



# Native Pollinators

## Missouri Job Sheet

JS-MO643Pollinator

Natural Resources Conservation Service (NRCS)  
November 2015

Missouri Conservation Practice 643

<b>Landowner/Producer:</b>		<b>Farm #:</b>
<b>Field/Stand(s):</b>	<b>Acres:</b>	<b>Tract #:</b>
<b>Planned By:</b>		<b>County:</b>
<b>Contact Information:</b>		<b>Date:</b>

**PURPOSE:** To provide food, shelter, and nesting resources for pollinator species. This job sheet provides guidance on establishing and maintaining habitat to the primary benefit of animal pollinators.

**General Information:** If you mention the word pollinator, the average person immediately thinks of honey bees. Most people don't know that our common honey bee is actually an import from Europe, arriving on our shores in the 1600's. Fewer still know that the vast majority of Missouri's animal pollinators are native to the state, and that they represent an incredibly important resource for both native and introduced plants. Pollinators in Missouri include bees, butterflies, moths, wasps, flies, beetles, ants and even hummingbirds.

General guidance on lessening pollinator impacts are listed below by land use, along with specific techniques on how to improve habitat. Plantings for pollinators will be comprised of at least nine species, with a minimum of three species blooming in each season (spring, summer, and fall). See Table 1 for blooming periods.

### SPECIFICATIONS:

#### To establish pollinator foraging habitat:

- Locate pollinator habitat where chemical drift will not be a concern.
- Avoid spraying herbicides or insecticides on field borders, filter strips, hedgerows and field windbreaks.
- Select undisturbed areas in full sun with good air circulation.
- Plant diverse herbaceous seeding mixes, giving preference to native species. Areas will be a minimum of 0.5 acre, but larger is better. Select the best site for habitat area on the least erosive portion of the field (narrow strips across the slope if possible); do not install pollinator habitat across areas of concentrated water flow. If planted in strips, plantings must have a minimum

width of 20 feet – and a maximum width of 40 feet; with at least 2 times the planted width between strips.



*Native bee on Black-eyed Susan*



**Conservation of the monarch butterfly is critically important as it represents other pollinators and is experiencing precipitous declines, therefore, it is recommended that at least 1 species of approved milkweed (*Asclepias* spp.) is included in the seed mix (see table 1). Also see the Monarch Habitat Information Sheet (IS-MO643Monarch) for more specific information related to the monarch.**

- ❑ For native forbs/wildflowers, use at least 5.0# PLS/acre, a minimum of 9 species, with a minimum of three species blooming in each season (spring, summer, and fall), with no single species exceeding 15% or comprise less than 1% of the mix, and annuals/biennials (combined) will not exceed 10% of the mix. It is recommended that Missouri Source Identified Class seed is used for pollinator plantings. Refer to Upland Wildlife Habitat Management (645).
  - See Table 1 for blooming periods. Also refer to IS-MO643 Native Forb Information Sheet at [Missouri NRCS Native Forb Information Sheet \(IS-MO643Native Forb\)](#) for details.
  - When possible, manage existing native wildflowers and legumes by controlling undesirable vegetation. Refer to Table 1 or Native Forb Information Sheet (IS-MO643Native Forb) at [Missouri NRCS Native Forb Information Sheet \(IS-MO643Native Forb\)](#) for details.
- ❑ Two introduced legumes (alfalfa and annual lespedeza) are permitted and will not exceed 10% (if combined) of the total seeding rate. If 10% of the mix includes these introduced legumes (0.5 lbs PLS/acre), the amount of forbs and/or native legumes will be reduced to 4.5 lbs PLS/acre.
- ❑ **Dormant seeding of forbs and native legumes is strongly recommended** (see Native Forb Information Sheet (and Table 2 for establishment information)).
- ❑ When using the broadcast seeding method with a forb and legume seed mix, include a seed carrier (milorganite, pellet lime, rice hulls) and thoroughly mix the carrier with the seed to ensure a more even seed distribution.
- ❑ Pollinator habitat establishment will follow the contours of the field as much as possible.
- ❑ Avoid concentrated flow areas. It is recommended that pollinator plots planted in blocks should be a minimum of 100' apart from each other.
- ❑ No fertilizer or soil amendments are required.



*Native bee foraging on purple coneflower*

**To establish pollinator nesting habitat:**

- ❑ Create woody structure by edge feathering or creating downed tree structures.
- ❑ Trees that are edge feathered must be adjacent to the pollinator planting and fall out onto the pollinator planting.



- ❑ Downed tree structures should be placed on the pollinator planting acreage.
- ❑ Woody material for pollinator nesting habitat will equal 1,500 square feet in size.
- ❑ Establish one 1,500 square foot area of woody material per 1 acre of pollinator planting, up to 1 acre in total woody habitat per 40 acres of pollinator plantings. Refer to Upland Wildlife Habitat Management (645).

**MAINTENANCE AND MANAGEMENT RECOMMENDATIONS:**

- ❑ Prescribed burning and **grass-only** herbicide application are the preferred management methods.
- ❑ Keep ground disturbance to a minimum, or disturb 50% or less of pollinator habitat annually.
- ❑ Manage prescribed burning to limit potential negative impacts on native insects—either by burning in the dormant season or by burning only a portion of the area (one-third to one-fourth) at any one time. Try to avoid growing season burns or whole field burns to reduce negative impacts on insect pollinators.
- ❑ Mowing is an inadequate means of disturbance for pollinator habitat, except as needed during establishment or to facilitate a management practice.
- ❑ Removal of competing vegetation is normally carried out for one growing season following establishment. Where applicable, mow as often as necessary during the first growing season to control competing vegetation. Competing vegetation should be cut to a height of 3-6 inches (or above the height of the native seedlings) whenever competing vegetation begins to completely shade the ground. Refer to Table 2 and Native Forb Information Sheet (IS-MO643Native Forb).

**PRIMARY HABITAT CONSIDERATIONS:**

- Implementing no-till farming to reduce disturbance of ground-nesting insects, especially for cropland adjacent to diverse herbaceous or woody cover.
- Reduce or eliminate the use of insecticides. If possible select pesticides that are less toxic to pollinators (for example, liquid forms are generally less toxic than granular powders, which are less noxious than dust) or break down quickly. Avoid microencapsulated formulations, since they mimic pollen. Choose ground applications over aerial spraying. Time spray operations very early or late in the day when pollinators are less active.
- Provide food and cover for native pollinating insects.
- Consult with NRCS or MDC natural resource managers for additional recommendations. Contact University Extension for additional information on wildlife management.

Comment:

I certify that the above information meets NRCS specifications and design and installation.

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NRCS SIGNATUREDATE



## REFERENCES:

The following publications were selected from a listing of documents from USDA's Natural Resources Conservation Service's website, and can be found at <http://plants.usda.gov/pollinators/NRCSdocuments.html>.

[Native Pollinators](#) (PDF; 4730 KB) - Fish and Wildlife Habitat Management Leaflet (U.S.)

[NRCS Pollinator Tech Note TEMPLATE - Xerces](#) (DOC; 647 KB) - Pollinator Conservation Biology Technical Note (U.S.)

[Using Farm Bill Programs for Pollinator Conservation](#) (PDF; 278 KB) - Pollinator Conservation Biology Technical Note (U.S.)

Additional material can be found on NRCS's Plant Materials website at <http://www.plant-materials.nrcs.usda.gov/technical/pollinators.html>

Hilty, John. <http://www.flowervisitors.info/>, *Insect Visitors of Illinois Wildflowers*. Last updated March 25, 2009.

Robertson, Kenneth R. <http://www.inhs.uiuc.edu/~ken/prairietable1.html>, *List of Native Prairie Plants for use Along Roadsides in Illinois*. Illinois Natural History Survey. Retrieved November 10, 2009.

Tallamy, Douglas W. <http://copland.udel.edu/~dtallamy/host/index.html>, *Lepidopteron Ornamental Guide*. Retrieved November 10, 2009.

Tallamy, Douglas W. *Bringing Nature Home: How Native plants Sustain Wildlife in Our Gardens*. TimberPress. Portland, Oregon. 2007.

Vaughn, Mace and Scott Hoffman Black, *Native Pollinators: How to Protect and Enhance Habitat for Native Bees*, *Native Plants Journal* 9(2):80-91, Summer, 2008.

Xerces Society. <http://www.xerces.org/pollinator-conservation/>. Pollinator Conservation website



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**TABLE 1 – AVAILABLE FORBS** - species selection will only be made for the appropriate habitat type based on a planting site evaluation.

<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Alum root	<i>Heuchera richardsonii</i>	DP, MP, G	Sp - Su	Calyx is mainly green, may have cream colored tips.
Anemone, Meadow	<i>Anemone canadensis</i>	WP	1 - LS – Su, showy	
Aster, Aromatic	<i>Symphyotrichum oblongifolius</i>	DP, MP, G	2 - LSu – F, showy	POL, Fragrant, prefers drier sites.
Aster, New England	<i>Symphyotrichum novae-angliae</i>	WP	2 - LSu – F, showy	POL, Prefers wetter sites, leaves clasp the stem,
Aster, Purple daisy	<i>Symphyotrichum patens</i>	S, DP, MP, G	2 - LSu - F	POL
Aster, Silky	<i>Symphyotrichum sericeum</i>	DP, G	2 - LSu – F, showy	POL
Aster, Skyblue	<i>Symphyotrichum oolentangiense</i>	S, DP MP	2 - LSu – F, showy	POL,
Aster, Smooth	<i>Symphyotrichum laevis</i>	S, DP, MP	2 - LSu – F, showy	POL
Aster, White upland	<i>Solidago ptarmicoides</i>	S, MP, DP, G		
Aster, Willowleaf	<i>Symphyotrichum praealtum</i>	WP	LSu – F,	POL, Pale lavender color, likes moist areas,
Barbara’s button	<i>Marshallia caespitosa</i>	DP, MP, WP	1 - LS - ESu	Foliage green through winter.
Bean, Small Fuzzy	<i>Strophostyles leiosperma</i>	DP, MP, S		
Beardtongue	<i>Penstemon digitalis</i>	DP, MP, WP, G	1 - LS – MSu, showy	POL,
Beardtongue, Prairie	<i>Penstemon tubaeflorus</i>	S, DP, MP	1 - LS – MSu, showy	POL
Beardtongue, Purple	<i>Penstemon cobaea</i>	S, DP, G	- LS – ESu, showy	POL,
Beggar tick (A)	<i>Bidens frondosa</i>	WP	2 - Su, showy	Food,
Beggar's lice	<i>Desmodium canescens</i>	S, DP, MP, G	- LS – Su, showy	Legume, food.
Bergamot, Wild	<i>Monarda fistulosa</i>	S, DP, MP, WP, G	- LS – EF, showy	POL, mint
Bergamot, Savanna	<i>Monarda bradburiana</i>	S, DP, G	- LS – EF, showy	POL, mint
Black-eyed Susan (B)	<i>Rudbeckia hirta</i>	S, DP, MP, G	- LS – F, showy	Food,
Black-eyed Susan, Missouri	<i>Rudbeckia missouriensis</i>	DP, G	- ESu – F, showy	Food, blooms for a long period.
Blazing Star, Eastern	<i>Liatris scariosa</i>	S, DP, MP	LSu-EF	POL, blooms during monarch migration.
Blazing star, Prairie	<i>Liatris pycnostachya</i>	DP, MP, WP, G	- MSu – F, showy	POL, blooms during monarch migration.
Blazing star, Glade/Narrow-leaved	<i>Liatris mucronata</i>	S, DP, G	- MSu – F, showy	POL, blooms during monarch migration.
Blazing star, Rough	<i>Liatris aspera</i>	S, DP, G	- MSu – F, showy	POL, blooms during monarch migration.
Blazing star, Squarrosa	<i>Liatris squarrosa</i>	S, DP	- MSu – EF, showy	POL, blooms during monarch migration.
Blazing star, Squarrulosa	<i>Liatris squarrulosa</i>	S, DP, MP, G	MSu – EF, showy	POL, blooms during monarch migration.



<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Blue lobelia	<i>Lobelia siphilitica</i>	WP	MSu – F, showy	POL
Blue-eyed grass	<i>Sisyrinchium campestre</i>	DP	2 - LS - ESu	Resembles grass
Boneset	<i>Eupatorium perfoliatum</i>	WP	MSu - F	POL
Brown-eyed Susan	<i>Rudbeckia triloba</i>	S, WP	Su – F, showy	Food
Bunchflower	<i>Melanthium virginicum</i>	MP, WP, S (Wet)		
Cardinal flower	<i>Lobelia cardinalis</i>	WP	MSu – EF, vivid red, showy	POL
Catchfly, Royal	<i>Silene regia</i>	S, DP, MP	LS – F, showy	Blooms for a long period. Flowers 2 <sup>nd</sup> year.
Clover, Purple prairie	<i>Dalea purpurea</i>	S, DP, MP, G	- LS – Su, showy	POL, legume
Clover, White prairie	<i>Dalea candida</i>	S, DP, MP, G	LS – Su, showy	POL, legume.
Compass Plant	<i>Silphium laciniatum</i>	DP, MP, WP, G	LS – Su, showy	POL, food,
Coneflower, Gray-head	<i>Ratibida pinnata</i>	S, DP, MP, G	LS – F, showy	POL, food, robust perennial. Extensive root system reduces erosion.
Coneflower, Ozark glade	<i>Echinacea simulata</i>	S, DP, MP, G	LS – MSu, showy	POL
Coneflower, Pale purple	<i>Echinacea pallida</i>	S, DP, MP, G	LS – MSu, showy	POL
Coneflower, Prairie	<i>Ratibida columnifera</i>	DP, MP, G	LS – EF, showy	Ray flowers sometimes marked with dark red. Weak perennial on good soil.
Coneflower, Purple	<i>Echinacea purpurea</i>	S, MP, WP, G	LS – F, showy	POL, prolific bloomer, flowers over a long period.
Coneflower, Black-eyed Susan, Sweet	<i>Rudbeckia subtomentosa</i>	MP, WP	2 - Su, showy	Food,
Coneflower, Yellow	<i>Echinacea paradoxa</i>	S, DP, G	LS – ESu, showy	POL
Coreopsis, Lanceleaf	<i>Coreopsis lanceolata</i>	DP, MP, G	LS – MSu, showy	POL, food,
Coreopsis, Finger/Prairie	<i>Coreopsis palmata</i>	S, DP, MP, G	LS – MSu, showy	Food
Coreopsis, Plains (A)	<i>Coreopsis tinctoria</i>	DP, G	Sp – ESu, showy	Food,
Coreopsis, Tickseed/Tall	<i>Coreopsis tripteris</i>	S, DP, MP, WP, G	LS – MSu	Food
Coreopsis, Big flower	<i>Coreopsis grandiflora</i>	DP, MP	LS – MSu, showy	Food
Culver's root	<i>Veronicastrum virginicum</i>	S, MP, WP	2 - Su, showy	POL, Whorled leaves.
Cup plant	<i>Silphium perfoliatum</i>	WP	Su – F, showy	POL
Curly cup gum plant	<i>Grindelia squarrosa</i>	S, DP, MP, G	Su - F	
Dragonhead, Narrow-leaved false	<i>Physostegia angustifolia</i>	S, DP, MP		
Flag, Blue	<i>Iris virginica shrevei</i>	WP	LS – MSu, showy	Forms large colonies
Flag, Copper	<i>Iris fulva</i>	MP, WP	1 - Sp, showy	
Flax, Yellow	<i>Linum medium</i>	DP, MP		
Foxglove, Fascicled false	<i>Agalinis fasciculata</i>	DP, MP		
Gaura, Large-flowered	<i>Gaura longiflora</i>	DP, MP, WP, S		



<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Goat's rue	<i>Tephrosia virginiana</i>	S, DP, MP, G	LS – MSu, showy	Legume, may have pink/cream flowers.
Golden alexander	<i>Zizia aurea</i>	S, DP, MP, WP, G	LS - ESu	Blooms for a long period in the spring.
Goldenrod, Gray	<i>Solidago nemoralis</i>	S, DP, MP, G	LSu - F	POL
Goldenrod, Riddell's	<i>Oligoneuron riddellii</i>	WP	LSu – F, showy	POL
Goldenrod, Rigid/Stiff	<i>Oligoneuron rigida</i>	S, DP, MP, G	LSu – F, showy	POL
Goldenrod, Savanna	<i>Solidago petiolaris</i>	S, DP, G	LSu – F, showy	POL, likes partial shade.
Goldenrod, Showy	<i>Solidago speciosa</i>	S, DP, MP	LSu – EF, showy	POL
Hyacinth , Prairie	<i>Camassia angusta</i>	MP, WP	Sp – ESu, showy	Plant dormant by early summer.
Hyacinth, Wild	<i>Camassia scilloides</i>	S, DP, MP, G		
Illinois bundle flower	<i>Desmanthus illinoensis</i>	MP, WP, G	LS - MSu	Legume
Indian paintbrush (A)	<i>Castilleja coccinea</i>	DP, MP, WP, G	Sp – Su, showy	Can be summer seeding on poor sites with established grass
Indigo, Blue wild	<i>Baptisia australis</i>	S, DP, MP, WP, G	Sp – ESu, showy	POL, legume
Indigo, Cream wild	<i>Baptisia bracteata</i>	S, DP, MP, G	Sp – LS, showy	POL, Legume
Indigo, White wild	<i>Baptisia alba</i>	S, DP, MP, WP, G	LS – MSu, showy	POL, Legume
Ironweed, Missouri	<i>Vernonia missurica</i>	MP, WP	MSu - F	POL
Ironweed, Giant	<i>Vernonia gigantea</i>	S (Wet), WP		
Ironweed, Yellow	<i>Verbesina alternifolia</i>	S, BF, WP		
Leadplant	<i>Amorpha canescens</i>	S, DP, MP, G	LS – Su, showy	POL, legume, somewhat woody
Lespedeza , Slender	<i>Lespedeza virginica</i>	S, DP, MP, G	LS - EF	Legume, food,
Lespedeza hairy	<i>Lespedeza hirta</i>	S, DP, MP, G	LSu – F	Legume, food
Lespedeza, Postrate	<i>Lespedeza procumbens</i>	DP, G		
Lespedeza, Roundhead	<i>Lespedeza capitata</i>	S, DP, MP, G	MSu - F	Legume, food, bloom may be greenish/cream colored
Lespedeza, Violet	<i>Lespedeza violacea</i>	S		
Lousewort/Wood betony	<i>Pedicularis canadensis</i>	S, DP, MP, G	1 - LS	
Milkweed, Butterfly	<i>Asclepias tuberosa</i>	S, DP, MP, G	LS – Su, showy	POL,
Milkweed, Common	<i>Asclepias syriaca</i>	DP, MP, WP		
Milkweed, Marsh/Swamp	<i>Asclepias incarnata</i>	WP	3 - F, showy	POL, milky sap,
Milkweed, Purple	<i>Asclepias purpurascens</i>	S, DP, MP	LS –MSu, showy	POL, milky sap
Milkweed, Spider	<i>Asclepias viridis</i>	DP, MP		
Milkweed, Whorled	<i>Asclepias verticillata</i>	S, DP, MP, G		
Hairy Mountain Mint	<i>Pycnanthemum pilosum</i>	S, DP, MP, WP, G	MSu-F	POL, mint
Mountain mint, Virginia/Common	<i>Pycnanthemum virginianum</i>	WP	2 - Su	POL, mint
Mountain mint , Slender	<i>Pycnanthemum tenuifolium</i>	S, DP, MP, WP, G	LS – Su	POL, Mint, spreads slowly.



<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
New Jersey tea	<i>Ceanothus americanus</i>	S, DP, MP, G	LS – F, showy	POL, Somewhat woody.
Obedient plant	<i>Physostegia virginiana</i>	S, MP, WP, G	MSu – EF, showy	POL, Mint, spreads slowly.
Pea, Partridge (A)	<i>Chamaecrista fasciculata</i>	S, DP, MP, G	Su – F, showy	POL, legume, food.
Pea, Sensitive	<i>Chamaecrista nititans</i>	S		
Petunia, Wild	<i>Ruellia humilis</i>	DP, MP, G	LS - EF	Short
Poppy mallow, Fringed	<i>Callirhoe digitata</i>	DP, MP	MS – LSu, showy	Spindly plant, slender, leafless stems.
Poppy mallow, Purple	<i>Callirhoe involucrata</i>	DP, G	MS – MSu, showy	
Prairie cinquefoil	<i>Drymocallis arguta</i>	DP, MP, G	LS - Su	
Prairie dock	<i>Silphium terebinthinaceum</i>	S, DP, MP, WP, G	Su - F	POL
Prairie parsley	<i>Polytaenia nuttallii</i>	DP, MP, WP	LS - ESu	
Primrose, Evening	<i>Oenothera biennis</i>	MP		
Primrose, Missouri	<i>Oenothera missouriensis</i>	DP,G	LS – MSu, showy	POL
Quinine, Wild	<i>Parthenium integrifolium</i>	S, DP, MP, G	LS - Su	
Rattlebox	<i>Crotalaria sagittalis</i>	DP, G	LS - EF	
Rattlesnake master	<i>Eryngium yuccifolium</i>	S, DP, MP, G	2 - Su	POL, Unique plant
Rose, Pasture	<i>Rosa carolina</i>	DP, MP, S		
Rose, Prairie	<i>Rosa setigera</i>	MP	1 - Sp, showy	POL, Food
Rosinweed	<i>Silphium integrifolium</i>	S, DP, MP, WP, G	Su – F, showy	POL, food,
Sage, Pitchers	<i>Salvia azurea</i>	DP, MP, G	Su – F, showy	
Scurfy pea	<i>Pedimelum tenuiflorum</i>	DP, MP, WP, G	LS – MSu	Legume, food
Seed box	<i>Ludwigia alternifolia</i>	WP		
Senna, Maryland	<i>Senna marilandica</i>	S, MP, WP	MSu – LSu	POL, legume, food.
Sensitive briar	<i>Mimosa nuttalli</i>	S, DP, MP, G	LS – Su, showy	Legume
Shooting star	<i>Dodecatheon meadia</i>	S, DP, G	2 - LS, showy	Plant goes dormant by July 1 <sup>st</sup> .
Skullcap, Downy	<i>Scutellaria incana</i>	S (S. MO), MP		
Snakeroot, Sampson's	<i>Orbexilum pedunculatum</i>	S, MP, WP	LS – MSu	Legume
Spanish needles (A)	<i>Palafoxia callosa</i>	S, DP, G	LSu – F, showy	Tolerates mowing/pruning.
Spiderwort, Ohio	<i>Tradescantia ohiensis</i>	S, DP, MP, WP	LS – F, showy	POL,
Spurge, Flowering	<i>Euphorbia corollata</i>	S, DP, MP, G	LS – F	Milky sap
Sunflower, Ashy	<i>Helianthus mollis</i>	DP, MP, G	MSu – F, showy	POL, food,
Sunflower, Ox-eye/false	<i>Heliopsis helianthoides</i>	S, DP, MP, G	LS – F, showy	Food, blooms over a long period.
Sunflower, Sawtooth	<i>Helianthus grosseserratus</i>	DP, MP, WP, G	MSu – F, showy	POL, food.
Sunflower, Tickseed	<i>Bidens aristosa</i>	MP		
Sunflower, Western	<i>Helianthus occidentalis</i>	DP, MP, G	MSu – F, showy	POL, food, good wildlife structure.
Sunflower, Willowleaf	<i>Helianthus salicifolius</i>	WP, MP, DP		
Sunflower, Wingstem	<i>Verbesina helianthoides</i>	S, DP, MP	LS - Su	
Sunflower, Woodland	<i>Helianthus strumosus</i>	S	MSu – F	POL, food





<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Tick trefoil, Showy	<i>Desmodium canadense</i>	S, DP, MP, WP, G	MSu – LSu, showy	Legume, food,
Verbena, Rose	<i>Glandularia canadensis</i>	S, DP, G		
Vervain, Blue	<i>Verbena hastata</i>	WP	Su - F	POL,
Vervain, Hoary	<i>Verbena stricta</i>	DP, MP		
Vetch, Canada milk	<i>Astragalus Canadensis</i>	MP		
White wingstem	<i>Verbesina virginica</i>	S, BF		
Yarrow	<i>Achillea millefolium</i>	DP, MP	LS - F	

Under the “Common Name” column, A = Annual, B = Biennial, otherwise the plant is a perennial.

\* S = Oak Savanna, DP = Dry Prairie, MP = Mesic Prairie, WP = Wet Prairie, G = Glade

\*\*Blooming dates: In general, Spring (1) = April/May; LS = May; Summer (2) = June—August; ESu = June; MSu = July; LSu = August; Fall (3) = September—early November; EF = September; MF = October; LF = late October—early November

\*\*\*POL – important pollinators, native for food = important for wildlife



White flowers

blue/purple flowers

green flowers

red/orange flowers

yellow flowers

pink/violet flowers



**Table 2. Options for controlling competing vegetation during forb establishment.**

Option	Current Cover	Timing	Method(s)
Single herbicide application	Cropland OR Sparse Grassland	Fall	<p>(This option should not be used when tall fescue or brome is the dominant cover. Two herbicide applications are needed to adequately control these species. Heavy stands of red or ladino clover will also require two treatments)</p> <ol style="list-style-type: none"> <li>For sparse grassland, remove excess vegetation prior to spraying, preferably in late summer or fall (Aug./Sept.) to allow regrowth. Mowing/haying or prescribed burning are the preferred options.</li> <li>Apply herbicide (follow all label instructions) on new growth when it is 4-6 inches in height and actively growing.               <ul style="list-style-type: none"> <li>-apply 1.5 quarts of glyphosate. This may be tank mixed with imazapic, but be sure that forbs to be planted are tolerant according to the product label. Spray while undesirable vegetation is actively growing.</li> <li>-for cropland, spray winter annuals prior to March 15<sup>th</sup> in south Missouri, April 1<sup>st</sup> in north Missouri, but prior to native forb seedling emergence.</li> </ul> </li> </ol>
Two herbicide applications	Non-desirable grassland	Fall and Spring	<p><b>Option 1</b>            Step 1. Remove excess vegetation in early spring (March).            Step 2. Apply 1 to 2 quarts herbicide (glyphosate, follow all label instructions) on new growth when it is 4-6 inches in height and actively growing.</p> <p><b>AND</b>            Step 3. Apply herbicide (1.5 quarts of glyphosate, follow all label instructions) in fall (Sept.—Oct.) when grass is actively growing.           <ul style="list-style-type: none"> <li>Subsequent applications of glyphosate or a grass-specific herbicide may be necessary in future years to knock back invading undesirable cool-season grasses, see footnotes below for more information.</li> </ul>           Step 4. Dormant seed native forbs and grasses.</p> <p><b>Option 2</b>            Step 1. Begin with a fall glyphosate application (1.5 quarts of glyphosate, follow all label instructions), prior to November 1.            Step 2. Then dormant seed native forbs.            Step 3. A follow-up herbicide application is required, preferably in either spring with a grass-specific herbicide before April 15 (follow all label instructions) or a fall application of glyphosate after the native plants go dormant.</p> <p><b>Option 3</b>            Step 1. Consider glyphosate-tolerant soybeans or forage sorghum for a year or two to eliminate undesirable vegetation.            Step 2. Then dormant seed native forbs and grasses.</p>
Prescribed burn or disking	Desirable native grass	Late Summer or Fall	<ol style="list-style-type: none"> <li>Burn in September—October to suppress existing grass. If there is an abundance of litter present, either burn or disk to expose bare ground prior to seeding (the seedbed must have at least 50 percent bare ground).</li> <li>If there is an abundance of undesirable cool-season grass present (such as fescue), wait until the native grass has gone dormant (usually after the first killing frost) and then spray as outlined above for Cropland or Sparse Grassland.</li> <li>Burning is the preferred option, and forbs may be broadcast during the dormant season by seeding directly onto the remaining ash.</li> </ol>
Prescribed burn or disking	Rank stands of native grass	Late Summer	<ol style="list-style-type: none"> <li>Prescribed burning in late summer (August—September, earlier the better) can be used alone or in conjunction with mowing/haying or disking provided, enough fuel remains to conduct a hot burn and set back the grass (the seedbed must have at least 50 percent bare ground). Continue frequent mowing throughout the 1<sup>st</sup> growing season following seeding.</li> </ol>



**Table 2, continued. Options for controlling competing, non-desirable vegetation during forb establishment.**

Contact your local University of Missouri Extension office, or local herbicide dealer for recommendations on type of herbicide and rates for your specific situation. NRCS does not endorse any particular herbicide product. Be sure and follow all label directions. Take care that the timing of the use of a contact herbicide, such as a glyphosate, occurs after desirable plants are dormant in the fall, or prior to their beginning growth in the spring. Remember that native cool season grasses (such as wildrye) and some forbs (such as beardtongue) may not go dormant. In general, spraying to control undesirable cool-season grasses should take place before October 31.

Note that an adequate seedbed for native forb establishment will have at least 50 percent bare ground. Prescribed burning is the preferred method for seedbed preparation when establishing forbs into an existing grass stand. **Dormant seeding of forbs and native legumes is strongly recommended.**

**Mowing for weed control the establishment year is important**, especially for forbs established into existing grass. Research has shown repeated mowing in the establishment year results in better forb establishment and persistence in existing native grass.

When using glyphosate or grass-specific herbicides (sethoxydim, quizalofop p-ethyl, or clethodim) timing is critical. Glyphosate is a contact killer, and its use may harm or kill desirable forbs. Timing should be late fall/early winter after natives have gone dormant. Spray during warm days (50-60 degrees) with low label rates. Use of grass-specific herbicides should be timed in early spring prior to native grass breaking dormancy.