

# Help Save Our Pollinators

Many plants cannot reproduce without the help of pollinators. Seventy-five percent of all plant species are pollinated by animals, with 90% of flowering plants being pollinated by animals. In fact many of the fruits and vegetables we eat rely on pollinators to reproduce. According to a 2012 Cornell University study pollinators contribute at least \$29 billion to the U.S. farm economy. Without pollinators our grocery stores would look quite different.

Insects make up the vast majority of animals that pollinate plants. Some birds and bats will also pollinate plants but this is not common in Illinois.

Direct Benefit from Pollination	
Fruits	Vegetables
Apple	Cucumber
Apricot	Eggplant
Blackberry	Okra
Blueberry	Pea
Peach, Nectarine	Pumpkin
Raspberry	Summer Squash
Strawberry	Tomato
Sweet & Tart Cherry	Watermelon
Watermelon	Winter Squash
Indirect Benefit from Pollination	
Alfalfa	Buckwheat
Carrot	Clover, Red & White
Coriander	Cotton
Crimson Clover	Crownvetch
Turnip	Scarlet Runner Bean

*A few examples of the fruits, vegetables, and other agronomic crops that rely on insects to pollinate them.*

## Pollinator Syndromes

Different flower features can influence what types of pollinators visit them. These features are referred to as pollinator syndromes. By looking at different traits that flowers possess such as flower color, scent, amount of pollen present, flower shape, and presence of nectar guides one can get an idea of what types of pollinators may pollinate that particular plant.

Nectar guides are markings or patterns on flowers that direct pollinators to nectar. Some nectar guides may be ultraviolet (UV) and aren't visible to humans. They can be found on many white and yellow flowers such as daisies and asters.









*Nectar guides on blanket flower (dark areas on petals)*

**Beetles** aren't typically thought of as pollinators. They are often referred to as 'mess and soil' pollinators because they often eat flower petals and defecate in the flowers themselves. The flowers they are attracted to tend to be white or green in color with no nectar guides. The odor will range from nothing to fruity to foul, depending on the type of beetle the flower is trying to attract. Nectar may be present and there is ample pollen. The flowers are large and bowl shaped, or small and clustered.



*Spotted cucumber beetle on daisy*

*Pollinator syndromes can help predict what type of insect may pollinate a particular plant.*

Flower Traits	 Bees, wasps	 Beetles	 Butterflies	 Moths	 Flower flies	 Filth flies
<b>Color</b>	White, yellow, blue, ultraviolet	White, green	Bright red, purple	Red, purple, pink, white	white, yellow, ultraviolet	Pale, dark brown, purple
<b>Nectar guides</b>	Present	None	Present	None	Present	None
<b>Odor</b>	fresh, mild, pleasant	None, strongly fruity, or foul	Faint but fresh	Strong, sweet; most at night	Fresh, mild, pleasant	Putrid
<b>Nectar</b>	usually present	Sometimes present	Ample; deeply hidden	ample;; deeply hidden	Usually present	Usually absent
<b>Pollen</b>	Limited; often sticky, scented	Ample	Limited	Limited	Limited, often sticky, scented	Modest
<b>Shape</b>	Shallow, with landing platform; tubular	Large, bowl-shaped	Narrow tube with spur; wide landing pad	Regular; tubular without a tip	Shallow, with landing platform	Shallow, funnel-like, or complex with trap

Adapted from USDA-FS [https://www.fs.fed.us/wildflowers/pollinators/What\\_is\\_pollination/syndromes.shtml](https://www.fs.fed.us/wildflowers/pollinators/What_is_pollination/syndromes.shtml)

**Flies** are another group of pollinators that typically gets overlooked when pollinators are discussed. When fly pollination (pollinator syndrome) is discussed it usually talks about carrion (filth) flies. These flies normally visit dead animals (carrion) or dung.

**Carrion flies** are attracted to flowers that tend to be pale or dark brown and purple (resemble rotting flesh) and are shallow and funnel like or have complex trap shapes. Nectar is usually absent and pollen is limited. The smell also



*Tachinid fly on honeylocust*

tends to be putrid. These flowers are mimicking carrion, dead/rotting flesh, so the flies are attracted to it thinking it is something they will be able to lay their eggs on. These flies will typically visit the flower, realize it's not what they are looking for and quickly leave unless there is some sort of 'trap' present to keep them around longer.

**Flower flies** will tend to feed on pollen and nectar as adults and will be attracted to different types of flowers than carrion flies. Many of these flies mimic bees, some examples are syrphid/hoverflies

(Syrphidae) and bee flies (Bombyllidae). Flowers they tend to visit are lighter in color and have a more pleasant scent. Unlike flowers that are typically pollinated by carrion flies nectar is usually present.



*Syrphid (hover) flies on rose*

Since most **moths** are nocturnal, flowers they visit tend to release a strong sweet smell at night. The flowers are generally tubular and are pale red, pink, purple or white in color. Some white flowers (yucca, moonflower, Easter lily) 'glow' at night to attract moths (reflect moonlight). Flowers don't necessarily have any nectar guides and have limited pollen – moths have straw-like mouths so they cannot eat pollen, therefore pollen isn't an attraction for them. Moths can have very long tongues, so the nectaries tend to be hidden deep in the flower. Oftentimes moths will hover as



*Yellownecked caterpillar moth on thistle*

they feed, so these flowers don't necessarily have somewhere to land (lip). The nectar of moth pollinated flowers tends to be watery, because of their straw-like mouthparts moths can't risk them becoming clogged.

**Butterfly** pollinated plants tend to be bright red and purple and will also have nectar guides present. The odor of the flowers tends to be faint and fresh. Like flowers that moths visit, the nectar is ample, deeply hidden and watery. The flowers tend to be a narrow tube with a spur or have a wide landing platform. Like moths, butterflies also have a proboscis that they use to get to nectar. Butterflies land when they feed, so the flowers they visit will usually have landing platforms.



*Hairstreak butterfly on Coreopsis*

When people think of pollinators, they tend to think of **bees**. Flowers that attract bees are bright white, yellow, blue or UV. Nectar guides are often present on bee pollinated flowers. The flowers tend to have a fresh, mild, pleasant smell and they have a shallow flower shape with a landing platform. Pollen is very important to bees, they will collect it to feed their young as well as consume it themselves (adults).



*Honey bee on mint*

### **Illinois Bees**

When you mention bees to most people images of golden-yellow honey bees come to mind. However, there is a lot more to bees than the honey bee. In fact, there are over 20,000 bee species worldwide and around 500 species of bees native to Illinois.

While honey bees live in colonies that can reach 60,000 individuals and bumble bees live in colonies that can reach 400 individuals most of our native

bees (90%) are solitary bees. Unlike honey and bumble bees that have a division of labor where a queen lays eggs and her offspring perform jobs such as caring for young, foraging, etc., female solitary bees do all of those jobs by themselves.

A female solitary bee will select a place to build her nest. Unlike honey bees that live in larger cavities (which is why we are able to keep them in hives) most (70%) of our solitary bees nest in the ground while others may nest in wood, hollow or pithy branches. Once she has selected a location she will create nest cells. Inside of these cells she will place a ball of pollen mixed with nectar and lay an egg on it. When the egg hatches the larva will feed on the pollen ball. Generally these bees will not emerge until the following year.

Some of the more common native bees in Illinois include bumble bees, carpenter bees, leafcutter and sweat bees.

**Bumble bees** get their name due to the buzz they produce while collecting pollen (buzz pollination). They are social insects and colonies can have 50-400 individuals. At the end of summer, colonies will die off and mated queens will hibernate. They are cavity nesters, generally in abandoned underground rodent burrows, and are active from spring through late fall. They are robust bees that are hairy with yellow, black, white, brown or orange bands.



*Bumble bee on purple coneflower*

**Eastern carpenter bees** are commonly considered pests because they often construct nests in wood of homes and other buildings (painting wood can prevent this). They are active from spring through fall. Due to their large size they primarily visit large



*Eastern carpenter bee on zinnia*

and open-faced flowers. They look similar to bumble bees. However, the top of the abdomen of carpenter bees is bare, black and shiny.

**Leafcutter bees** cut pieces of leaves or petals to line the walls of their nests. They are solitary nesting and create their nests in pre-existing wood and other plant cavities. Leafcutter bees are active from early to late summer.

They are medium to large bees, with smoky colored stout bodies with pale bands on their abdomen.



*Leafcutter bee on Viburnum*

Many species of **sweat bees** are attracted to human perspiration which they will consume for the salt contained in it, thus their common name. Most sweat bees nest in the ground. Sweat bees can be found from spring through fall, with most species being active during the summer. They are small to medium sized bees and are often brightly colored and metallic with colors ranging from green to red and yellow.



*Sweat bee on goldenrod*

Other native bees include yellowfaced bees, mason bees, small carpenter bees, longhorned bees, mining bees, cellophane bees, and squash bees.

### **Pollinator Garden Tips**

Many pollinator populations are in decline and this decline is attributed most severely to a loss in feeding and nesting habitats. There are a variety of things people can do to make their environment more appealing to pollinators.

**1. Choose heavy pollen and nectar-producing plants.** Pollinators tend to prefer native plants that have higher pollen and nectar resources compared to cultivated varieties.

**2. Plant a variety of flowers, for season-long blooming, and blossom shapes.** Different pollinators are attracted to different types of flowers and different pollinators are active at different times of the year.

**3. Plant in clumps rather than single plants.** Groupings of plants are more attractive to pollinators than solitary plants.

**4. Be willing to accept plant damage.** Leafcutter bees cut up leaves and caterpillars will eat foliage.

**5. Provide habitat for nesting and egg-laying:**

- Layers in the landscape. Shrubs, tall grasses, and low growing plants – different pollinators prefer different layers.
- Small patches of bare ground, loose sandy soils, slopes or embankments – 70% of native bees nest in the ground.
- Allow an untidy garden – leave 12-18” of flowers stems behind. 30% of native bees nest above ground in cavities such as hollow flower stems.
- Leave dead tree trunks in your landscape for wood-nesting bees and beetles.

**6. Rethink the use of pesticides:**

- Follow Integrated Pest Management (IPM) practices, use pesticides only when necessary.
  - Don't apply to plants when they are in bloom.
- Apply when pollinators are less active – dawn & dusk.
- Avoiding drift and runoff.
- Select pesticides known to be less harmful to pollinators.

**For more information on pollinators and how you can help them, visit [pollinators.cropsciences.illinois.edu/](http://pollinators.cropsciences.illinois.edu/).**

Ken Johnson  
*Extension Educator, Horticulture*

David Robson  
*Extension Horticulturist*

Elizabeth Wahle  
*Extension Educator, Commercial Agriculture*

Phil Nixon  
*Extension Entomologist*

Martha Smith  
*Extension Educator, Horticulture*