

habitat not only reduces the total amount of habitat available, it reduces pollinators' ability to move from one place to another if conditions change. Invasive non-native plants may outcompete and crowd out native plants that pollinators depend on.

Use of Insecticides and other Pesticides: Insecticides can kill pollinators outright or, in sub-lethal doses, alter behavior, making them less likely to survive or reproduce. Bees can bring toxins back to the nest, potentially harming future generations or even killing the entire hive. Smaller pollinators are generally more sensitive to insecticides than larger ones. Herbicides can also harm pollinators by destroying plants they depend on for food and shelter.

Systemic insecticides are especially dangerous to pollinators. They are absorbed and move throughout the plant and may be present in nectar and pollen. A class of systemic insecticides known as neonicotinoids may be especially harmful as they are highly toxic to bees and remain in the plants and soil for long periods of time. Systemic insecticides are also sometimes used by growers or sellers to treat seeds and transplants.

Diseases and Parasites: Some of the problems affecting honeybees include introduced mites and diseases. Colony Collapse Disorder, in which bees abandon a hive for unknown reasons, is also a problem. Imported diseases and parasites may also infect native pollinators.

There is no single cause of pollinator decline. Each stress makes the organism less able to deal with the next stress it encounters. Poorly nourished pollinators without good food sources are more vulnerable to chemicals and diseases, and insects harmed by chemicals may have a hard time finding food sources or reproducing.

Survival of pollinators that depend on a limited range of plants may be threatened if those plants disappear, and plants that depend on a single pollinator will be threatened if that pollinator disappears.

Decline isn't inevitable. With growing awareness of pollinators, efforts are being made on many fronts to help them. The brochure "Protecting Our Pollinators" gives suggestions on how anyone, regardless of situation, can help this effort.

For more information on gardening please visit:

<http://web.extension.illinois.edu/state/horticulture/index.php>

or

call University of Illinois Extension
Knox County Office
309-342-5108

Other information brochures can be found online at <http://web.extension.illinois.edu/hkmw/hort.html>

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The Importance of Pollinators

(Pollinators Part One)



Garden Tips

from

Knox County

Master Gardeners

&

Master Naturalists



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Pollinators play a very important role in our lives. In this brochure we talk about various pollinators and their roles in the ecosystem, as well as current threats to their health and survival. In a companion brochure, "Protecting Our Pollinators", we discuss some of the ways we can help pollinators.

What is Pollination?

Flowers must be pollinated in order to produce seed or fruit. This involves transferring pollen (fine dust-like particles) from one part of the flower to another, either the same flower or a flower on the same plant (self-pollination) or to a flower of a different plant of the same species (cross-pollination). Cross-pollination results in more genetic diversity and more vigorous plants. Some plants have mechanisms to prevent self-pollination.

What is a Pollinator?

Some plants can be pollinated by wind. But at least 75% of all flowering plants depend at least in part on insects or other animals for pollination.

For pollinators the plant is a food source. When they come to the flower for nectar or pollen, some of the pollen sticks to their bodies and is deposited on the next flower they visit. Pollinators can be generalists, visiting many different types of flowering plants (although they often tend to stick to the same species on any given foraging trip), or specialists, which seek out plants of a particular species or related group of species.

Pollinators are attracted to plants by color, odor, and flower shape and pattern. Different shapes of flowers attract different types of pollinators. Some pollinators have very long mouth parts and can reach the bottom of tubular or complex flowers, while others need nectar that is more accessible. Pollinators that cannot hover over the flower as they feed need blooms with a flat sturdy landing pad. Flower preference also depends on the size of the pollinator.

Bees of all types are the most important group of pollinators. They deliberately gather pollen

to bring back to the nest to feed their young, and have bodies covered with hairs to collect the pollen. Most other pollinators are mainly concerned with the nectar and only incidentally collect and transfer pollen.

Other insect pollinators include butterflies and moths, wasps, flies, beetles, and ants. Many of these, while often poorer pollinators than bees, are also beneficial for pest control. A few plants are pollinated by hummingbirds or other animals.

Bees

Honeybees have had a close association with humans since prehistoric times and are valued for their production of honey and wax, as well as for their pollination services. They are not native to North America but were brought by early European settlers. They are raised in managed hives and have the advantage of being easily transported and available in large numbers.

However, there are many native bees - bumblebees and many smaller species. These native bees are often more efficient pollinators, especially of native plants. They will often forage in wet and cool conditions that honeybees avoid. The presence of native bees may also make honeybees more efficient pollinators.

Bumblebees are often the first bees to emerge in the spring and the last to hibernate in the fall. They are especially good pollinators of plants such as tomatoes, peppers, blueberries, and cranberries. These benefit from buzz pollination, in which the bee vibrates its body to help the plant to release tightly-held pollen.

Bees can be social (honeybees, bumblebees, and some sweat bees) or solitary. Social bees form colonies, usually with a single queen responsible for egg-laying. The other bees collectively gather food, enlarge and maintain the nest, and raise the young. Among solitary bees, a single female is responsible for building and provisioning a nest for her young.

Of the native bees, 70% are ground nesters. These nests often look like small anthills, but with larger openings. The remaining 30% nest in cavities or hollow stems.

Why Are Pollinators Important?

Pollinators are what is referred to as a keystone group. The survival of many other plant and animal species is dependent on them, not only the plants they pollinate but also the animals that depend on those plants for their survival. And pollinators themselves are used as a food source by birds and other animals.

Approximately one third of the food and drink we consume depends directly or indirectly on pollinators. This includes most of the fruits and vegetables that provide variety and important nutrients in our diet. Even plants that can be wind pollinated may produce larger or better quality yields with the help of animal pollinators.

Many large-scale agricultural food crops depend heavily on managed hives of honeybees, which are trucked around the country as crops come into bloom. Even when these honeybees are used, native bees are responsible for much of the pollination.

Why Are Pollinators in Trouble?

For most of history pollinators have been taken for granted - always there when we need them, providing nature's "free service". However, that is changing.

The number of honeybees is rapidly declining. There are 50% fewer managed honeybee colonies than there were in the late 1940's, and while some winter loss of bees is normal, rates now are much higher than in previous years.

Many wild bees, butterflies, and other pollinators are also seeing numbers decline. Populations are declining worldwide. In some parts of the world where pollinators have disappeared, pollination must be performed manually by humans - a time-consuming, expensive, and inefficient task.

There are a number of factors that contribute to the decline of all pollinators.

Loss, Degradation, and Fragmentation of Habitat: A major factor is the loss of food sources and nesting or overwintering sites because of increased development and changing agricultural practices. Fragmented