

# **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



Nectar guides on blanket flower (dark areas on petals)

flowers such as daisies and asters.

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
Color	White, yellow, blue, ultraviolet	White, green	Bright red, purple	Red, purple, pink, white	white, yellow, ultraviolet	Pale, dark brown, purple
Nectar guides	Present	None	Present	None	Present	None
Odor	fresh, mild, pleasant	None, strongly fruity, or foul	Faint but fresh	Strong, sweet; most at night	Fresh, mild, pleasant	Putrid
Nectar	usually present	Sometimes present	Ample; deeply hidden	ample;; deeply hidden	Usually present	Usually absent
Pollen	Limited; often sticky, scented	Ample	Limited	Limited	Limited, often sticky, scented	Modest
Shape	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

**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



Syrphid (hover) flies on rose

pollinated by carrion flies nectar is usually present.

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



Hairstreak butterfly on Coreopsis

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.

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



Bumble bee on purple coneflower

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.

Eastern carpenter bees are commonly considered pests because they often construct nests in wood of homes and other buildings (painting wood can



Eastern carpenter bee on zinnia

prevent this). They are active from spring through fall. Due to their large size they primarily visit large



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.

 Choose heavy pollen and nectar-producing plants. Pollinators tend to prefer native plants that have higher pollen and nectar resources compared to cultivated varieties ('nativars'). Many ornamental, annual bedding plants, and

- garden herbs are good sources of pollen and nectar. Trees can also be important food sources, especially early in the year.
- 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. However, avoid heavily modified flowers such as double blooms.
- **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/.

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