NRCS	**Michigan Technical Note** **USDA-Natural Resources Conservation Service**

BIOLOGY TECH NOTE #18

Attracting Beneficial Insects with Native Flowering Plants

Date: December 2012

GENERAL INFORMATION

Following for your use and distribution is a technical note, Attracting Beneficial Insects with Native Flowering Plants. This is Michigan State University Extension Bulleting E2973, revised January, 2008, authored by Anna Fielder, Julianna Tuell, Rufus Isaacs, and Doug Landis and is used by permission of the authors.

NATURAL ENEMIES

Some insects eat other insects and can provide natural pest control on farms and in gardens. These natural enemies can be divided into two groups — predators and parasitoids. Many predators and parasitoids are attracted to flowering plants, where they obtain pollen and nectar that help increase their life span and ability to lay eggs. The table in this bulletin can be used to select plants that provide flowers for these insects through the growing season.

Predators eat many prey in a lifetime, feeding both as young and as adults, and include some bugs, beetles, flies, lacewings and spiders. All shown here eat small, soft-bodied insects and help control aphid, whitefly, and mealybug populations. Spiders will also eat larger insects.

Howard Russell

Minute pirate bug

D. Landis

Lady beetle

A. Fiedler

Syrphid fly

David Keith, University of Nebraska-Lincoln

Crab spider

Jim Kalisch & Tom Clark, University of Nebraska-Lincoln

Braconid wasp

Jim Kalisch & Tom Clark, University of Nebraska-Lincoln

Ichneumonid wasp

Gerald J. Lenhard

Chalcid wasp

Parasitoids seek other insects as hosts in which to lay their eggs. Each egg hatches within the host, and the young feed and develop within that single host, eventually killing it. Parasitoids are most commonly small wasps. Hosts can be from almost any insect group, including beetle larvae, caterpillars, flies, and other wasps.

For more information on natural enemies, please see the *Other Resources* section on page 5.

POLLINATORS

Pollinating insects play a critical role in maintaining productive natural plant communities, and they also pollinate most crop plants grown for their fruits, vegetables, nuts, seeds, and fiber. Bees are excellent pollinators because they spend most of their adult lives collecting pollen to feed to their developing offspring. The plumed hairs on their bodies attract pollen grains, and "brushes" on their legs enable them to collect pollen and carry it back to the nest. Flowers provide energy in the form of nectar, and many bees have long tongues that allow them to reach into deep flowers that other insects cannot use.

Five major bee families are found in the Midwest: **Apidae** (honey bees, bumble bees, carpenter bees, and a diverse group of solitary soil-nesting bees), **Andrenidae** (andrenid bees), **Halictidae** (sweat bees), **Megachilidae** (leafcutter and mason bees), and **Colletidae** (cellophane bees, not shown). Some of the more common species in these groups are pictured here.

J. Tuell

Honey bee

J. Tuell

Bumble bee

J. Tuell

Carpenter bee

J. Tuell

Andrenid bee

J. Tuell

Sweat bee, brown

J. Tuell

Sweat bee, green

S. Bambara, N. Carolina State Univ.

Mason bee

J. Tuell

Leafcutter bee

Most bee species are solitary (each female produces offspring in her own nest), with only one generation of bees per year. However, some of the most abundant species, such as honey bees and bumble bees, are social, working together to provision a single nest in which a queen presides and produces multiple generations per year. Bees with multiple generations per year need food resources (pollen and nectar) across most of the growing season to build their colonies. Providing plants with overlapping bloom periods in a landscape will help these bees survive and prosper. The table in this bulletin can be used to select plants that will provide flowers through the growing season.

For more information on pollinators, please see the *Other Resources* section below.

Other Resources

Enhancing Beneficial Insects with Native Plants Web site: www.nativeplants.msu.edu

Flint, M.L., and S.H. Dreistadt. 1998. *Natural Enemies Handbook: the Illustrated Guide to Biological Pest Control*. Publication 3386. Berkely, CA: University of California Press, Division of Agriculture and Natural Resources.

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Attracting Beneficial Insects with Native Flowering Plants

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MICHIGAN STATE UNIVERSITY EXTENSION

Introduction

Conservation of natural enemies of insects (predators and parasitoids) and pollinators (bees) around the farm or garden can help suppress pests and increase crop yields. Many beneficial insects rely on plants for nectar and pollen or shelter. Plants commonly recommended to provide these resources are non-native annuals such as buckwheat, sweet alyssum, faba bean, dill, and coriander. In a recent Michigan State University study, we found that native Midwestern perennial plants could provide similar, and in some cases, more attractive resources.

We selected 46 native Michigan plants on the basis of their bloom periods and ability to survive in agricultural habitats. All of the species selected historically grew in prairie or oak savanna habitats. Once common in Michigan, prairies and oak savannas are now rare, as are many of the plants and animals that formerly utilized these habitats. By returning these plants to Michigan landscapes, we may be able to increase both pollination and pest control while enhancing native biodiversity.

Plant testing

Native species were established as rooted plug or 1-quart potted plants in the fall of 2003 and compared to the non-native annuals, which were planted as seed the following spring. During the 2004 and 2005 growing seasons, we determined dates of peak bloom for each species and collected insects at flowers during peak bloom. We then identified predator, parasitoid and pollinator insects collected at each plant species.

The table in this bulletin shows 26 native plants that can provide flowers throughout the growing season and are highly attractive to beneficial insects.

Cover photos: clockwise, top left: A. Fiedler; W. Cranshaw, Colorado State University; J. Tuell; A. Fiedler.

Chart photos: flower images 1 through 26: A. Fiedler.

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Establishing native plants

Local sources of native seed and potted plant material are available for Michigan and many other areas. Where possible, use local genotypes — i.e., plant material originally collected in your area and best adapted for your conditions.

Determine where you would like to establish native plants. If it is a large area (greater than 500 square feet), consider using seed to establish plants, which will flower in 3 to 5 years. If a smaller area, rooted seedlings sold in plugs or pots will flower in 1 to 2 years and will allow you to choose the position of each plant.

Consult a local native plant producer for seed mixes or plants most appropriate for your light, soil type, and moisture conditions, as well as for proper plant spacing.

Site preparation to minimize weeds is crucial to project success. Depending on the history of your site, plan on 3 months to 2 years for proper preparation. Professional plant and seeding installation services are available. If you are seeding an area yourself, you can hand broadcast seed with good results. Seed drills require a good deal of time and seed to calibrate correctly, so they are most effectively used on areas larger than an acre.

Please note: The information presented in this bulletin should be considered a guideline to be adapted for your local conditions. MSU makes no warranty about the use of the information presented here.

For more information on our research into native plants, beneficial insects and pollinators, see **www.nativeplants.msu.edu**

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Project GREEEN

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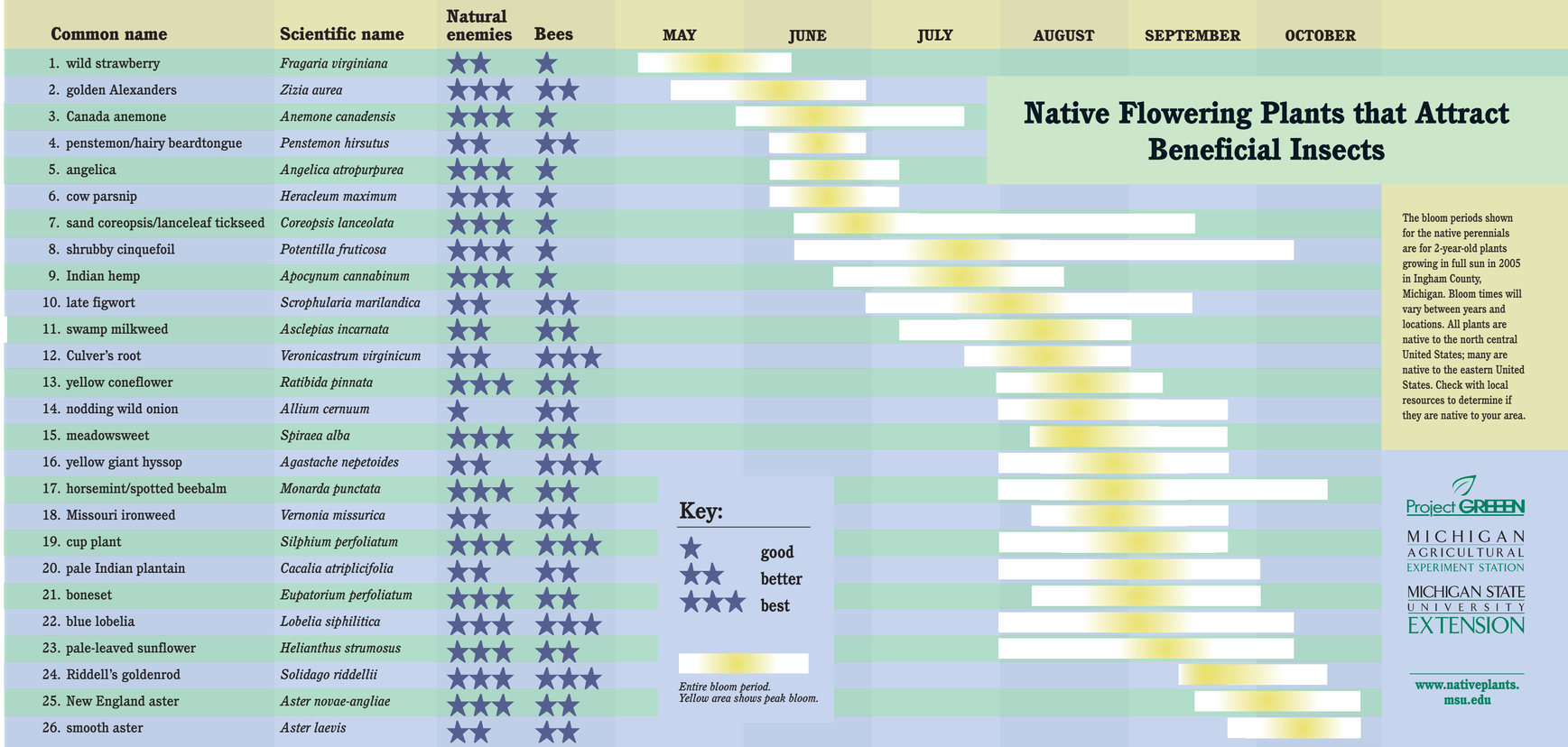
Native Flowering Plants that Attract Beneficial Insects

Common name	Scientific name	Natural enemies	Bees
1. wild strawberry	*Fragaria virginiana*	★★	★
2. golden Alexanders	*Zizia aurea*	★★★	★★
3. Canada anemone	*Anemone canadensis*	★★★	★
4. penstemon/hairy beardtongue	*Penstemon hirsutus*	★★	★★
5. angelica	*Angelica atropurpurea*	★★★	★
6. cow parsnip	*Heracleum maximum*	★★★	★
7. sand coreopsis/lanceleaf tickseed	*Coreopsis lanceolata*	★★★	★
8. shrubby cinquefoil	*Potentilla fruticosa*	★★★	★
9. Indian hemp	*Apocynum cannabinum*	★★★	★
10. late figwort	*Scrophularia marilandica*	★★	★★
11. swamp milkweed	*Asclepias incarnata*	★★	★★
12. Culver's root	*Veronicastrum virginicum*	★★	★★★
13. yellow coneflower	*Ratibida pinnata*	★★★	★★
14. nodding wild onion	*Allium cernuum*	★	★★
15. meadowsweet	*Spiraea alba*	★★★	★★
16. yellow giant hyssop	*Agastache nepetoides*	★★	★★★
17. horsemint/spotted beebalm	*Monarda punctata*	★★★	★★
18. Missouri ironweed	*Vernonia missurica*	★★	★★
19. cup plant	*Silphium perfoliatum*	★★★	★★★
20. pale Indian plantain	*Cacalia atriplicifolia*	★★	★★
21. boneset	*Eupatorium perfoliatum*	★★★	★★
22. blue lobelia	*Lobelia siphilitica*	★★★	★★★
23. pale-leaved sunflower	*Helianthus strumosus*	★★★	★★
24. Riddell's goldenrod	*Solidago riddellii*	★★★	★★★
25. New England aster	*Aster novae-angliae*	★★★	★★
26. smooth aster	*Aster laevis*	★★	★★



Key:

★ good

★★ better

★★★ best

Entire bloom period.
Yellow area shows peak bloom.

The bloom periods shown for the native perennials are for 2-year-old plants growing in full sun in 2005 in Ingham County, Michigan. Bloom times will vary between years and locations. All plants are native to the north central United States; many are native to the eastern United States. Check with local resources to determine if they are native to your area.

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