



The Bee & Butterfly Habitat Fund

North Dakota Monarch Mixture

Fall 2022

Species	Scientific Name	PLS lbs per acre	Seeds per sq ft	% of Mixture	Bloom Period	Pollinator Value
Big Bluestem, Pawnee	<i>Andropogon gerardii</i>	0.400	1.32	3.76%	--	--
Canada Wildrye	<i>Elymus canadensis</i>	0.400	1.05	2.97%	--	--
Green Needlegrass	<i>Stipa viridula</i>	0.200	0.77	2.19%	--	--
Little Bluestem, VNS	<i>Schizachyrium scoparium</i>	0.350	1.93	5.49%	--	--
Plains Oval Sedge	<i>Carex brevior</i>	0.050	0.74	2.11%	--	--
Prairie Junegrass	<i>Koeleria pyramidata</i>	0.030	1.59	4.52%	--	--
Sideoats Grama, Butte	<i>Bouteloua curtipendula</i>	0.300	1.10	3.11%	--	--
Western Wheatgrass, Barton	<i>Elymus smithii</i>	0.500	1.31	3.71%	--	--
Anise Hyssop	<i>Agastache foeniculum</i>	0.025	0.83	2.35%	3	5
Aromatic Aster	<i>Aster oblongifolius</i>	0.008	0.95	2.69%	3	5
Ashy Sunflower	<i>Helianthus mollis</i>	0.035	0.16	0.46%	3	5
Blackeyed Susan	<i>Rudbeckia hirta</i>	0.040	1.45	4.11%	2	1
Blanketflower	<i>Gaillardia aristata</i>	0.100	0.43	1.21%	1	4
Blue Vervain	<i>Verbena hastata</i>	0.030	1.04	2.94%	2	5
Canada Goldenrod	<i>Solidago canadensis</i>	0.005	0.81	2.31%	2	5
Canada Milkvetch	<i>Astragalus canadensis</i>	0.080	0.50	1.41%	2	4
Clasping Coneflower	<i>Rudbeckia amplexicaulis</i> or <i>Dracopis amplexicaulis</i>	0.025	0.92	2.61%	1	2
Common Evening Primrose	<i>Oenothera biennis</i>	0.030	0.95	2.69%	2	4
Common Milkweed	<i>Asclepias syriaca</i>	0.060	0.11	0.32%	2	5
Deer Vetch	<i>Lotus unifoliolatus</i>	0.038	0.06	0.17%	3	4
False Boneset	<i>Brickellia eupatorioides</i>	0.010	0.12	0.34%	3	3
False or Oxeye Sunflower	<i>Heliopsis helianthoides</i>	0.140	0.33	0.95%	2	5
Four-point Evening Primrose	<i>Oenothera rhombipetala</i>	0.010	0.58	1.64%	2	4
Foxglove Beardstongue	<i>Penstemon digitalis</i>	0.025	0.23	0.65%	1	5
Golden Alexander	<i>Zizia aurea</i>	0.050	0.20	0.57%	1	5
Gray Goldenrod	<i>Solidago nemoralis</i>	0.005	0.12	0.33%	3	4
Grayhead Coneflower	<i>Ratibida pinnata</i>	0.050	0.49	1.39%	2	4
Hoary Vervain	<i>Verbena stricta</i>	0.040	0.54	1.53%	2	5
Illinois Bundlesflower	<i>Desmanthus illinoensis</i>	0.250	0.49	1.38%	2	5
Ironweed	<i>Vernonia fasciculata</i>	0.020	0.18	0.50%	2	5
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	0.200	1.01	2.88%	2	4
Late or Giant Goldenrod, Native Source	<i>Solidago gigantea</i>	0.006	1.04	2.96%	3	5
Maximilian Sunflower	<i>Helianthus maximiliani</i>	0.090	0.41	1.15%	3	5
Missouri Goldenrod, Native Source	<i>Solidago missouriensis</i>	0.005	0.72	2.06%	2	5
New England Aster	<i>Symphotrichum novae-angliae</i>	0.010	0.24	0.69%	3	5
Phacelia	<i>Phacelia spp.</i>	0.600	3.37	9.58%	2	5
Pitcher Sage	<i>Salvia azurea</i>	0.025	0.17	0.49%	3	5
Plains Bee Balm, Native Source	<i>Monarda pectinata</i>	0.007	0.30	0.84%	2	2
Plains Sunflower	<i>Helianthus petiolaris</i>	0.060	0.16	0.45%	3	5
Prairie Aster	<i>Symphotrichum falcatum</i>	0.035	0.33	0.93%	3	5
Purple Prairieclover	<i>Dalea purpurea</i>	0.080	0.58	1.65%	2	5
Rough Gayfeather	<i>Liatis aspera</i>	0.020	0.13	0.36%	3	5
Rough Purple Gerardia, Native Source	<i>Agalinis aspera</i>	0.005	0.24	0.69%	2	4
Roundhead Lespedeza	<i>Lespedeza capitata</i>	0.030	0.12	0.34%	3	4
Shell-leaf Penstemon	<i>Penstemon grandiflorus</i>	0.025	0.12	0.35%	1	5
Showy Milkweed	<i>Asclepias speciosa</i>	0.040	0.06	0.18%	2	5
Showy Partridgepea	<i>Chamaecrista fasciculata</i>	0.300	0.45	1.27%	2	5
Smooth Blue Aster	<i>Aster laevis</i>	0.015	0.35	0.99%	3	5
Stiff Goldenrod	<i>Solidago rigida</i>	0.020	0.31	0.88%	3	5
Stiff Sunflower	<i>Helianthus pauciflorus</i>	0.020	0.34	0.96%	2	4
Tall Boneset	<i>Eupatorium altissimum</i>	0.025	0.46	1.30%	3	4
Upright Coneflower	<i>Ratibida columnifera</i>	0.040	0.68	1.92%	2	2
Western Yarrow	<i>Achillea millefolium</i>	0.015	0.98	2.79%	1	2
White Prairieclover	<i>Dalea candidum</i>	0.060	0.42	1.19%	2	5
Wild Bergamot	<i>Monarda fistulosa</i>	0.030	0.88	2.49%	2	5
Willow-leaf Sunflower	<i>Helianthus salicifolius</i>	0.050	0.08	0.23%	3	5
Rice Hulls - Filler for low planting rate mixtures		3.000	0.00	0.00%	--	--
Grasses Total:		2.230	9.818	27.86%		
Wildflower/Forb/Legume Total:		2.889	25.422	72.14%		
Filler Total:		3.000	0.000	0.00%		
Total Mixture:		8.119	35.240	100.00%		

Bloom Period	Wildflowers Used in Mixture	% PLS Seeding Rate of Mix
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Species	Scientific Name	PLS lbs per acre	Seeds per sq ft	% of Mixture	Bloom Period	Pollinator Value
1 = April to May	6	8.18%		4.38	Pollinator Value (0-5)	
2 = June to July	24	46.87%		<i>The Pollinator value score is determined based on a combination of factors described below. A score greater than 4.0 indicates the mixture is designed for great pollinator value.</i>		
3 = August to October	18	17.10%				
Total :	48					

The Pollinator Value Score is determined based on a combination of factors that include:

The pollen and/or nectar value of the plant species.
The ability of the plant species to establish and persist in pollinator seeding mixtures.
Bee Integrated Program research results of pollinator pollen analysis.
Unique pollinator biological life histories of the plant species.
The total bloom period length of the plant species.
The occurrence in early bloom periods (Bloom Period 1) that are hard to challenging to provide resources for.
The commercial availability of the species for use in seeding mixtures.
Value of the plant species pollen and nectar to commercial beekeepers.
USGS Pollinator Library tool: <https://www.npwrc.usgs.gov/pollinator/home>
The Ecoregional Revegetation Application tool: <http://www.nativerrevegetation.org/era/>
Botanical and beekeeping reference materials that list the pollinator value of species.
Field observations of floral resource use by pollinator species.