

Seed A Legacy Program

ND Monarch Butterfly Mix

Spring 2021

Species	Scientific Name	Suggested Seeding Rates	PLS lbs per acre	PLS seeds per sq ft	% of Mixture PLS	Bloom Period	Pollinator Value
Big Bluestem, VNS	<i>Andropogon gerardii</i>	--	0.400	1.32	3.77%	--	--
Canada Wildrye	<i>Elymus canadensis</i>	--	0.400	1.05	2.98%	--	--
Green Needlegrass	<i>Stipa viridula</i>	--	0.200	0.77	2.19%	--	--
Little Bluestem, VNS	<i>Schizachyrium scoparium</i>	--	0.350	1.93	5.50%	--	--
Plains Oval Sedge	<i>Carex brevior</i>	0.01 - 0.05	0.050	0.74	2.12%	--	--
Prairie Junegrass	<i>Koeleria pyramidata</i>	--	0.030	1.59	4.54%	--	--
Sideoats Grama, Native Source	<i>Bouteloua curtipendula</i>	--	0.300	1.10	3.12%	--	--
Western Wheatgrass, Barton	<i>Elymus smithii</i>	--	0.500	1.31	3.72%	--	--
Anise Hyssop	<i>Agastache foeniculum</i>	0.003 - 0.015	0.025	0.83	2.35%	3	5
Aromatic Aster	<i>Aster oblongifolius</i>	0.001 - 0.01	0.008	0.95	2.70%	3	5
Ashy Sunflower, Native Source	<i>Helianthus mollis</i>	0.01 - 0.04	0.025	0.12	0.33%	3	5
Blackeyed Susan	<i>Rudbeckia hirta</i>	0.01 - 0.1	0.040	1.45	4.12%	2	1
Blanketflower - G. aristata	<i>Gaillardia aristata</i>	0.04 - 0.2	0.100	0.43	1.22%	1	4
Blue Vervain	<i>Verbena hastata</i>	0.008 - 0.03	0.030	1.04	2.95%	2	5
Canada Goldenrod, Native Source	<i>Solidago canadensis</i>	0.001 - 0.005	0.005	0.81	2.31%	2	5
Canada Milkvetch	<i>Astragalus canadensis</i>	0.02 - 0.15	0.080	0.50	1.41%	2	4
Clasping Coneflower	<i>Rudbeckia amplexicaulis</i> or <i>Dracopis amplexicaulis</i>	0.01 - 0.05	0.025	0.92	2.61%	1	2
Common Evening Primrose	<i>Oenothera biennis</i>	0.005 - 0.04	0.030	0.95	2.70%	2	4
Common Milkweed	<i>Asclepias syriaca</i>	0.03 - 0.08	0.050	0.09	0.27%	2	5
Deer Vetch, Native Source	<i>Acmispon americanus</i> or <i>Lotus unifoliolatus</i>	0.01 - 0.04	0.030	0.05	0.14%	3	4
False Boneset	<i>Brickellia eupatorioides</i>	0.005 - 0.01	0.010	0.12	0.34%	3	3
False or Oxeye Sunflower	<i>Heliopsis helianthoides</i>	0.03 - 0.09	0.140	0.33	0.95%	2	5
Four-point Evening Primrose, Native Source	<i>Oenothera rhombipetala</i>	0.005 - 0.01	0.010	0.58	1.64%	2	4
Foxglove Beardstongue	<i>Penstemon digitalis</i>	0.01 - 0.03	0.025	0.23	0.65%	1	5
Golden Alexander	<i>Zizia aurea</i>	0.02 - 0.04	0.045	0.18	0.52%	1	5
Gray Goldenrod	<i>Solidago nemoralis</i>	0.001 - 0.005	0.005	0.12	0.33%	3	4
Grayhead Coneflower	<i>Ratibida pinnata</i>	0.01 - 0.1	0.050	0.49	1.40%	2	4
Heath Aster	<i>Symphyotrichum ericoides</i>	0.001 - 0.004	0.005	0.58	1.65%	3	5
Hoary Vervain, Native Source	<i>Verbena stricta</i>	0.01 - 0.06	0.040	0.54	1.53%	2	5
Illinois Bundleflower	<i>Desmanthus illinoensis</i>	0.05 - 0.25	0.250	0.49	1.39%	2	5
Ironweed	<i>Vernonia fasciculata</i>	0.02 - 0.06	0.020	0.18	0.50%	2	5
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	0.05 - 0.1	0.200	1.01	2.89%	2	4
Late or Giant Goldenrod, Native Source	<i>Solidago gigantea</i>	0.001 - 0.005	0.005	0.87	2.47%	3	5
Maximilian Sunflower	<i>Helianthus maximiliani</i>	0.01 - 0.05	0.090	0.41	1.15%	3	5
Missouri Goldenrod	<i>Solidago missouriensis</i>	0.001 - 0.007	0.005	0.72	2.06%	2	5
Phacelia	<i>Phacelia</i> spp.	0.08 - 0.5	0.600	3.37	9.60%	2	5
Pitcher Sage	<i>Salvia azurea</i>	0.01 - 0.04	0.020	0.14	0.39%	3	5
Plains Bee Balm, Native Source	<i>Monarda pectinata</i>	0.005 - 0.02	0.007	0.30	0.84%	2	2
Plains Sunflower	<i>Helianthus petiolaris</i>	0.01 - 0.05	0.060	0.16	0.45%	3	5
Prairie Aster	<i>Symphyotrichum falcatum</i>	0.015 - 0.05	0.035	0.33	0.93%	3	5
Purple Prairieclover	<i>Dalea purpurea</i>	0.04 - 0.15	0.080	0.58	1.66%	2	5
Rough Gayfeather	<i>Liatris aspera</i>	0.01 - 0.03	0.020	0.13	0.36%	3	5
Rough Purple Gerardia, Native Source	<i>Agalinis aspera</i>	0.002 - 0.006	0.004	0.19	0.55%	2	4
Roundhead Lespedeza	<i>Lespedeza capitata</i>	0.02 - 0.05	0.030	0.12	0.34%	3	4
Shell-leaf Penstemon	<i>Penstemon grandiflorus</i>	0.01 - 0.04	0.020	0.10	0.28%	1	5
Showy Milkweed	<i>Asclepias speciosa</i>	0.01 - 0.06	0.040	0.06	0.18%	2	5
Showy Partridgepea	<i>Chamaecrista fasciculata</i>	0.1 - 0.4	0.300	0.45	1.27%	2	5
Smooth Blue Aster	<i>Symphyotrichum laeve</i>	0.005 - 0.02	0.015	0.35	0.99%	3	5
Stiff Goldenrod	<i>Solidago rigida</i>	0.01 - 0.02	0.020	0.31	0.88%	3	5
Stiff Sunflower	<i>Helianthus pauciflorus</i>	0.01 - 0.04	0.020	0.34	0.97%	2	4
Tall Boneset	<i>Eupatorium altissimum</i>	0.006 - 0.025	0.025	0.46	1.31%	3	4
Upright Coneflower	<i>Ratibida columnifera</i>	0.02 - 0.08	0.040	0.68	1.93%	2	2
Western Yarrow	<i>Achillea millefolium</i>	0.01 - 0.05	0.015	0.98	2.79%	1	2
White Prairieclover	<i>Dalea candida</i>	0.05 - 0.2	0.060	0.42	1.19%	2	5
Wild Bergamot	<i>Monarda fistulosa</i>	0.01 - 0.03	0.030	0.88	2.49%	2	5
Willow-leaf Sunflower, Native Source	<i>Helianthus salicifolius</i>	0.01 - 0.04	0.020	0.03	0.09%	3	5
Rice Hulls - Filler for low planting rate mixtures		--	3.000	0.00	0.00%	--	--

Grasses Total: 2.230 9.818 27.93%
Wildflower/Forb/Legume Total: 2.809 25.331 72.07%

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Filler Total:			3.000	0.000	0.00%		
Total Mixture:			8.039	35.149	100.00%		

COC = Coefficient of Conservatism
 Native Seed Designation

Bloom Period	Wildflowers Used in Mixture	% PLS Seeding Rate of Mix
1 = April to May	6	8.07%
2 = June to July	24	46.80%
3 = August to October	18	17.20%
Total :	48	

4.38 Pollinator Value

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

- The pollen and/or nectar value of the plant species.
- Bee Integrated Program research results of pollinator pollen analysis
- Unique pollinator biological life histories of the plant species.
- The ability of the plant species to establish and persist in pollinator seeding mixtures.
- 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.