

# Beneficial Insects

## What is a Bug?

Many people refer to insects as “bugs”. A bug or true bug is defined as any insect of the order Hemiptera (suborder Heteroptera) that have sucking mouthparts and forewings thickened at the base. The true bug develops through incomplete metamorphosis meaning its nymph stage resembles the adult bug. This is unlike butterflies and moths (order Lepidoptera) that transform into caterpillars (complete metamorphosis). Bees, flies, wasps, and beetles also completely change form from egg to larvae to adult.

Many true bugs are economic pests (i.e. cinch bug) but not all. The assassin bug for example is a beneficial insect that controls many agricultural pests. In reality, more than 90 percent of all insects are either beneficial or do no harm to plant, animal or human life.

## Pollination Services

Insects like bees, flies, beetles, butterflies and moths are essential for pollinating the food we eat and ensuring the survival of our indigenous trees, shrubs and plants that in turn clean our water sources and the air we breathe. Additionally, these plants provide habitat for birds and wildlife.

## Controlling Harmful Pests

Many insects, such as the ones described below are predators of harmful garden and agricultural pests. Eliminating these beneficial insects with pesticide applications only serves to eliminate the very creatures whose purpose it is to control harmful pests. Pesticides kill the beneficial insects but some pests, over time, develop resistance to a particular chemical. As a result, stronger and stronger formulations are needed to control them putting us and our children at even greater risk.



An attractive pollinator, the Harvester butterfly and her caterpillar who eats pesky aphids.

## Food for Wildlife

Many insects are food for birds, amphibians and mammals. Many people consider moths and their caterpillars pests. In truth adult moths are a very important for both pollination services as well as in providing food for bats, martins, flycatchers, whippoorwills and other vertebrates. Moth caterpillars are enormously important to the food web supporting many animal species. These caterpillars are especially valuable as food for baby birds because they are soft, full of nutrients, and can be easily digested. Baby birds grow quickly so parent birds have the exhausting job of finding and feeding caterpillars for many weeks when babies are nesting and even after fledging the nest.

## The Food Chain

Just as we do, insects need to eat. And, they eat plants. But in natural ecosystems they never become a problem because they are food for other insects, birds, amphibians, reptiles and mammals. Only when we unbalance the ecosystem by depleting habitat and misusing chemicals do they become problematic. It bears repeating that in nature and in our own yards the majority of insects are beneficial and do no harm. Furthermore, pests have to be numerous in order to cause damage to plants. Recognizing the good and the bad is essential.

## Integrated Pest Management

Integrated Pest Management (IPM) is a widely accepted environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM's directive states that the least harmful method of controlling pests should always be considered prior to applying toxic substances. IPM does not condone the use of broad-spectrum insecticides. Mechanical methods such as hand picking or washing, row covers, and crop rotation are encouraged. Biological control using beneficial insects is a widely respected IPM method. It is important to know your plant, its pest and appropriate timing for control.

Pictured below are some very important insects for pest control. These are the "good guys". Protect them and allow them to do their job.



Aphidius Wasp

Most **aphidius wasps** are about 1/8" long and dark in color with clear wings. They do NOT sting.

Their name gives you a hint about who they eat. It's aphids.

They are so scary to aphids that when they see the wasp, they often fall to the ground rather than be eaten.



Assassin Bug

There are hundreds of species of **assassin bugs** throughout North America. They are usually brown or black with large bristly front legs. Most measure about 1/2" long. They can bite if handled roughly.

They eat aphids, cabbage worms, beetles, cutworms, earwigs, four-lined plant bugs, Japanese beetle, lace bugs, Mexican bean beetle, tobacco budworms, tomato hornworms and many caterpillars.



Big Eyed Bug

**Big eyed bugs** are very small, measuring only 1/8" long. They have wide heads with big bulging eyes. They are usually gray, black or brown with clear wings and their bodies are flattened.

Big eyed bugs help rid the garden of aphids, cabbage loopers, caterpillars, chinch bugs, flea beetles, Mexican bean beetles, spider mites, thrips, whiteflies, and many eggs of bad bugs.



Damsel Bug

**Damsel bugs** are dull brown, tan or gray with narrow bodies and a long curved "snout" and bulging eyes. They resemble small assassin bugs.

They eat aphids, asparagus beetles, cabbage worms, tobacco budworms, cutworms, Colorado potato beetle larva, four lined plant bugs, sawfly larva, spider mites, whiteflies, thrips, leafhoppers, and many insect eggs.



Ground Beetle

**Ground beetles** have shiny hard shells. They can be between 1/8" to 1-1/2" long. Many of them are dark in color but a few are green, blue, gold or red. Most have large mouth parts called mandibles for capturing prey. They feed at night and hide under rocks and logs during the daytime.

Their larvae feed on many insect pests for several weeks before becoming adult beetles. They prey on slugs, root maggots, cutworms and other pest on the ground.



Hover or Syrphid Fly

Adult **hover flies** look like small wasps with black and yellow stripes and a white belly but on closer inspection they have only two wings and large eyes as do all flies. They hover like a hummingbird. They can NOT sting. Adults range in size from 1/4" to 1/2".

They are both important pollinators and predators of bad bugs. As larvae they can eat as many as 500 pests before becoming adult flies. Their larvae eat aphids.



Green Lacewing

**Lacewings** are beautiful, light green with very large transparent wings, long threadlike antennae and golden eyes. They can be up to 1" in length.

As larvae they can eat up to 100 aphids per day, earning them the nickname "aphid lions". They also feed on scale insects.

Adult lacewings do not feed on insects. They eat nectar and pollen and "honeydew" produced by pests like aphids.



Lady Beetle and Larva

**Lady Beetles** are ¼" long with rounded bodies and black spots. Their wing covers are bright orange to red with white markings on their "shoulders". There are over 450 species of lady beetles found throughout North America and each species has a different number of black spots. Lady beetle larvae look like tiny colorful alligators.

Adult lady beetles and their larvae eat aphids, asparagus beetle, lace bugs, mealy bugs, Mexican bean beetle larvae, scale, thrips, spider mites, whiteflies, and many insect eggs.



Minute Pirate Bug

**Minute pirate bugs** are very tiny, measuring only 1/8". They are oval shaped and black color with white wing patches. They are very fast moving.

Adults and nymph pirate bugs help rid your garden of aphids, small caterpillars, lace bugs, Mexican bean beetle larvae, scale, spider mites, whiteflies and many insect eggs including tobacco budworm, cutworm, corn earworm.



Parasitic Wasp

**Parasitic wasps** do NOT sting. They usually measure between 1/32" and ½", though a few are larger. They look like they have a stinger but it is really an ovipositor, a part of the body that lays eggs.

Parasitic wasps rid your garden of aphids, beetle larvae, bagworms, cabbage worms, gypsy moth caterpillars, beetles including Japanese beetles, leaf miners, mealy bugs, sawfly larvae, scale, tomato hornworm, and many more.



Dragon Fly

**Dragon flies, Damselflies**, and their larvae feed on mosquitos. Harmless to humans, they do not sting.

Damselflies are small and slender bodied. They fold their wings above their abdomen when at rest. Skimmers are the largest and best known family of dragonflies. Most have patterned wings. Darners include the largest of our dragonflies, they have huge eyes and like to hang vertically.



Firefly

**Fireflies**, AKA Lightning bugs, are neither flies nor bugs. They are actually beetles. Their glow is produced in a chemical reaction caused by an enzyme. No heat energy is lost from their bodies when producing their glow.

Firefly larvae are predators of snails and slugs.



Soldier Beetle

**Soldier beetles**, AKA leatherwings, are abundant on flowers and foliage. They have soft wings and are good fliers.

Valuable as pollinators, they eat many aphids and larvae of other insects. The goldenrod soldier beetle feeds on root maggots and corn earworm.



Tachinid Fly

**Tachinid flies** are North America's largest and most important group of parasitic flies. They resemble small house flies and may be covered with bristly hairs. They can measure from 1/3" to 3/4" in length.

They help rid your garden of many harmful caterpillars, beetles, and worms including Japanese beetles, sawfly larvae, squash bugs, tobacco hornworms, four line plant bugs, and more.



Robber Fly

Adult **robber flies** measure up to 1-1/2". Most are gray to black. They have an elongated body that tapers to the rear with bristled legs.

They catch prey on the wing. Adults and larvae eat Colorado potato beetles, four lined plant bugs, Japanese beetles and Mexican bean beetles.



Long-legged Fly

There are about 7,000 species of **long-legged flies**. They are small in size with colors ranging from metallic green, blue, copper, and bronze.

They can be seen darting across leaves feeding on mites, aphids, and tiny larvae.



Spider

There are 38,000 species of **spiders** in the world. They are not an insect but an arachnid, as they have eight (8) legs (insects have only six). Spiders can be brown to white or yellow and can have many patterns of bright colors. Some are hairy and some are smooth. They have excellent hearing, sense of smell and touch.

Many are not discriminating eaters and will readily capture beneficial insects and pests.



Daddy Long Legs

**Harvestman, AKA Daddy Long Legs** are classified as arachnids of the order Opiliones. Contrary to urban myths, they are not venomous.

They prey on insects and other arthropods. They also scavenge dead insects and drink plant juices.



Six Spotted Tiger Beetle

There are more than 2600 species of **tiger beetles** in North America. They work during the day as opposed to ground beetles who work the night shift. They are swift hunters and beneficial predators of pest insects. Some are endangered due to habitat destruction.

One species, the six-spotted tiger beetle is abundant in spring on forest paths. He is a striking metallic green color with six white spots on his sides.



Spined Soldier Bug

The **spined soldier bug** (genus Podisus) is a predatory stink bug that feeds on a wide variety of field and garden pests including Mexican bean beetle, Colorado potato beetle and imported cabbageworm as well as sawfly larvae and grubs.

The spined soldier bug resembles the pest stink bugs, especially the Marmorated stink bug. but can be identified as a “good guy” by the large spikes on his “shoulders”.

NOTE: Many stink bugs are damaging to plants but our native stink bugs are kept in check by natural predators such as birds, frogs, parasitic wasps, and spiders.

Large populations of stink bugs, especially those found in your home in late winter, are brown marmorated stink bugs (*Halyomorpha halys*). This pest was accidentally introduced to America. He hails from China, Japan, the Korean Peninsula, and Taiwan.