



Beneficial Insects

Most insects in your landscape, orchard, or vegetable garden do not feed on or harm plants. Insects need to be somewhere, and sometimes they are just passing through or resting as they go about their business. Yes, there are plant feeders of which most gardeners are ultra-aware and call “pests”. Other insects are looking for a meal and eat the “pest” insects. These beneficial insects are either predators that kill and feed on pests or parasitoids which have larvae that parasitize and may kill the host but live freely as adults. Insect pollinators are also considered beneficial. It is important to understand and recognize beneficial insects so they can be encouraged and not inadvertently killed during pesticide applications or other gardening activities.

Most gardeners are aware of the predatory habits of lady beetles (ladybugs) and can identify the adults, but they may not be familiar with the egg masses and larvae which are often described as resembling a small Gila monster. Similarly, lacewing adults are often recognized when they fly to porch lights, but the eggs and larvae are less conspicuous. However, lacewings are also beneficial predators of many pest insects.

Green lacewings (*Chrysoperla* spp.) are common in Arizona gardens, orchards, and landscapes. Adult green lacewings are delicate, pale green insects between 1/2 to 3/4 inch long. Their four wings have many veins, which gives them the net-like or “lace” appearance. They are attracted to lights at night and may be mistaken for moths except they have a characteristic fluttering flight when disturbed. Green lacewings also have an objectionable odor when handled. Brown lacewings (*Hemerobius* spp.) are also found in Arizona but are not as common and are roughly half the size of green lacewings.

Green lacewings lay their pale green eggs on the tips of threadlike stalks on the underside of leaves. These stalks partially prevent emerging lacewings from eating other emerging lacewings. Brown lacewing eggs are not on stalks. Both green and brown lacewing larvae hatch within a few days. They are about 1/4 inch long, alligator-shaped, and light brown or grayish in color. They have six legs, with large sickle-shaped mandibles and are voracious feeders able to consume large numbers of aphids (they are also called aphid lions). Green and brown lacewing larvae also feed on other insects, including moth eggs, mealybugs, small scales, mites, whiteflies, lace bugs, other small insects, and each other, when nothing else is available.

Larvae of both species feed for two to three weeks before pupation. When the larvae mature they form a small silken cocoon on an inconspicuous plant part in which they pupate. Adults emerge in about five days, but some species may overwinter in the cocoon. Green lacewing adults are active at night and feed on pollen, nectar and honeydew (the exudate of aphids and other sucking insects). Brown lacewings continue to feed on small insects as adults.



Green lacewing adult (*Chrysoperla* spp., Alton N. Sparks, Jr., University of Georgia, Bugwood.org).



Green lacewing eggs on a willow leaf (*Chrysoperla* spp., Whitney Cranshaw, Colorado State University, Bugwood.org).



Green lacewing larva (*Chrysoperla* spp., Whitney Cranshaw, Colorado State University, Bugwood.org).

Lady beetles, often called lady bugs, are the most commonly known of all beneficial insects. Both adults and larvae feed on many different soft-bodied insects with aphids being their main food source. Knowing that lady beetles will arrive in your garden helps you tolerate periodic aphid populations. Learning to recognize the eggs and stages of the lady beetle life cycle will help you monitor their populations and reduce unnecessary applications of insecticides.

Most people recognize adult lady beetles by their shiny, convex, dome shape. They are often orange with black spots. However, given over 500 species found north of the Mexican border, there is much variation in color: from bright colors with spots to dark colors with few or no markings. Most lady beetles are predaceous as both larvae and adults and vary in adult body length between 3 to 7 mm.

Aside from aphids, lady beetles can also feed on many other pests such as soft-scale insects, mealybugs, spider mites and eggs of the Colorado Potato Beetle and European Corn Borer. One lady beetle larva will eat about 400 medium-size aphids during its development to the pupal stage. An adult will eat about 300 medium-size aphids before it lays eggs. About three to ten aphids are eaten for each egg the beetle lays. More than 5,000 aphids may be eaten by a single adult in its lifetime.

Usually the life cycle from egg to adult requires about three to four weeks, or up to six weeks during cooler spring months. In the spring, overwintering adult females find food, then lay from fifty to three hundred eggs in or near aphid colonies. Egg masses are small, bright orange ovals laid on end in groups. Eggs hatch in three to five days, and larvae feed on aphids or other insects for two to three weeks.

Larvae are multi-colored, often mostly blue with red or orange markings and resemble little alligators (or in Arizona, Gila monsters). Larvae of most species go through four instars (stages between molts) looking similar but increasing in size each time before they pupate. The pupae are often attached to leaves, tree trunks, and structures and look similar to the larvae but are stationary and rounded. The pupae emerge as adults in seven to ten days. There may be five to six generations per year.

Convergent lady beetles are one of the most common native species. The common name refers to a pair of white convergent dashes on the prothorax (the round plate behind the head). Another common species is the twicestabbed lady beetle. The adults of this species are black with a red spot on each side of their back.

In Arizona, we have many other lady beetle species. Do not transport lady beetles from one place to another or purchase them to release in your garden. If there is food available or habitat is suitable, they will appear at the proper time. Furthermore, respect and conserve lady beetles (and other beneficial and/or benign insects) by only using insecticides when absolutely necessary and targeting the pest species as closely as possible to minimize impact to non-target organisms.

When you see beneficial insects or their signs, give serious consideration before using insecticides. Beneficial insects are slower to recolonize after insecticide applications and using them may give a competitive advantage to the pest species.



Eggs, larva, pupa, and adult of convergent lady beetle. Photo by: Jack Kelly Clark, UC IPM, <http://ipm.ucanr.edu/>.

February 19, 2023

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