The yellow-plumed goldenrod hosts a variety of insects and provides fall color as other plants fade away.

Autumn Gold

Story By Carol McFeeters Thompson
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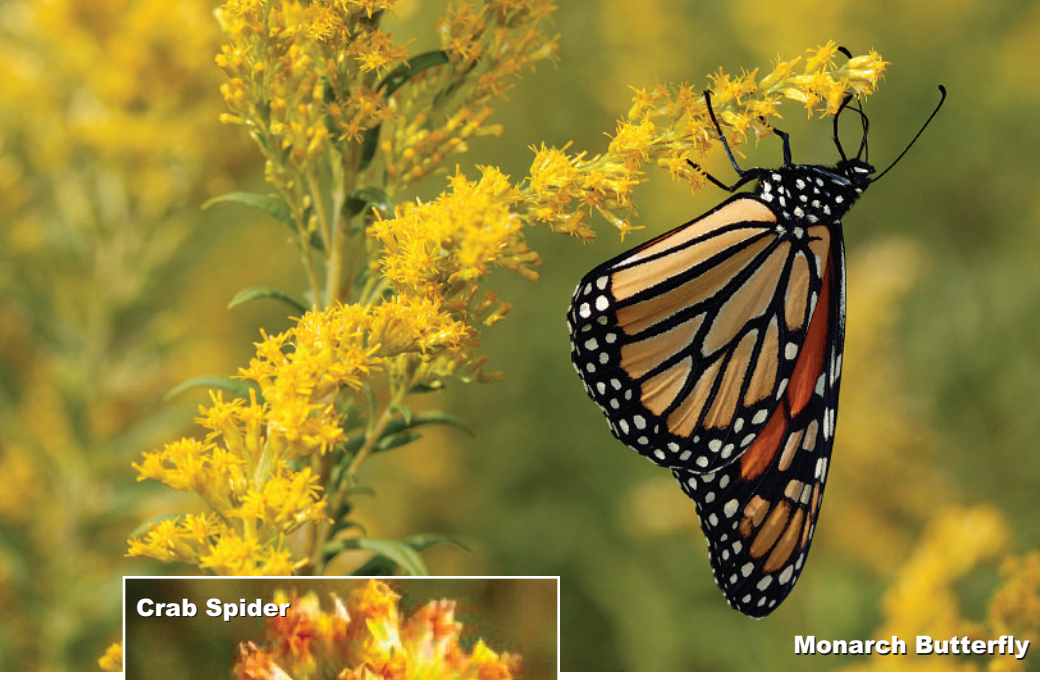
September meadows across Illinois glow with sunny yellow plumes of goldenrod bobbing in the breeze, the air above them alive with soaring russet monarchs and buzzing bees. Even the autumn sunlight takes on a special golden quality that helps to make this colorful season a favorite of many.

Others falsely dread the showy yellow blooms covering meadows, blaming goldenrod for their autumn hay fever. (The real culprit is the inconspicuously green-flowered ragweed, dependant on the wind for pollination and producing large quantities of light, dry pollen that triggers sniffles, sneezes and watery eyes.)

Goldenrod pollen is much heavier and does not ride the wind as ragweed pollen does but instead relies on insects for pollination. As insects move across the flowers, the heavy pollen sticks to their bodies and is transferred from flower to flower. Insect-pollinated flowers are generally yellow or blue-violet, offer flat surfaces to serve as landing platforms, and group lots of nectar-rich flowers together in big, showy flower heads. The alluring mass of goldenrod is a composite formed of many tiny tufts, each containing two different kinds of flowers. In the center of a tuft are the disk flowers, which have both male and female parts. Around the perimeter lies a circle of flat ray flowers, each with only female parts. Both flowers produce seeds when pollinated. A soft, silky parachute attached to each seed helps to disperse it on the wind.

Fields of showy, blooming goldenrod attract a diversity of insects—and false blame for autumn hay fever.



(Photo by Bev Wigney)

Boldly colored monarchs are easily seen fluttering between goldenrod plants, but finding the cryptic crab spider takes patience and closer examination.

It has been said that no other flower attracts as many kinds of insects as goldenrod. Hover flies and bees are among goldenrod's principal pollinators.

Hover flies resemble bees, but can neither sting nor bite and possess only one pair of wings while bees have two pair. Often seen hovering stationary over flowers, hover flies eat nectar, inadvertently getting pollen on their legs and bodies, carrying it from flower to flower.

For bumblebees, pollen is an excellent source of protein. Using brushes on their feet to gather it and combs on their legs to collect it, bumblebees can often be observed carrying bright orange balls of goldenrod pollen in pollen baskets on the backs of their hind legs.

Just as goldenrod flowers are adapted in shape and color to attract insects, some insect species are specially adapted in shape and color to live in goldenrod flowers.

Yellow and brown markings camouflage the Pennsylvania leatherwing from predatory birds while it feeds on goldenrod pollen and nectar.

The jagged ambush bug is cryptically camouflaged on goldenrod flowers. Hidden by its mottled gold, green and brown coloring, the ambush bug lies in wait for a careless insect to wander within reach of its powerful forelegs—adapted for seizing and holding prey. Immobilizing bumblebees, wasps and honeybees by injecting them with saliva through a piercing and sucking beak, the ambush bug is able to capture insects much larger than itself.

The Pennsylvania leatherwing is a soldier beetle (similar in shape to a "lightning bug") that is abundant on goldenrod. Gold and brown markings allow it to blend into the flower, providing protection from birds. The carnivorous leatherwing larvae eat grasshopper eggs and soft-bodied insects such as small caterpillars. Adults are omnivorous, depending on pollen and nectar as well as small insects.

Known as a crab spider for its habit of holding its legs outstretched to the sides like a crab, the goldenrod spider scuttles sideways through flower tufts. Goldenrod spiders do not spin webs or snares; they wander from flower to flower in search of prey they capture by ambush, relying on yellow coloring for camouflage. Venom injected through the fangs immobilizes prey that venture too close. A butterfly hanging motionless from a flower often has fallen prey to a crab spider.

Some insects provoke goldenrod plants into building them a safe, well-stocked pantry. Living inside the plant, they stimulate it to create unusual growths, called galls. These may be shaped like a round ball or elliptical mass in the stem, a rosette of leaves at the top of the plant, or a raised black dot on a leaf.

The ball gall is a globular stem swelling about an inch in diameter made by a fly with brown-marked wings. This gall fly deposits an egg in the stem tis-

Black-and-Yellow Argiope

(Photo by Carol Thompson McFeeters.)

Sitting head-down at the hub of its goldenrod-based web, the common, and distinctive, black-and-yellow garden spider waits for its next meal.

sue below the growing tip of the plant. Glandular secretions produced by the adult insect stimulate abnormal plant growth and the formation of the gall. The developing insect secretes additional fluids while it feeds, so the gall continues to grow until the larva stops feeding. The larva chews an exit tunnel to the surface, without breaking through, pupates just below the surface and emerges as an adult in the spring. Downy woodpeckers often feed on these galls during the winter months.

The elliptical gall is spindle-shaped rather than globular and is stimulated by a gall moth. The interior of the gall is kept smooth and hollow as the larva devours the plant tissue. It has been suggested that the exit hole for this gall often faces north, lack of intense sunlight keeping it soft and moist to facilitate escape.

The goldenrod bunch gall is produced when a gall midge deposits an egg at the growing tip of a main shoot. The cell of this midge larva is in the center of a cluster of shortened, deformed leaves that appear as a rosette at the tip instead of growing evenly along the normal length of the stem.

The shape and location of goldenrod galls helps identify the insect that created it. Ball and elliptical galls are located on the stem while the bunch gall creates a rosette on the tip of the main shoot.

Although it welcomes insects, the goldenrod plant produces chemicals that repress the growth of competing plants. Each goldenrod plant sends out rhizomes in a spoke-like pattern, forming a circular cluster of genetically identical goldenrod.

A field of goldenrod is a fascinating place to take a late summer walk. Take along a hand lens to see how many different members of the goldenrod community you can find—and enjoy some autumn gold.

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Ball Gall

(Photo by Carol Thompson McFeeters.)

Gall Fly

(Photo courtesy Patrick Coin, nature@coins.com.)

Elliptical Gall

Bunch Gall

(Photo by Carol Thompson McFeeters.)