

Seed A Legacy Program

Michigan 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>	--	0.300	0.99	2.82%	--	--
Canada Wildrye	<i>Elymus canadensis</i>	--	0.500	1.31	3.72%	--	--
Little Bluestem, VNS	<i>Schizachyrium scoparium</i>	--	0.400	2.21	6.28%	--	--
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	4.53%	--	--
Sideoats Grama, Native Source	<i>Bouteloua curtipendula</i>	--	0.500	1.83	5.19%	--	--
Ashy Sunflower, Native Source	<i>Helianthus mollis</i>	0.01 - 0.04	0.035	0.16	0.46%	3	5
Blackeyed Susan	<i>Rudbeckia hirta</i>	0.01 - 0.1	0.030	1.09	3.09%	2	1
Blanketflower - G. pulchella	<i>Gaillardia pulchella</i>	0.04 - 0.2	0.250	1.07	3.04%	1	4
Blue Vervain, Native Source	<i>Verbena hastata</i>	0.008 - 0.03	0.030	1.04	2.94%	2	5
Butterfly Milkweed	<i>Asclepias tuberosa</i>	0.01 - 0.04	0.020	0.03	0.09%	2	5
Canada Goldenrod	<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	0.100	0.62	1.77%	2	4
Canada Tick-trefoil	<i>Desmodium canadense</i>	0.01 - 0.03	0.150	0.30	0.86%	2	5
Common Evening Primrose	<i>Oenothera biennis</i>	0.005 - 0.04	0.030	0.95	2.69%	2	4
Common Milkweed, Michigan Native	<i>Asclepias syriaca</i>	0.03 - 0.08	0.055	0.10	0.29%	2	5
Cup Plant, Native Source	<i>Silphium perfoliatum</i>	0.01 - 0.05	0.050	0.07	0.21%	2	5
Deer Vetch, Native Source	<i>Acmispon americanus</i> or <i>Lotus unifoliolatus</i>	0.01 - 0.04	0.020	0.03	0.09%	3	4
Dotted Mint	<i>Monarda punctata</i>	0.008 - 0.015	0.030	1.01	2.88%	2	4
False Boneset	<i>Brickellia eupatorioides</i>	0.005 - 0.01	0.025	0.30	0.85%	3	3
False or Oxeye Sunflower	<i>Heliopsis helianthoides</i>	0.03 - 0.09	0.250	0.60	1.70%	2	5
Foxglove Beardstongue	<i>Penstemon digitalis</i>	0.01 - 0.03	0.035	0.32	0.91%	1	5
Golden Alexander	<i>Zizia aurea</i>	0.02 - 0.04	0.100	0.40	1.15%	1	5
Gray Goldenrod	<i>Solidago nemoralis</i>	0.001 - 0.005	0.009	0.21	0.59%	3	4
Grayhead Coneflower	<i>Ratibida pinnata</i>	0.01 - 0.1	0.065	0.64	1.81%	2	4
Heath Aster	<i>Symphotrichum ericoides</i>	0.001 - 0.004	0.009	1.04	2.96%	3	5
Hoary Vervain	<i>Verbena stricta</i>	0.01 - 0.06	0.050	0.67	1.91%	2	5
Jerusalem Artichoke, Native Source	<i>Helianthus tuberosus</i>	0.015 - 0.03	0.025	0.07	0.19%	3	5
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	0.05 - 0.1	0.200	1.01	2.88%	2	4
Late or Giant Goldenrod, Native Source	<i>Solidago gigantea</i>	0.001 - 0.005	0.006	1.04	2.96%	3	5
Maximillian Sunflower	<i>Helianthus maximiliani</i>	0.01 - 0.05	0.080	0.36	1.03%	3	5
Missouri Goldenrod	<i>Solidago missouriensis</i>	0.001 - 0.007	0.007	1.01	2.88%	2	5
New England Aster	<i>Symphotrichum novae-angliae</i>	0.005 - 0.01	0.025	0.61	1.72%	3	5
New Jersey Tea	<i>Ceanothus americanus</i>	0.01 - 0.04	0.020	0.05	0.15%	2	4
Plains Coreopsis	<i>Coreopsis tinctoria</i>	0.01 - 0.05	0.020	1.48	4.21%	2	2
Plains Sunflower	<i>Helianthus petiolaris</i>	0.01 - 0.05	0.060	0.16	0.45%	3	5
Purple Coneflower	<i>Echinacea purpurea</i>	0.05 - 0.2	0.300	0.80	2.26%	2	5
Purple Meadow Rue	<i>Thalictrum dasycarpum</i>	0.03 - 0.05	0.020	0.08	0.23%	1	3
Rough Gayfeather	<i>Liatris aspera</i>	0.01 - 0.03	0.020	0.13	0.36%	3	5
Roundhead Lespedeza	<i>Lespedeza capitata</i>	0.02 - 0.05	0.040	0.16	0.45%	3	4
Sawtooth Sunflower	<i>Helianthus grosseserratus</i>	0.005 - 0.04	0.010	0.14	0.41%	3	5
Showy Partridgepea	<i>Chamaecrista fasciculata</i>	0.1 - 0.4	0.500	0.75	2.12%	2	5
Showy-wand Goldenrod	<i>Solidago speciosa</i>	0.001 - 0.008	0.010	0.98	2.80%	3	5
Skyblue Aster	<i>Symphotrichum oolentanqiense</i>	0.003 - 0.006	0.015	0.44	1.25%	3	5
Smooth Blue Aster	<i>Symphotrichum laeve</i>	0.005 - 0.02	0.025	0.58	1.65%	3	5
Stiff Goldenrod	<i>Solidago rigida</i>	0.01 - 0.02	0.040	0.62	1.76%	3	5
Stiff Sunflower	<i>Helianthus pauciflorus</i>	0.01 - 0.04	0.035	0.59	1.69%	2	4
Sullivant's Milkweed	<i>Asclepias sullivantii</i>	0.01 - 0.05	0.010	0.02	0.05%	2	5
Swamp Milkweed, Native Source	<i>Asclepias incarnata</i>	0.01 - 0.03	0.020	0.07	0.20%	2	5
Upright Coneflower	<i>Ratibida columnifera</i>	0.02 - 0.08	0.050	0.85	2.41%	2	2
Western Yarrow	<i>Achillea millefolium</i>	0.01 - 0.05	0.020	1.31	3.72%	1	2
White Vervain, Native Source	<i>Verbena urticifolia</i>	0.002 - 0.004	0.020	0.51	1.44%	2	4
Wild Bergamot	<i>Monarda fistulosa</i>	0.01 - 0.03	0.040	1.17	3.32%	2	5
Wild Senna	<i>Senna hebecarpa</i>	0.04 - 0.08	0.070	0.04	0.10%	2	2
Rice Hulls - Filler for low planting rate mixtures		--	3.000	0.00	0.00%	--	--
Grasses Total:			1.780	8.678	24.67%		
Wildflower/Forb/Legume Total:			3.036	26.499	75.33%		
Filler Total:			3.000	0.000	0.00%		

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Total Mixture:			7.816	35.177	100.00%		

Bloom Period	Wildflowers Used in Mixture	% PLS Seeding Rate of Mix
1 = April to May	5	9.06%
2 = June to July	26	46.28%
3 = August to October	17	20.00%
Total :	48	

 **4.33 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.nativevegetation.org/era/>
- Botanical and beekeeping reference materials that list the pollinator value of species.
- Field observations of floral resource use by pollinator species.