarrow	4%	0.4	0.02	e
American vetch	2%	36.0	0.72	e
Black-eyed Susan	4%	0.8	0.03	m
	<b>100%</b>			
<b>Mixed Grass Prairie</b>				
Example Mixes for sites such as loam (silty), thin loamy (thin upland), loamy overflow (overflow) clayey				
	<b>Percentage</b>	<b>PLS/AC</b>	<b>PLS/Mix</b>	<b>Bloom period</b>
Big bluestem	5%	7.5	0.38	
Green needlegrass	15%	7.5	1.13	
Western wheatgrass	5%	10.0	0.5	
Little bluestem	10%	4.5	0.45	
Sideoats grama	13%	7.5	0.98	
Canada wildrye	5%	7.5	0.38	
Blue grama	5%	2.5	0.13	
Maximilian sunflower	3%	1.0	0.03	l
Purple prairieclover	9%	3.8	0.34	m
Yellow coneflower	3%	1.5	0.05	m
Black-eyed Susan	6%	0.8	0.05	m
Lewis blue flax	10%	3.8	0.38	e
Western yarrow	4%	0.4	0.02	e
American vetch	2%	36.0	0.72	e
Leadplant	1%	6.0	0.06	l
Purple coneflower	4%	9.0	0.36	l
	<b>100%</b>			

<b>Mixed Grass Prairie</b>				
Example mixes for sites such as saline lowland, claypan and thin claypan and closed depression				
	<b>Percentage</b>	<b>PLS/AC</b>	<b>PLS/Mix</b>	<b>Bloom period</b>
Slender wheatgrass	15%	5.5	0.83	
Western wheatgrass	13%	10.0	1.30	
Beardless wildrye	8%	8.5	0.68	
Switchgrass	8%	4.5	0.36	
Prairie cordgrass	5%	7.0	0.35	
Little bluestem	5%	4.5	0.23	
Big bluestem	5%	7.5	0.38	
Green needlegrass	5%	7.5	0.38	
Maximilian sunflower	3%	1.0	0.03	l
Western yarrow	2%	0.4	0.01	e
Blue aster	3%	1.5	0.05	l
Four-winged saltbush	4%	6.0	0.24	m
Blanketflower	4%	7.0	0.28	m
Lewis blue flax	5%	3.8	0.19	e
Black-eyed Susan	5%	0.8	0.04	e
Yellow coneflower	5%	1.5	0.075	m
Canada goldenrod	5%	0.2	.01	l
	<b>100%</b>			
<b>Mixed Grass Prairie</b>				
Example mixes for sites such as sands, sandy, shallow-to-gravel, and shallow.				
	<b>Percentage</b>	<b>PLS/AC</b>	<b>PLS/Mix</b>	<b>Bloom period</b>
Blue grama	10%	2.5	0.25	
Canada wildrye	10%	7.5	0.75	
Little bluestem	10%	4.5	0.45	
Prairie sandreed	5%	5.0	0.25	
Sand bluestem	5%	12.0	0.60	
Sideoats grama	13%	7.5	0.98	
Western wheatgrass	5%	10.0	0.5	
Green needlegrass	10%	7.5	0.75	
Dotted gayfeather	2%	8.0	0.16	l
False boneset	5%	0.4	0.02	l
Yellow coneflower	2%	1.5	0.03	m
Purple coneflower	3%	9.0	0.27	m
Purple prairieclover	8%	3.8	0.30	m
Shell-leaf penstemon	2%	4.0	0.08	e
Stiff sunflower	2%	2.5	0.05	l
Lewis blue flax	5%	3.8	0.19	e
Western yarrow	3%	0.4	0.012	e
	<b>100%</b>			

<b>Example for Pollinator Only Species Plantings – 643 – Restoration and Management of Rare and Declining Habitats</b>				
	<i>Percentage</i>	<i>PLS/AC</i>	<i>PLS/Mix</i>	<i>Bloom period</i>
Blue flax	15%	3.8	0.57	e
American vetch	5%	36	1.8	e
Western yarrow	5%	.4	.02	e
Black-eyed Susan	15%	0.8	0.12	m
Purple prairie clover	20%	3.8	0.76	m
False sunflower	10%	18	1.8	m
Maximilian sunflower	5%	1	0.05	l
Purple coneflower	15%	9	1.35	l
Blue aster	<u>10%</u>	1.5	.15	l
	<b>100%</b>			