

## Beneficial Insects

Many insects are important to backyard gardeners, and provide pollination services and reduce unwanted insects through predation, parasitism or competition.

### Pollinators

Almost all fruit-bearing plants are pollinated by insects during the flowering stage. Popular garden plants such as tomatoes, peppers, cucumbers, beans, as well as orchard crops like peaches, apples, citrus, and almonds all rely on insect pollination to produce healthy fruit.

**Bees** Domesticated European honey bees have been very effective for large scale and commercial pollination needs, but native bees such as bumble bees, leaf-cutter bees, orchard bees, alkali bees, miner bees, and sweat bees are very important to backyard gardeners. There are more than 1500 native bees in North America. Check your gardens for the familiar large, fuzzy bumblebees, shiny, black carpenter bees, small, metallic-green sweat bees and medium-sized, blue-black orchard bees. Many of these bees nest in the ground. **Covering sunny soil surfaces with mulch or bar will eliminate nest areas and ultimately the bees themselves.**

**Butterflies and Moths** There are about 250 species of butterflies in California. In addition to pollinating many familiar annual and perennial garden plants, they are a beautiful sight during the warm summer months. Many moth-pollinated flowers make a nice addition to a garden and produce an attractive odor around dusk.

### Predators

Predators are animals that consume many other animals during their lifetime. Many predators are useful in the garden because they eat other insects that we consider pests. Quite a few insects are predators as larvae, and their adults may feed on nectar, others are predators their whole life.

**Ladybugs** These small predators are usually very welcome in gardens because ladybug larvae and adults eat aphids, mealy bugs, and mites. Both adult and larval ladybugs (Family Coccinellidae) are effective predators of garden pests. There are commercially available sources of ladybugs these days, but purchasing them has its drawbacks. Many of the commercial providers of ladybugs in the

Central Valley collect the insects locally from the Sierra and the foothills during the cool fall months.

However, these insects are "hardwired" to move west (downhill) as the growing season begins in the Central Valley. If you release "packaged" ladybugs into your garden at the beginning of the season, you may find that they move westward during the first few weeks. Your neighbors to the west may thank you, but your own garden might end up ladybug free unless someone east of you has released them

**Lacewings** Adult lacewings are familiar gauzy-winged green or brown insects. The grayish-brown larva, often called an aphid lion, is 3/8 inch long, with sharp curved jaws that extend beyond its head. The larvae feed on aphids, scales, mealy bugs, thrips, mites, and insect eggs, and can eat 100 or more insects a day.

**Predatory Flies** Hover flies and robber flies are medium-sized flies that resemble bees, but don't sting. The adults are often found hovering over flowers. Larvae of most species feed on aphids and grasshoppers, as well as the young of social insects like termites and ants.

**Ground Beetles** The family of ground beetles (Carabidae) contains hundreds of species. Though they differ in size, shape and color, most are flat, dark and shiny. They hide under stones, logs, bark, and debris, and rarely fly, preferring to run on the ground surface. Most hide during the day and feed at night. The majority of ground beetles prey on insects (especially caterpillars of tree pests) or snails.

### Parasitoids

Parasitoids are insects that typically feed on a single host during their lifetime (this is different from predators who consume many animals during their lifetime). Most parasitoids consume other animals during the larval stage. The vast majority of parasitoids are small-to-minute wasps that do not sting humans or other animals. In general, an adult parasitoid deposits one or more eggs into or onto the body of a host insect. The larva that hatches from each parasitoid egg feeds on the host insect. Most parasitoids are highly host-specific, laying their eggs on or into a single developmental stage of only one or a few closely related host species. Common agriculturally important parasitoids include members of the wasp families Braconidae and Ichneumonidae.