

Good for Flowers and So Much More

While bees are the most efficient pollinators and butterflies the most noticeable, they are not the only pollinators. Beetles, wasps, and flies also help with pollination, but they are possibly more important as pest control. As predators or parasitoids, they eat other insects and help keep pest populations in check. Their work, and that of other beneficial insects, is essential in natural systems, gardens, yards, parks, and farms.



Soldier beetles are pollinators as well as predators. While adults visit flowers to eat nectar and pollen, larvae hunt through leaf litter for small insects and worms. Many predators have very different diets from the larval to adult stages, including the goldenrod soldier beetle pictured here.



Tiger beetles are fast. Five mph may not seem speedy to us but that is more than 120 body lengths per second for a beetle. Can you do that? In fact, they run too fast for their eyes to see. They repeatedly pause to reorient on the prey before launching into pursuit again.

Predators hunt and consume other insects. Some are predaceous in one life stage, such as flower flies whose larvae eat aphids and adults drink nectar, while others are active predators throughout their life. Many predators are not picky and will feed on a wide range of insects larger or smaller than themselves. Some, like tiger beetles, run fast and chase down their prey. Lady beetles move more slowly but will methodically chew their way through a whole colony of aphids. (A single lady beetle may eat up to 5,000 aphids in its lifetime!) Other predatory insects include soldier beetles, ground beetles, lacewings, big-eyed bugs, assassin bugs, minute pirate bugs, and predatory wasps.



Lady beetles love aphids. They eagerly feed on soft-bodied insects both as larvae and adults.

(Photograph: rockerBOO, Flickr.com.)

Pollinators BENEFICIAL Insects

Parasitoids are insects that lay their eggs on or inside another insect. The larvae of parasitoid insects (some wasp, fly, and beetle species) feed on—and ultimately kill—the host insect before emerging as adults. Most parasitoids are specialists, meaning they only attack one or a few host species. For example, tephritid wasps are primarily parasitoids of scarab beetle larvae, including Japanese beetles. Because of their lifestyle and often small size, parasitoids can be easily overlooked, but we'd quickly notice if they weren't around.



This tiny scelionid wasp just emerged from an egg, but not its own. These parasitoid wasps specifically seek out stink bug eggs in which to lay their own eggs.

(Photograph: David Cappaert, Bugwood.org.)

The Importance of a Well-Balanced Diet

Flowers are important to these predators and parasitoids because they require other food in addition to prey. Many of them feed on nectar or pollen during one or more of their life stages; nectar fuels the hunt and pollen is a supplemental source of protein for some predatory insects when prey is in short supply or during egg laying. Flowers enable them to complete their life cycle.

The larval or immature stages of these insects are often found in different locations from adults due to differences in diet. For example, flower fly larvae may be found feeding on aphids and other small insects on plant stems, whereas adults will be found primarily on flowers, eating nectar or occasionally pollen.



*Like other syrphids, the traverse flower fly (*Eristalis transversa*) has a very different diet as an adult and larva. Adults visit flowers for nectar and pollen, but as larvae they feed on small insects and insect eggs.*



More than an inch long and with a distinctive cog-like crest, the wheel bug is easily identified. But be careful if you find one. They are just as likely to try to suck juices from you as any insect prey!



Put Out the Welcome Mat

In addition to flowering plants, many beneficial insects also require shelter for overwintering or for egg-laying. Predatory wasps (such as potter, thread-waisted, digger, mud dauber, and sand wasps) will dig underground, occupy cavities, or build their nests using pieces of grass, mud, or resin. Some beetles need leaf litter or clumps of bunch grasses in which to reproduce and overwinter.

Land management practices can greatly impact these beneficial insects in both positive and negative ways. Insecticide use has negative effects, but tillage, and mowing of ditches and fence lines also can harm beneficial insect populations by depleting their needed food, shelter, or overwintering habitat. On the other hand, adding native flowering trees, shrubs or wildflowers, including on roadsides, creates habitat that supports these insects.



Potter wasps (above) create beautiful earthen cells (right) attached to plant stems.

There are additional benefits to welcoming these insects. The same habitats that support predators and parasitoids also support a diverse array of pollinators, including bees and butterflies. All of these insects in turn provide food for other wildlife such as songbirds and game birds. Native shrubs, grasses, and wildflowers can also reduce soil loss and improve water quality by filtering runoff from cropland or urban landscapes.



Smaller than a grain of rice, pirate bugs prefer to feed on aphids, whiteflies, caterpillars, and other soft-bodied insects, but will drink nectar when prey is scarce.

(Photograph: USDA-ARS, Jack Dykinga.)



Paper wasps scrape wood fibers from fences, decks, and other exposed timbers, which they mix with saliva to make their nests, hence their name. Each cell is supplied with paralyzed prey (like caterpillars) to feed their offspring.

Be a
good neighbor
to helpful insects

Insects that prey upon or parasitize crop pests tend to be more susceptible to insecticides than pests. Strategies to reduce impacts of insecticides to beneficial insects include:

- Use insecticide only when pressure from pests provides no other option
- Target insecticide use to where a pest problem exists
- Use chemicals with short residual toxicity or specifically targeted for that pest
- Reduce insecticide drift to keep applications on target



This thread-waisted wasp (Podalonia spp.) sips nectar from butterfly milkweed (Asclepias tuberosa). Nectar is high-energy, fueling the wasp's hunting activities.

The Value of Roadsides

Flowering plants along roadsides are important sources of food and native grasses and undisturbed soil serve as shelter for beneficial insects. Roadsides that include a diversity of native plants with a succession of blooming flowers throughout the growing season provide the best habitat for the insects that provide natural pest control. Roadside habitat can also support populations of beneficial insects that provide pest control in nearby crop fields.

Practices such as Integrated Roadside Vegetation Management (IRVM) can benefit predators, parasitoids, and pollinators as well as their habitat while meeting the functional requirements of roadside vegetation. IRVM is a management system that promotes the use of hardy and adapted native grasses and wildflowers in combination with practices such as mowing, burning, and the targeted use of herbicides to control weeds. Due to their extensive root systems, native plants help improve soil quality, water quality, and provide excellent erosion control benefits.

The adults of green lacewings fly with glass-like wings from flower to flower to drink nectar and seek places to lay eggs. Their larvae are fierce predators, scurrying across foliage in search of soft-bodied prey such as aphids or whiteflies.

*(Photo: The Xerces Society/
Sarah Foltz Jordan.)*



The Iowa Living Roadway Trust Fund (LRTF) was established by the Iowa General Assembly in 1989 and is administered by the Iowa Department of Transportation. Through grants to county, city, and state agencies, the LRTF's mission is to provide assistance to implement IRVM. The Iowa Department of Transportation, with support from the Living Roadway Trust Fund, has planted more than 100,000 acres of state and county road rights-of-way with native plants.



Not all "beneficial insects" are insects! Spiders, mites, and harvestmen —arachnids rather than insects— all have a role to play in controlling pests and maintaining a balanced environment.



A special thank you to Bryan E. Reynolds for his generous contribution of photography. All photos on this poster are copyrighted to Bryan unless otherwise noted.