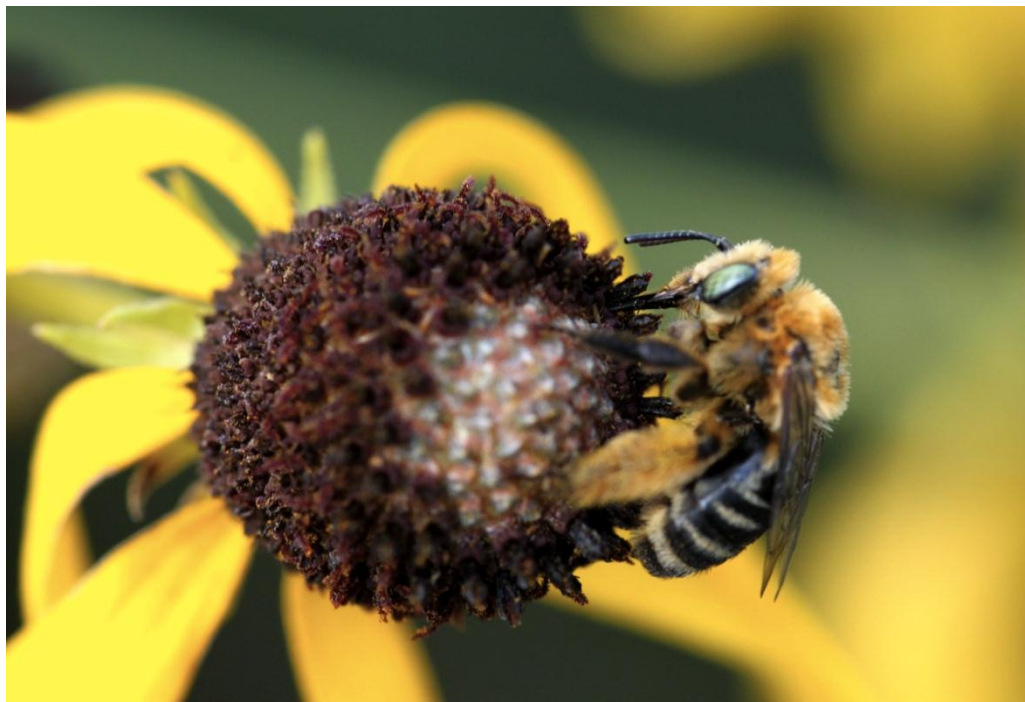


CONSERVING

BENEFICIAL INSECTS with NATIVE PLANTS



Ecosystem Services

are goods and services humans obtain from managed and natural ecosystems such as food, fuel, fiber, and recreation. **POLLINATORS & NATURAL ENEMIES** are examples of beneficial insects that play a vital role in ecological processes that support these services.

Pollinators

contribute to food production through crop pollination. The annual value of pollination services to U.S. agriculture is estimated at \$20 billion. Insects also pollinate wild plants (top), which is essential for natural ecosystems. Honey bees, are the most recognized pollinator, however there are 4,000 species of wild bees in North America and several other insects are considered pollinators.

Natural Enemies

insects predators (bottom right) and parasitoids (bottom left) attack and feed on other insects. They protect cultivated and wild plants through the suppression of insect plant pests. Natural enemies can reduce the need for insecticides.

Habitat restoration is important for conserving and protecting beneficial insect communities and sustaining the ecosystem services they provide. Thoughtful establishment of native perennial plants will provide multiple, long-term resources that beneficial insects need to persist such as nectar, pollen, nesting habitat, and overwintering sites. Native perennial plants have several advantages compared to annual exotic plants.

ADVANTAGES OF NATIVE PERENNIAL PLANTS

- Adapted to local conditions
- Establish for multiple years
- Offer permanent refuge
- Provide floral resources
- Less likely to become invasive
- Promote native biodiversity
- Require less maintenance
- Contribute to ecological resilience

CONSERVING BENEFICIAL INSECTS with NATIVE PLANTS

GUIDELINES FOR PLANT SELECTION

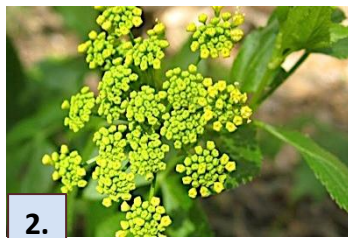
Mixtures should include:

- ☀ Local ecotypes
- ☀ Species bloom in spring, summer, and fall (at least 3 species per bloom period)
- ☀ Species that are not overly aggressive
- ☀ Flowers with a variety of shapes and colors
- ☀ Warm-season grasses (less than 30% of mixture should consist of grasses)
- ☀ Between 20 - 40 seeds per square foot

** The mixture below was developed for Iowa. Plants are suited for full sun and a range of soil conditions.

For more information and resources refer to:

- www.nrcs.usda.gov
- <http://www.xerces.org>
- <http://www.sare.org>
- <https://attra.ncat.org>



The "MSU BEST BET" mixture

Bloom period	image	Common name	Scientific name	Attractiveness rating	
				Bees	Natural enemies
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Early</div> <div style="width: 10px; height: 100px; background: linear-gradient(to bottom, #f00, #fff); border: 1px solid #000; margin: 0 5px;"></div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Mid</div> </div> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Late</div> <div style="width: 100px; height: 100px; background: linear-gradient(to bottom, #fff, #f00); border: 1px solid #000; margin: 0 5px;"></div> </div>	1	Canadian anemone	<i>Anemone canadensis</i>	*	**
	2	Meadow zizia	<i>Zizia aptera</i>	**	***
	3	Pinnate coneflower	<i>Ratibida pinnata</i>	**	**
	4	Swamp milkweed	<i>Asclepias incarnata</i>	**	*
	5	Common boneset	<i>Eupatorium perfoliatum</i>	**	***
	6	Cup plant	<i>Silphium perfoliatum</i>	***	***
	7	Prairie ironweed	<i>Vernonia fasciculata</i>	**	***
	8	New England aster	<i>Symphyotrichum novae-angliae</i>	**	***
	not shown	Smooth blue aster	<i>Symphyotrichum laeve</i>	**	***
	Grasses	Canada wildrye	<i>Elymus canadensis</i>		
		Switchgrass	<i>Panicum virgatum</i>		
		Little bluestem	<i>Schizachyrium scoparium</i>		

* GOOD
** BETTER
***BEST

The species listed above were evaluated individually for their attractiveness to beneficial insects (bees and natural enemies) by research conducted at Michigan State University (see http://nativeplants.msu.edu/plant_facts). This combination is the most effective for attracting diverse and abundant beneficial insect communities and was named the "MSU Best Bet" mixture. Research conducted at Iowa State University revealed that when these plants are combined they produce a habitat that attracts more beneficial insects than plants currently used to reconstruct prairies.

Photos (front, back: 4,6,8) by Adam Varenhorst and (back: 1-3, 5,7) PLANTS Database, USDA Plants <http://plants.usda.gov>