

BIOLOGY TECHNICAL NOTE

Creating Habitat for Pollinator Insects

Two-thirds of the world's crop species depend on insects for pollination, which accounts for 15 to 30 percent of the food and beverages we consume. Pollinators are key to the function of many terrestrial eco-systems because they enhance native plant reproduction. In turn, native plants provide food and cover for pollinators and numerous other wildlife species and livestock, help stabilize the soil and improve water quality.

In Montana, many species of insects, as well as some birds, provide pollination services. There are 4,000 species of bees alone in North America. The non-native honey bee is the best known of these. Bees are the most efficient and important pollinator group.

Pollinators are threatened worldwide by habitat loss and fragmentation, pesticides, disease, and parasites. This has serious economic implications for humans and for eco-system diversity and stability. Honey bee losses, and resulting rental rates for honey bee pollination services, are on the rise. This makes native bee pollinators all the more important if crop production levels are to be maintained over the long run. Native pollinators are increasingly important as the number and acreage of crops dependent on insect pollination services are steadily growing.

The Natural Resources Conservation Service (NRCS) can help landowners develop and enhance pollinator habitat by encouraging them to establish an array of plants that flower throughout the entire growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting.

Herbaceous plantings should include one bunchgrass adapted to the site and **at least one different forb or shrub species from each of the three flowering categories**, early, mid, and late which are listed below in Tables 1-6. *Grasses should not exceed 20% of the mixture due to the competitive advantage grasses have over the flowering plant species.* Slender wheatgrass should not exceed 5% of any mix. Example seed mixtures emphasizing pollinator-friendly plants are on Pages 2-10, the Conservation Reserve Program (CRP) Guidelines for Pollinators are on Pages 12-13, and the Honey Bee Pollinator Initiative Guidelines (HBPI) on Page 13 of this Technical Note. This Technical Note is intended to be used along with Biology Technical Note No. MT-32, Native Pollinators.

Pollinator habitat plantings must remain undisturbed until after the bloom period so that flowers are available as a nectar source to adults and succulent herbage can be utilized by larvae. Maintenance treatments, such as grazing, burning, or haying may be required outside of the flowering period or on one-third or less of the site when pollinators are active. Native and introduced species are generally not compatible in the same planting when sown together but may be well-suited to alternate row plantings. Alfalfa, if used with native species, must be limited to no more than five percent of the seed mixture. Other introduced species, such as small burnet and sainfoin, must be used with caution if planted with native species.

**Example Native Species Mixture Emphasizing Pollinator-Friendly Plants
Northern Rockies***

Genus	Species	Common	PLS #/Acre	% Mixture	Total #PLS/ac
<i>Pseudoroegneria</i>	<i>spicata</i>	Bluebunch wheatgrass	6.0	15	.90
<i>Elymus</i>	<i>trachycaulus</i>	Slender wheatgrass	6.0	5	.30
<i>Penstemon</i>	<i>eriantherus</i>	Fuzzy-tongue p.	1.5	25	.36
<i>Linum</i>	<i>lewisii</i>	Lewis flax	3.0	25	.75
<i>Gaillardia</i>	<i>aristata</i>	Blanketflower	7.0	25	1.75
<i>Achillea</i>	<i>millefolium</i>	Yarrow (competitive- keep rate low)	.50	5	.025
				100%	
				TOTAL	4.085

**Example Native Species Mixture Emphasizing Pollinator-Friendly Plants
Eastern Plains***

Genus	Species	Common	PLS #/Acre	% Mixture	Total #PLS/ac
<i>Pascopyrum</i>	<i>smithii</i>	Western wheatgrass	8.0	10	0.80
<i>Nassella</i>	<i>viridula</i>	Green Needlegrass	5.0	10	0.50
<i>Dalea</i>	<i>candida</i>	White prairie clover	3.0	25	0.75
<i>Linum</i>	<i>lewisii</i>	Lewis flax	3.7	15	0.56
<i>Ratibida</i>	<i>columnifera</i>	Prairie coneflower	2.0	20	0.40
<i>Liatris</i>	<i>punctata</i>	Dotted gayfeather	7.5	20	1.50
				100%	
				TOTAL	4.51

**Example Introduced Species Mixture Emphasizing Pollinator-Friendly Plants
Statewide***

Genus	Species	Common	PLS #/Acre	% Mixture	Total #PLS/ac
<i>Thinopyrum</i>	<i>intermedium</i>	Pubescent wheatgrass	10.0	20	2.0
<i>Onobrychis</i>	<i>viciifolia</i>	Sainfoin	34.0	25	8.5
<i>Sanguisorba</i>	<i>minor</i>	Small burnet	15.0	25	3.75
<i>Lotus</i>	<i>corniculatus</i>	Birdsfoot trefoil	3.0	30	0.90
				100%	
				TOTAL	15.15

***Note: These seed mixtures are intended for working lands (hay/pasture/range). Such seedings contracted for pollinator conservation must have at least ½-acre left undisturbed until after the first frost in the fall. The undisturbed acres may be part of a haying/grazing rotation.**

Table 1. Pollinator-Friendly Native Shrub Species and Bloom Periods

Common Name	Scientific Name	Preferred Selection	Full Seeding PLS	Bloom Period Start				Bloom Period End				Availability ^{1/}	Relative Cost ^{2/}
				April	May	June	July	Aug	Sept	Oct			
Native Shrubs				Early			Middle		Late				
American plum	<i>Prunus americana</i>		Plugs								E	L	
Antelope bitterbrush	<i>Purshia tridentata</i>										G	M	
Black hawthorn	<i>Crataegus douglasii</i>		Plugs								G	L	
Common chokecherry	<i>Prunus virginiana</i>		Plugs								E	L	
Common snowberry	<i>Symphoricarpos albus</i>										E	L	
Douglas spirea	<i>Spiraea douglasii</i>										F-G	M	
Elderberry	<i>Sambucus canadensis</i>		Plugs								E	L	
Golden currant	<i>Ribes aureum</i>		Plugs								E	L	
Green rabbitbrush	<i>Chrysothamnus viscidiflorus</i>		Plugs								E	L	
Ninebark	<i>Physocarpus malvaceus</i>		Plugs								E	L	
Red-osier dogwood	<i>Cornus sericea</i>										E	L	
Rubber rabbitbrush	<i>Ericameria nauseosa</i>										E	L	
Serviceberry/Juneberry	<i>Amelanchier alnifolia</i>		Plugs								E	L	
Shrubby cinquefoil	<i>Dasiphora fruticosa</i>										E	L	
Silver buffaloberry	<i>Shepherdia argentea</i>	Sakakawea	Plugs								E	L	
Silverberry	<i>Elaeagnus commutata</i>		Plugs								E	L	
Skunkbush sumac	<i>Rhus trilobata</i>	Bighorn	Plugs								E	L	
Western sand-cherry	<i>Prunus pumila</i>		Plugs								G	L-M	
Western Snowberry	<i>Symphoricarpos occidentalis</i>	Trapper	Plugs								E	L	
Willow	<i>Salix species</i>	Common	Cuttings								E	L	
Woods' Rose	<i>Rosa woodsii</i>		Plugs								E	L	

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

Table 2. Pollinator-Friendly Native Forb and Legume Species and Bloom Periods

Common Name	Scientific Name	Preferred Selection	Full Seeding PLS	Bloom Period Start				Bloom Period End				Availability ^{1/}	Relative Cost ^{2/}
				April	May	June	July	Aug	Sept	Oct			
Native Forb and Legume Species				Early		Middle	Late						
American vetch	<i>Vicia americana</i>		33.0							E	L		
Black-eyed Susan	<i>Rudbeckia hirta</i>		0.8							E	L		
Blanket flower	<i>Gallardia aristata</i>		5.0							E	L		
Bee-balm or wild bergamot	<i>Monarda fistulosa</i>		1.0							F-G	M-H		
Common or Western yarrow	<i>Achillea millefolium</i>	Great Northern	0.5							E	L-M		
Canada milkvetch	<i>Astragalus canadensis</i>	Sunrise	4.0							E-G	M-H		
Dotted gayfeather	<i>Liatrix punctata</i>		8.0							F	M-H		
Evening (Common) primrose	<i>Oenothera biennis</i>		1.4							E-G	L-M		
Fuzzytongue penstemon	<i>Penstemon eriantherus</i>	Old Works	2.0							F	M		
Goldenrod, Canada	<i>Solidago Canadensis, var salebrosa</i>		0.5							L-F	M-H		
Goldenrod, Gray	<i>Solidago nemoralis</i>		2.0							L-F	M-H		
Goldenrod, Missouri	<i>Solidago missouriensis</i>		1.0							F	M-H		
Hairy Golden (False) Aster	<i>Heterotheca villosa</i>		3.2							F	M		
Leadplant	<i>Amorpha canescens</i>		1.0							F-G	M-H		
Lewis flax	<i>Linum lewisii</i>	Maple, Grove	3.7							E	L		
Maximilian sunflower	<i>Helianthus maximiliani</i>	Medicine Crk	4.5							E	L		

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

Table 2. Pollinator-Friendly Native Forb and Legume Species and Bloom Periods (cont.)

Common Name	Scientific Name	Preferred Selection	Full Seeding PLS	Bloom Period Start				Bloom Period End			Availability ^{1/}	Relative Cost ^{2/}
				April	May	June	July	Aug	Sept	Oct		
Native Forb and Legume Species				Early			Middle	Late				
Milkweed, Common	<i>Asclepias syriaca</i>		17.0							G	M-H	
Milkweed, Swamp	<i>Asclepias incarnata</i>		15.0							G	H	
Milkweed, Showy	<i>Asclepias speciosa</i>		15.0							G	M-H	
Mountain goldenbanner (Golden pea)	<i>Thermopsis montana</i> var. <i>montana</i>		7.3							F-L	M-H	
Narrowleaf penstemon	<i>Penstemon angustifolia</i>		3.5							E-G	M	
New England aster	<i>Symphotrichum novae-angliae</i>		1.4							G	M-H	
Northern sweetvetch	<i>Hedysarum boreale</i>		24.0							F-G	M	
Prairie coneflower	<i>Ratibida columnifera</i>	Stillwater	1.5							E	M	
Prairie spiderwort	<i>Tradescantia occidentalis</i>		7.0							L	H	
Purple coneflower	<i>Echinacea angustifolia</i>		9.0							E	L	
Purple prairie clover	<i>Dalea purpurea</i>	Bismark, Kaneb	3.8							E	L	
Rocky Mountain Beeplant	<i>Cleome serrulata</i>		13.5							F	L-M	
Scarlet globemallow	<i>Sphaeralcea coccinea</i>		2.0							G	M-H	
Shell-leaf penstemon or Beardstongue	<i>Penstemon grandiflorus</i>		4.0							G-F	H	
Silky lupine (see note)	<i>Lupinus sericeus</i>		20							F	H	
Silver lupine (see note)	<i>Lupinus argenteus</i>		8.6							G-F	M	
Silver sweetvetch	<i>Hedysarum boreale</i>		24.0							G-H	M	
Silverleaf phacelia	<i>Phacelia hastata</i>		6.9							L	H	

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

Table 2. Pollinator-Friendly Native Forb and Legume Species and Bloom Periods (cont.)

Common Name	Scientific Name	Preferred Selection	Full Seeding PLS	Bloom Period Start			Bloom Period End				Availability ^{1/}	Relative Cost ^{2/}
				April	May	June	July	Aug	Sept	Oct		
Native Forb and Legume Species				Early			Middle		Late			
Sticky Geranium	<i>Geranium viscosissimum visviscosissimum</i>	Luna, or Lapp	1.4								G	M-H
Stiff goldenrod	<i>Oligoneuron rigidum</i> var. <i>humile</i>		1.4								G	L
Stiff sunflower	<i>Helianthus pauciflorus</i>		12.8								E	L
Sulfur Flower buckwheat	<i>Eriogonum umbellatum</i>		8-10								L	H
Ten-Petal blazing star	<i>Mentzelia decapetala</i>		3.3								L	H
White prairie clover	<i>Dalea candida</i>	Antelope	3.9								G	L-M
Wyoming Indian paintbrush	<i>Castilleja linariifolia</i>		0.3								F	M-H

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

Note: Buckwheat – NRCS does not recommend planting Buckwheat in areas of rotation with or adjacent to wheat production within two growing seasons.

Note: Vetch – NRCS does not recommend planting Vetch in areas of rotation with or adjacent to Pea production within two growing seasons.

Note: Goldenrods have a reputation of being weedy due to their aggressive rhizomatous growth. However, in stable rangeland environments they seldom achieve densities that are problematic.

Note: Poisoning and birth defects can result from the consumption of lupines.

Note: Milkweeds may be toxic to humans and livestock if taken internally.

Table 3. Pollinator-Friendly Introduced Shrub Species and Bloom Periods

Common Name	Scientific Name	Preferred Selection	Full Seeding PLS	Bloom Period Start				Bloom Period End				Availability ^{1/}	Relative Cost ^{2/}
				April	May	June	July	Aug	Sept	Oct			
Introduced Shrubs				Early			Middle		Late				
Nanking cherry	<i>Prunus tomentosa</i>		Plugs								E	L	
Crabapple	<i>Malus sylvestris</i>		Plugs								E	M	
Russian sage	<i>Perovskia atriplicifolia</i>		Plugs								E	M	
Siberian peashrub or Caragana	<i>Caragana arborescens</i>	Pendula, Lorbergii, Walker	Plugs								E	L	

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

Table 4. Pollinator-Friendly Native Grass Species

Common Name	Scientific Name	Preferred Selection	Full Seeding PLS	Bloom Period Start				Bloom Period End				Availability ^{1/}	Relative Cost ^{2/}
				April	May	June	July	Aug	Sept	Oct			
Native Grasses ^{3/}				Early			Middle		Late				
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	Goldar, or P7	7.0									E	L
Green needlegrass	<i>Nassella viridula</i>	Lodorm, or Cucharas	6.0									E	L
Slender wheatgrass	<i>Elymus trachycaulus</i>	Copperhead, or Pryor	7.0									E	L
Basin wildrye	<i>Leymus cinereus</i>	Trailhead, or Washoe	7.0									E	L
Little bluestem	<i>Schizachyrium scoparium</i>	Badlands, or Blaze	4.0									E	L
Indian ricegrass	<i>Achnatherum hymenoides</i>	Rimrock, or Nezpar	5.0									E	L

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

^{3/} Grasses are wind-pollinated but do provide a pollen or nectar source for pollinator insects; bunchgrasses provide nesting habitat for Bumble bees and other insects. Basin and Russian wildrye and Tall wheatgrass can shade out forbs, plant separately or at low rates. Slender wheatgrass should not exceed 5% of any mix.

Table 5. Pollinator-Friendly Introduced Grass Species

Common Name	Scientific Name	Preferred Selection	Full Seeding PLS	Bloom Period Start				Bloom Period End				Availability ^{1/}	Relative Cost ^{2/}
				April	May	June	July	Aug	Sept	Oct			
Introduced Grasses ^{3/}				Early			Middle		Late				
Russian wildrye	<i>Psathrostachys juncea</i>											G	L-M
Tall Wheatgrass*	<i>Thinopyrum ponticum</i>											E	L

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

^{3/} Grasses are wind-pollinated but do provide a pollen or nectar source for pollinator insects; bunchgrasses provide nesting habitat for Bumble bees and other insects. Basin and Russian wildrye and Tall wheatgrass can shade out forbs, plant separately or at low rates. Tall Wheatgrass is best used in saline or wet saline sites.

Table 6. Non-Native Pollinator-Friendly Plant Species

Common Name	Scientific Name	Full Seeding PLS	Bloom Period Start					Bloom Period End		Availability ^{1/}	Relative Cost ^{2/}
			April	May	June	July	Aug	Sept	Oct		
Non-Native Species			Early			Middle		Late			
Alfalfa	<i>Medicago sativa</i> L.	5								E	L
Alsike Clover	<i>Trifolium hybridum</i>	1.5								G	L
Birdsfoot Trefoil	<i>Lotus corniculatus</i>	3								E	L
Blue flax	<i>Linum perenne</i>	4								E	L
Common flax	<i>Linum usitatissimum</i> L.	42-50								E	L
Buckwheat (<i>see Note 1</i>)	<i>Fagopyrum esculentum</i> or <i>sagittatum</i>	40-50								E	L
Cicer Milkvetch	<i>Astragalus cicer</i>	8								E	L
Red Clover	<i>Trifolium pretense</i> L.	6								E	L
Rapeseed	<i>Brassica napus</i>	4-8								E	L
Sainfoin	<i>Onobrychis viciifolia</i>	21-34								E	L
Strawberry Clover	<i>Trifolium fragarium</i>	4								M	L-M
Sweet Clover, white‡ (<i>see Note 3</i>)	<i>Melilotus officinalis</i>	4								E	L
Sweet Clover, yellow‡ (<i>see Note 3</i>)	<i>Melilotus alba</i>	4								E	L
Ladino White Clover	<i>Trifolium repens</i>	4								E	L
Canola	<i>Brassica napus</i>	5-8								E	L
Flax	<i>Linum usitatissimum</i> L.	25-30								E	L
Oilseed Rape	<i>Brassica napus</i>	5-8								E	L
Phacelia	<i>Phacelia tanacetifolia</i> Benth	5								E	L
Safflower	<i>Carthamus tinctorius</i> L.	15-30								E	L
Small Burnet	<i>Sanguisorba minor</i>	15								E	L
Yellow Mustard	<i>Brassica</i> sp.	5-8								E	L
Sunflower	<i>Helianthus annuus</i> L.	14 - 21,000 seeds/acre								E	L
Camelina	<i>Camelina sativa</i> (L.) Crantz	3-5								E	L
Vetch (<i>see Note 2</i>)	<i>Melilotus</i> spp.	25-30								E	L

^{1/} Availability: E-Excellent, G-Good, F-Fair, L-Low

^{2/} Relative cost: H-High, M-Medium, L-Low

† Bloom period varies depending on planting dates, species, and environmental conditions.

‡ Will flower year after planting. (*See note for Sweet clover*).

Note 1: Buckwheat – NRCS does not recommend planting Buckwheat in areas of rotation with or adjacent to Wheat production within two calendar years of wheat planting.

Note 2: Vetch – Montana NRCS does not recommend hairy, common, or other vetches as a component in any pollinator or cover crop mix in areas in rotation with or adjacent to lentil production within two growing seasons after planting lentils or other pulse crops because of the potential to contaminate the lentil crop. Montana NRCS will also not recommend vetch in conservation plantings that will be grazed.

Note 3: NRCS recognizes that sweet clover (*Melitus officinalis*) is an important species for honey bee forage. However, due to concerns about invasiveness and potential poisoning of livestock and wildlife (coumarin) especially when hayed, NRCS should limit the recommendation.

Note 4: Perennial species rates from Plant Materials Tech. Note 46, Table 2. Annual species rates (dryland) from MT-340 Specification, Table 4, with exception of phacelia (PMC Bridger estimate).

Table 7. Information for Non-Native Plant Species that Attract and Benefit Honey Bees and Other Pollinators in Montana

Common Name	Scientific Name	Pollinator Comments	Crop Type	Planting Time	Bloom Period †
Alfalfa	<i>Medicago sativa</i> L.	Attractive to honey bees and other pollinators, excellent source of nectar and pollen, cross pollinated by ‘tripping’ cut after flowering is done	Perennial	Spring	Summer - Fall
Alsike Clover	<i>Trifolium hybridum</i>	Attractive to honey bees, bumble bees and to a lesser degree other pollinators	Perennial	Spring	Summer - Fall
Birdsfoot Trefoil	<i>Lotus corniculatus</i>	Attractive to honey bees and bumble bees	Perennial	Spring	Summer - Fall
Cicer Milkvetch	<i>Astragalus cicer</i>	Attractive to honey bees, bumble bees and other pollinators	Perennial	Spring	Summer - Fall
Red Clover	<i>Trifolium pretense</i> L.	Attractive to honey bees and bumble bees	Perennial	Spring	Summer - Fall
Sainfoin	<i>Onobrychis viciaefolia</i>	Very attractive to honey bees	Perennial	Spring	Summer - Fall
White Clover	<i>Trifolium repens</i>	Attractive to honey bees, bumble bees and other pollinators, excellent source of nectar and pollen.	Perennial	Spring	Summer - Fall
Buckwheat (see Note 1)	<i>Fagopyrum esculentum</i> Moench; <i>Fagopyrum sagittatum</i> Gilib	Very attractive to honey bees and to a lesser degree other pollinators	Annual	Late Spring	Late Summer
Canola	<i>Brassica napus</i>	Attractive to honey bees and other pollinators	Annual	Early Spring	Early Summer
Flax	<i>Linum usitatissimum</i> L.	This plant provides marginal pollen and nectar for honey bees and other pollinators	Annual	Early Spring	Early - Late Summer
Oilseed Rape	<i>Brassica napus</i>	Attractive to honey bees and other pollinators	Annual	Early Spring	Early Summer
Phacelia	<i>Phacelia tanacetifolia</i> Benth.	Attractive to honey bees, bumble bees and other pollinators	Annual	Early Spring	Late Summer
Safflower	<i>Carthamus tinctorius</i> L.	Very attractive to honey bees, bumble bees and other pollinators, excellent source of nectar and pollen.	Annual	Early Spring	Late Summer
Yellow Mustard	<i>Brassica</i> sp.	Attractive to honey bees, bumble bees and other pollinators	Annual	Early Spring	Early Summer
Berseem Clover	<i>Trifolium alexandrinum</i> L.	Attractive to honey bees and other pollinators	Annual	Early Spring	Summer - Fall
Sunflower	<i>Helianthus annuus</i> L.	Attractive to honey bees, bumble bees, wild bees, and other pollinators	Annual	Late Spring	Late Summer
Camelina	<i>Camelina sativa</i> (L.) Crantz	Attractive to honey bees and other pollinators when more desirable plants are missing	Annual	Early Spring	Early Summer
Sweet Clover (see Note 3)	<i>Melilotus</i> spp.	Attractive to honey bees and pollinators, excellent source of nectar and pollen	Biennial	Early Spring	Summer - Fall
Vetch (see Note 2)	<i>Melilotus</i> spp.	Attractive to bumble bees and other pollinators	Annual/Biennial	Early Spring	Summer - Fall

† Bloom period varies depending on planting dates, species, and environmental conditions.

Note 1: Buckwheat – NRCS does not recommend planting Buckwheat in areas of rotation with or adjacent to Wheat production within two calendar years of wheat planting.

Note 2: Vetch – Montana NRCS does not recommend hairy, common, or other vetches as a component in any pollinator or cover crop mix in areas in rotation with or adjacent to lentil production within two growing seasons after planting lentils or other pulse crops because of the potential to contaminate the lentil crop. Montana NRCS will also not recommend vetch in conservation plantings that will be grazed.

Note 3: NRCS recognizes that sweet clover (*Melilotus officinalis*) is an important species for honey bee forage. However, due to concerns about invasiveness and potential poisoning of livestock and wildlife (coumarin), especially when hayed, NRCS should limit the recommendation.

Example native seed mixture to be established specifically for pollinator habitat – there is no minimum size for these plantings unless contracted for CRP (see CRP Pollinator Guidelines, below). These seedlings/plantings must be undisturbed until after the first fall frost.

Genus	Species	Common	PLS #/Acre	% Mixture	Total #PLS
<i>Achillea</i>	<i>millefolium</i>	Western yarrow (E-L)	0.5	5	0.03
<i>Linum</i>	<i>lewisii</i>	Blue flax (E)	5	3.7	0.19
<i>Ribes</i>	<i>aureum</i>	Golden current (E)	Hand	Plant	Containerized
<i>Dalea</i>	<i>purpurea</i>	Purple prairie clover (E-L)	3.8	10	0.38
<i>Gaillardia</i>	<i>aristata</i>	Blanket flower (M)	6.0	10	0.60
<i>Ratibida</i>	<i>columnifera</i>	Prairie coneflower (M-L)	9.0	10	0.90
<i>Liatis</i>	<i>punctata</i>	Dotted gayfeather (M-L)	8.0	10	0.80
<i>Helianthus</i>	<i>maximilianii</i>	Maximilian sunflower (M-L)	4.5	7	0.32
<i>Achnatherum</i>	<i>hymenoides</i>	Indian ricegrass	5.0	25	1.25

Note: For small-scale pollinator plantings, an alternative to the seeding mixtures above is to establish containerized plants. This has the advantage of quick establishment for better weed competition and pollinator habitat value. Another advantage is the ability to plant blocks of the same species (i.e., blocks of at least 3 feet in diameter). This greatly increases the efficiency of pollination since bees and other insects will easily move among flowers of the same plant species and facilitates weeding. Bumble bees, in particular, demonstrate flower constancy.

CONSERVATION RESERVE PROGRAM (CRP) POLLINATOR HABITAT GUIDELINES (CP-42) (Revised March 2016)

FSA has received an approved “*Alternate Standard for species diversity*” for CRP Pollinator Habitat Conservation Practice (CP42) to be implemented in arid areas of Montana. The “*Alternative Standard*” pollinator plantings, require at a minimum, at least one (1) native bunchgrass, and at least three (3) forb, legume, and/or shrub species, with at least one of which flowers in each of the blooming periods (April – June 15, June 15 – through the end of July, and August through October) and adapted to the site. Species are to be selected from the flowering groups listed above:

1. On an entire field or offered acreage.
2. In one large block in the CRP field (blocks must be at least ½-acre and strips must be at least ½-acre and 20’ wide) or;
3. Separate blocks of at least ½-acre, located throughout the field or offered acreage.

NOTE: Some CRP National Environmental Index Factors (EBI) may add more requirements to a pollinator planting to receive extra points. One example is that 10% of the offered acreage must be planted to a pollinator mix in order to receive the extra points.

All grass plantings must be native and non-sod forming. Bunch grasses are preferred as they provide nesting habitat for native bees.

Wildflower, legume and/or shrub species are encouraged to be native, but beneficial introduced flowering plants (e.g., alfalfa and clover) may be part of the mix, as long as:

1. Each introduced species should not make up more than 10% and alfalfa must be limited to 5% of the PLS seed mixture;
2. The total of the introduced species should not exceed 20% of the PLS seed mixture;
3. Grass cannot exceed 25% of the PLS seed mixture;
4. State certified seed shall be used for CP-42 where practicable;
5. No trees may be enrolled or seeded/planted into CP-42.

Woody habitat, such as brush piles, and downed tree structures, if included in the CRP plan may be included. Woody habitat is not to exceed 1,500 square feet per acre or exceed one acre in total.

Soil loss cannot exceed soil loss tolerance levels. Precautions for areas of concentrated flow and areas prone to wind erosion should be taken. In many cases double seeding the specific area with a grass other than a bunchgrass will be sufficient. Examples of grass species to use for this purpose would be: Western Wheatgrass; Sodar Streambank Wheatgrass; or Sideoatsgrama.

Periodic maintenance (management activity) **must** be performed to assure that grass litter does not suppress the pollinator-friendly plants. Management activities **MUST** be completed before the end of year six of the CRP-1 contract (2-CRP Par 428).

If pollinator-friendly plants are present over the entire CRP field, maintenance can be performed according to policy in Montana Notice CRP-857, the 2-CRP (Rev. 5) Montana Amendment 7, Paragraph 428 and Exhibit 11 for CP-42 (fields larger than 80 acres, a management activity may be performed on 60% of the acreage in year six and the remaining 40% in year seven (7) of the CRP-1 contract. For 15 year contracts, Management activity must be completed by the end of year nine (9) of the CRP-1 contract. The State Technical Committee (2016) approved an allowance for up to a 10% acreage increase in the acres to be permitted. In **NO** case should a management activity be performed on 100% of all the acres in one year.

If pollinator-friendly plants are established in separate areas (and are less than 80 acres) from the over-all seeding, maintenance activities may be performed on the entire CP-42 acreage if done after the first killing frost in the fall and prior to April 15.

Although Mid-Contract-Management activities are required, they cannot be completed during the established Primary Nesting Season for Montana (May 15–July 15).

CP-42 **CANNOT** to be harvested or grazed by domestic livestock for the life of the CRP-1 contract (2-CRP Exhibit 11).

Appropriate management activities associated with pollinator habitat include: Residue Management (includes: light disking, and harrowing < 4” deep); or Prescribed Burning; Mowing is generally an inadequate means of disturbance for pollinator habitat, except to remove annual weeds during establishment or to facilitate a prescribed burn or light disking.

HONEY BEE POLLINATOR INITIATIVE (HBPI) EQIP GUIDELINES (March 2016)

USDA and NRCS are increasing efforts to support honey bee health. The HBPI will provide floral forage habitats that directly benefit hive nutritional health as part of an overall effort to increase the health of the honey bee. The plant species list provided in the Honey Bee Fact Sheet provide recommended species for honey bee forage. Emphasis was on identifying species to promote honey bee forage for resident honey bees and for migratory beekeepers who summer their bees in this part of the county from June through September. NRCS staff should consider site-specific requirements, compatibility with other species, the ability for these species to address primary resource concerns, potential for weediness, and toxicity concerns when making species recommendations with landowners.

Grazing cannot occur on planting sites until after the end of the late bloom period. If haying is planned, “delayed haying” will need to be followed on all or a portion of the planting.

Monitoring is offered under the HBPI. If ranking points were received then the participant must monitor throughout the blooming periods in two week intervals (refer to Montana NRCS Honey Bee Habitat Effort Monitoring Protocol). The participant must provide the completed forms to

NRCS on an ongoing basis. This data will be collected and used to design better planting mixes and provide essential information to the landowner to use in lessening the effects of pesticide application and drift.

References

NRCS. 2008. Using Farm Bill Programs for Pollinator Conservation. National Plant Data Center. Technical Note No. 78.

Xerces Society. 2007. Farming for Bees. Xerces Society for Invertebrate Conservation. Portland, OR.

Oregon State University. 2006. How to Reduce Bee Poisoning from Pesticides. Pacific Northwest Extension Publication, PNW 591.

Xerces Society. 2011. Attracting Native Pollinators. Storey Publishing, North Adams, MA.

FSA Handbook – Agricultural Resource Conservation Program, 2-CRP (Rev. 5).