Non-Pests (Beneficials) of the Month: Predatory Ladybird Beetles

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In a previous issue I briefly covered the group of beneficials called predatory mites. Continuing on with coverage of some of the major beneficial insect and mites used in biological control programs, this article will deal with some other predators used in greenhouse and nursery biological control programs: the predatory ladybird beetles (not a musical group). There are a number of these predators available from commercial suppliers. All are considered general predators but are most effective in controlling certain pest groups. All of the ladybird beetles described are predators as adults and larvae. The following is a brief description of some of the most common and widely available predatory ladybird beetles used for biological control in greenhouses and interior plantscapes. Commercial biological control suppliers sell all of the predators listed. For more detailed descriptions and suggested use rates consult the references listed at the end of this article.

1. Convergent Ladybird Beetles (*Hippodamia convergens*)

Convergent Ladybird beetles probably are the most widely recognized beneficial insects. Although they feed on a large number of insects, they are most often associated with aphids. The adults (Figure 1) of the most common species are red/orange with black spots. Larvae (Figure 2), which are less recognized, are orange and black with a menacing appearance resembling tiny alligators. Adult females lay clusters of eggs on leaves of infested plants. Following egg hatch, larvae develop to adults in about one month. During this time each larva can eat up to 400 aphids. Adults live for a relatively long time - about 11 months. I don't know who counts these things, but each adult is said to eat as many as 5000 aphids during this time.

Buying and releasing these ladybird beetles can be risky, because they might fly away within a day or two. However, if a few remain in the release area and become established control can be very good. Repeat introductions are usually made. Be sure to follow release instructions that accompany the beetles. During warm weather months natural invasions of local ladybird beetles often occur if no pesticides harmful to the beetles are used. These invasions usually take place too late for effective biological control on commercial crops, but control is acceptable on most outdoor landscape plants.

2. Asian Ladybird Beetle (*Harmonia axyridis*)

Although an effective aphid predator this ladybird beetle (Figure 3) is not considered beneficial by many people because adults sometimes invade homes in large numbers to overwinter. Adults range in color and numbers of spots on the wing covers, but are often yellow-orange with black spots. It is often called the "halloween ladybird beetle". The beetle is an introduced insect in North America, and has become very successful outdoors. Most of the ladybird beetles I observed on outdoor roses near our campus were this species. Some scientists think that this species will crowd out and displace our native ladybird beetle (described above). Nevertheless Asian ladybird beetles are being sold by commercial suppliers

3. Mealybug Destroyer (*Cryptolaemus montrouzieri*) This ladybird beetle is especially effective when used for

control of citrus mealybugs. Much of their use is in interior plantscapes and conservatories. The adult (Figure 4) has a black abdomen with orange head and thorax. Eggs (200-700 per female) are laid in the cottony egg masses produced by citrus mealybugs. Adults live for about one month. Other mealybugs, such as the long-tailed mealybug, do not produce such "cotton", mealybug destroyers are not very effective for control. Larvae of mealybug destroyers (Figure 5) resemble large active mealybugs, and remind one of the story about the wolf in sheep's clothing.

Development is faster and more mealybugs are eaten at warmer (e.g. 80º F) than at 70º F. Most activity stops at temperatures below 60º F. Mealybug destroyers are more successful when mealybug numbers are high, and will not eliminate low populations. They are often used along with parasitoids to obtain more complete control.

4. Whitefly Destroyer (*Delphastus pusillus*)

This insect is among the smallest of the ladybird beetle predators. The black adults (Figure 6) are only 2-3 mm long. Despite their size they are very effective predators, and have been used successfully to help control both silverleaf and greenhouse whiteflies.

Eggs (about 75 per female) are laid on leaves near whitefly eggs. Adult female beetles need to eat at least 100 to 150 whitefly eggs per day to maintain egg laying. Larvae hatching from eggs also eat large numbers of whitefly eggs and small nymphs.

Delphastus beetles are most effective when whitefly numbers are too high for parasitoids alone (e.g. Encarsia or Eretmocerous) to do the job of control. The beetles will not feed on whitefly nymphs that have been parasitized, so they can be easily integrated with parasitoids.

References

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Figure 1. Adult convergent ladybird beetle (From Koppert web site).

Figure 2. Larva of convergent ladybird beetle (orange and black insect in center) on chrysanthemum.

Figure 3. Adult Asian ladybird beetle (From Koppert web site).

Figure 4. Adult mealybug destroyer (From Koppert web site)

Figure 5. Mealybug destroyer larva (center, with long hairs) among citrus mealybugs.

Figure 6. Adult whitefly destroyer on underside of leaf.