

# TECHNICAL NOTES

STATE OFFICE

STILLWATER, OKLAHOMA 74074

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ECOLOGICAL SCIENCES TECHNICAL REFERENCES

FOR IN-SERVICE USE ONLY

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BIOLOGY OK-33 (Rev.)

July 26, 2010

RE: Establishing Flowering Plants for Pollinator Habitat Areas.

This revision provides supplemental information on the establishment and management of pollinator plants, changes the seeding rates for pollinator plantings, and clarifies that designated pollinator habitat areas are to be planted exclusively to pollinator plants, rather than included as a component of native grass seed mixtures. When the intent is to merely supplement a native grass seed mixture with pollinator friendly forbs and legumes, refer to the Range Seeding (550) standard for guidance. Use this Technical Note for guidance when selecting, establishing and managing flowering plants specifically for pollinator habitat areas.

It should also be noted that the recommendations included in this document do not necessarily meet the requirements of specific Farm Bill program options which offer cost-share and/or enhancement payments for establishment of pollinator habitat areas (i.e. CSP Wildlife Enhancement Activity for Pollinator Areas and CRP Pollinator Friendly Habitat). Refer to the specific requirements of the subject conservation program in order to insure that all program criteria are met.

Plants and plant mixtures used to establish pollinator habitat areas should be selected from the list included in this Technical Note. However, the list does not include all possible plants that have pollinator value. Please submit any requests for inclusion of additional plants to the State Resource Conservationist for technical review and listing consideration. Plant species that are adapted to the region and provide recognized pollinator benefits will be added to the list.

*/s/ Gary O'Neill*                      *acting for*

RONALD L. HILLIARD  
State Conservationist

DIST: AO

## Guidance for Establishing Pollinator Habitat Areas

### General

Plantings for pollinator habitat should include a combination of numerous plant species having variable flower colors, odors, flower structures, and bloom periods. A diverse assemblage of plants with as many species as possible will attract a wide array of pollinators and extend the availability of pollinator habitat throughout the growing season.

### Minimum Plant Species Requirements

As a minimum, 9 flowering plant species should be planted of which one-third should be represented by early season flowering plants, one-third by mid season flowering plants and one-third by late season flowering plants. The table on pages 4 and 5 of this document lists several common Oklahoma flowering plants that are used by pollinators and identifies the plants by the primary blooming period. Note that several plants are listed in multiple seasons because of overlap in blooming periods and/or because the plants have relatively long flowering periods. The list is not all inclusive and if there are additional plants that the field office staff would like to recommend for planting, contact the State Resource Conservationist for listing consideration.

### Allowable Plant Species

Plantings should be comprised of native plant species. With the exception of alfalfa and sweetclover, all of the plants on the list meet this requirement. These two non-native species have been added because of their high value as pollinator plants and commercial availability. When used, alfalfa and sweetclover can each comprise up to 5 percent of the planting mixture.

### Seeding Rates

A general guide for planting wildflowers and other flowering plants for pollinators is to assume a full seeding rate of approximately 6 pounds pure live seed (PLS) per acre or approximately 9 bulk pounds of seed per acre. This seeding rate will result in approximately 60 to 70 seeds per square foot. Refer to the examples below for calculating seeding mixtures based on this rate:

Example 1: Planting 9 native flowering plant species in a mixture, in equal proportions of approximately 11.1 percent, will require approximately .67 pounds of PLS seed per acre for each of the 9 species and result in a total planting of approximately 6.0 pounds of PLS seed per acre, which meets the minimum planting recommendation. Refer to the Pasture and Hayland Planting (512) standard for information on calculating PLS.

Example 2: Planting 11 species in the mixture where 9 native flowering plant species are planted in equal proportions of 10 percent and 2 introduced species (alfalfa and sweetclover) are planted at 5 percent each would require 0.6 pounds of PLS seed per acre for each of the 9 native species (5.4 pounds subtotal) and 0.3 pounds PLS per acre for each of the two introduced species (0.6 pounds subtotal). The total planting would be 5.4 pounds PLS of native plant seed plus 0.6 pounds of non-native plant seed for a total of 6.0 pounds PLS per acre. Once again, this amount of seed meets the minimum planting recommendation.

Any other planting combination that includes at least 9 total plant species and does not include more than 5 percent alfalfa or 5 percent sweetclover and results in a total planting of no less than 6.0 pounds PLS per acre would be acceptable.

### Commercial Seed Dealers and Available Mixtures

Many wildflower/pollinator mixes are available commercially. These mixes typically contain more than the minimum number of recommended species and are blended to provide the widest range of colors and bloom periods. Commercial dealers will often mix custom blends that meet the specific needs of a geographic region or targeted pollinator species.

#### Use of Trees and Shrubs for Pollinator Plants

Flowering trees and shrubs may also be planted as part of the recommended number of pollinator species. The list of pollinator plants below includes trees and shrubs having value for pollinators. Refer to the Tree/Shrub Establishment (612) standard for specific guidance on adaptability, site preparation, spacing etc.

#### Size of Habitat Areas and Spacing

In order to provide sustainable habitat, pollinator areas should be at least ½ acre in size. Larger areas will naturally provide more flowering plants, more plant diversity and support more pollinators. Habitat areas should be distributed throughout the landscape. As a general rule one pollinator area per 40 acres of land is recommended.

#### Planting Techniques

Pollinator plants should be planted by using one of the following methods: Method 1 - Broadcast seed onto a clean, well prepared seedbed by hand or by use of a drop or cyclone spreader. A carrier such as dry, clean sand (at a ratio of 1 or 2 parts sand and 1 part seed) can be used to obtain better seed distribution. Lightly rake by hand or drag the area with a harrow or section of chain link fence to cover the seed with no more than ¼ inch soil. Method 2 - Drill the seed into a clean, well prepared seedbed or into ground that has been chemically treated with herbicide to eliminate competing weed cover. Drill the seed to a maximum depth of ¼ inch in order to insure seed germination. Achieving good soil/seed contact is important in establishing plants from seed.

#### Insecticide and Herbicide Restrictions

Insecticides and herbicides are both counterproductive to the purposes for which pollinator habitat areas are established and should not be used on or in close proximity to the areas after planting. No herbicide applications should be made within 25 feet of the outside edge of pollinator areas and chemical drift will be controlled to prevent loss of pollinator habitat. As would be expected, insecticides are particularly harmful to pollinator insects and should not be used within 1/4 mile of a planted pollinator area.

#### Farm Bill Programs and Pollinator Habitat

Several Farm Bill conservation programs include pollinator habitat plantings as an option for cost-share and/or enhancement payments. Many of the recommendations included in this technical note are consistent with the requirements of these programs, but some requirements may be different or more restrictive than the recommendations provided here. Refer to the policy and guidance information applicable to the specific program to insure that the pollinator habitat criteria are met.

### Pollinator Plant List

As stated earlier, a minimum of 9 flowering plant species should be planted of which one-third should be represented by early season flowering plants, one-third by mid season flowering plants and one-third by late season flowering plants. Pre-mixed blends or custom blends that meet the requirements for minimum number of species and flowering seasons are available through commercial dealers.

Early Flowering Season	Mid Season Flowering	Late Flowering Season
<b>Forbs and Legumes</b>	<b>Forbs and Legumes</b>	<b>Forbs and Legumes</b>
Alfalfa	Alfalfa	Alfalfa
Blue Wild Indigo	Ashy Sunflower	Asters
Buttercup	Awnless Bush Sunflower	Ashy Sunflower
Engelmann Daisy	Baldwin Ironweed	Awnless Bush Sunflower
Evening Primrose	Basket Flower	Baldwin Ironweed
Half Shrub Sundrop	Black-eyed Susan	Blazing Star
Indian Paintbrush	Black Sampson	Boneset
Penstemon	Blazing Star	Butterfly Milkweed
Plains Coreopsis	Blue Wild Indigo	Cardinal Flower
Tephrosia	Boneset	Compass Plant
Thistle (Cirsium)	Butterfly Milkweed	Daisy Fleabane
Verbena (Vervain)	Cardinal Flower	Dotted Gayfeather
Yarrow	Compass Plant	Evening Primrose
Yellow Wild Indigo	Daisy Fleabane	Goldenrod
	Dotted Gayfeather	Illinois Bundleflower
<b>Trees, Shrubs, and Vines</b>	Engelmann Daisy	Ironweed
Blackberry	Evening Primrose	Leavenworth Eryngo
Black Locust	Half Shrub Sundrop	Maximilian Sunflower
Coral Honeysuckle	Hemp Dogbane	Milkweeds
Golden Currant	Illinois Bundleflower	Partridge Pea
Hawthorn	Indian Blanket	Prairie Acacia
Plum	Indian Paintbrush	Purple Prairie Clover
Persimmon	Ironweed	Rosinweed
Redbud	Leadplant	Sweetclover
Rough-leaf Dogwood	Leavenworth Eryngo	Western Indigo
Indigo Bush (Amorpha)	Lemon Monarda (Beebalm)	
	Milkweeds	
	Oxe-eye Daisy	<b>Trees, Shrubs, and Vines</b>
	Pale Echinacea	Trumpet Creeper *
	Partridge Pea	
	Penstemon	
	Pitcher's Sage	
	Plains Coreopsis	
	Prairie Acacia	
	Prairie Coneflower (Mex. Hat)	

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Early Flowering Season	Mid Season Flowering	Late Flowering Season
	Purple Prairie Clover	
	Sweetclover	
	Tephrosia	
	Thistle (Cirsium)	
	Verbena (Vervain)	
	Western Indigo	
	Yarrow	
	Yellow Wild Indigo	
	<b>Trees, Shrubs, and Vines</b>	
	Blackberry	
	Black Locust	
	Coral Honeysuckle	
	Hawthorn	
	Indigo Bush (Amorpha)	
	Persimmon	
	Rough-leaf Dogwood	
	Trumpet Creeper *	
	Golden Currant	
	Western Soapberry	

\* Note: Trumpet creeper spreads aggressively and may need to be controlled or planted in areas away from other desirable plants.