



Beetles

Although not usually greenhouse pests, beetles are found feeding on plants in outdoor production and retail yards, cut flower fields, and customer's gardens in Connecticut. Beetles are a large group of insects characterized by hardened forewings. Both adults and larvae have chewing mouthparts that cause plant damage. Leaf feeding beetles such as lily leaf beetles and scarab beetles are important pests in herbaceous perennial production. Some other damaging beetles include tortoise beetles, redheaded flea beetles, spotted and striped cucumber beetles, larvae of click beetles (wireworms), and blister beetles.

Leaf feeding beetles

Lily leaf beetles

The lily leaf beetle (*Liloceris lili*) was introduced into the U.S. in 1992, and has spread throughout Connecticut. Adults are 1/4–3/8 inch long, bright scarlet-red in color, with black legs, head, and antennae. Larvae are orange, brown, or yellow. They resemble a fragment of soil as they transport their excrement on their backs. Both adults and larvae feed on *Fritillaria*, *Lilium*, *Polygonatum*, and *Nicotiana*. Insect growth regulators may be effective in killing the early instar larvae but must be applied before the larvae start covering themselves with their excrement.

University of Rhode Island (URI) Biological Control Laboratory is researching natural enemies of the lily leaf beetle. Small parasitoids have been released throughout CT and URI researchers anticipate that these beneficial insects will disperse naturally from the release sites.

Biology and Life Cycle

- Overwintering adult beetles emerge from the soil in early spring.
- Females lay up to 250 eggs (over two growing seasons) on the underside of lily leaves.
- Larvae, which feed for approximately two weeks before entering the soil to pupate, cause most of the damage to plants.
- Adults emerge from pupae in 3–4 weeks and feed on plants until fall.
- Adults overwinter in soil and plant debris.



Figures 1 & 2: Lily leaf beetle adult (left) and larvae (right). Photos by L. Pundt

Tortoise Beetles

Golden tortoise beetles adults (*Metriona bicolor*) are shiny, golden beetles, less than $\frac{1}{4}$ " long, with thin margins that extend out from their body and a shield-like structure covering their head. They are sometimes mistaken for ladybird beetles and are called "gold bugs". Both adults and larvae can feed upon plants in the morning glory family (*Convolvulaceae*) (*Ipomoea sp.*) causing distinct round circular holes. Apply contact insecticides labeled for leaf feeding beetles in production where the damage may be unsightly to your customers.



Figures 3 & 4: Golden Tortoise Beetle adult (left) and their feeding damage (right)
Photos by L. Pundt

Biology and Life Cycle

- Tortoise beetles overwinter as adults.
- There is one generation a year.
- During late spring and early summer, adults lay their eggs on leaves.
- Eggs hatch into yellowish to oval brown, broad, spiny flattened larvae that use their rear spines to hold debris and excrement over their back.

Scarab beetles

Scarab beetles are large brightly colored beetles with lamellated tips on their antennae. **Asiatic garden beetles, Oriental beetles** and **Japanese beetles** feed on herbaceous perennials, annuals, woody ornamentals, and vegetables. Their fleshy legless larvae, ‘white grubs’ develop on the roots of many different plants. The identification of the particular grub species is important because the effectiveness of chemical and biological controls varies according to species. Identify species by the pattern of hairs (rasters) on the tip of the rear end of the grubs.

Asiatic garden beetle adults (*Maladera castanea*) are about 3/8 inch long and cinnamon-brown in color. Asiatic garden beetles feed at night on *Aquilegia*, *Aster*, *basil*, *Chrysanthemum*, *Dahlia*, *Delphinium*, *Helianthus*, *Heuchera*, *Phlox*, *Physostegia*, *Rosa*, *Rudbeckia*, *Salvia* and *Zinnia*. Their nighttime feeding causes c-shaped notches on the edges of leaves. During the day, adults burrow into mulch or soil or under pots. Immature white grubs feed on the roots of grasses and flowering plants. Asiatic garden beetles overwinter as grubs in the soil and adults emerge the following summer (mid-July to mid-August). There is one generation a year. Apply contact insecticides against adults; however, repeat applications may be needed. Manage grubs in grassy areas.



Figure 5 & 6 Adult Asiatic Garden Beetles (left) and their feeding damage (right).
Photos by L. Pundt

Adult Japanese beetles (*Popillia japonica*) are from 1/3 to 1/2 “ long, metallic green with copper-colored wing covers and white patches of hair near the end of the abdomen. Adults can feed during the day on many different woody and ornamental herbaceous plants. Adults emerge from the soil in June and July and feed for about 30-45 days. Eggs are laid in the soil in grassy areas and hatch into white, c-shaped grubs that feed on turf grass roots. Japanese beetles overwinter as grubs in the soil below the frost line. There is one generation per year.

Japanese beetles are extremely mobile, and once feeding begins, the pests emit feeding or aggregation pheromones attracting other beetles to the same location. Look for feeding between the leaf veins (“skeletonization”) on favored hosts.



Figure 7 & 8: Feeding damage from adult Japanese beetles. Photos by L. Pundt

Contact insecticides can be applied as soon as the adult beetles are observed. However, many of the contact insecticides may be harmful to bees, predatory mites and insects. Apply grub control to larvae in grassy areas surrounding production areas.

Biological and Cultural Controls

Good weed control in and around production areas helps to eliminate potential food sources. Use shade cloth to exclude adults from hoop houses. Japanese beetle traps are not recommended. Although they attract adult beetles, they only increase feeding damage on nearby plant hosts.

The female winsome fly (*Istocheta aldrichi*) is a natural parasitoid of adult Japanese beetles. Look for distinct white eggs on the thorax of adult beetles. The spring Tiphia (*Tiphia vernalis*) and summer Tiphia (*Tiphia popillivora*) are parasitoids that attack Japanese beetle and Oriental beetle grubs. Surveys in

Connecticut found that spring and summer *Tiphia* parasitoids are widely distributed. Surveys in Massachusetts and New Hampshire found these parasitoids in several counties as well.

Oriental beetle adults (*Anomala orientalis*) are about 1/2 “long, straw-colored or dark-brown with dark markings on their wing covers. Adults emerge from the soil in mid-June and are present until August. Adult beetles do very little foliage feeding. The white grubs feed on the roots herbaceous perennials, and woody ornamentals.



Figure 9: Oriental beetle adult. Photo by L. Pundt

Beneficial nematodes (*Heterorhabditis* sp.) are commercially available for use against white grub larvae. Scarab beetle species vary in their susceptibility to infection and white grubs have some defenses against nematode infection.

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