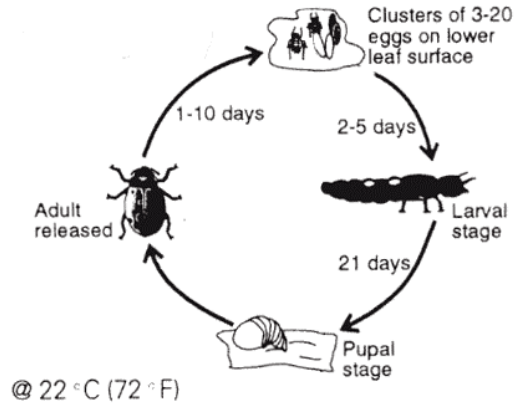


**Lady beetles *Coccinella septempunctata*,
Hippodamia convergens,
Harmonia axyridis,
*Coleomegilla maculata***



Target Pests Aphids; also mites, scales, mealybugs, and other slow moving insects.

Description

Lady beetles are general predators that feed on a variety of slow moving insects, but they are best known for feeding on aphids.

- Adults are shiny, hemispherical beetles, often reddish orange or yellow, with black markings.
- Larvae are black, with conspicuous legs and orange spots on their backs. They move from plant to plant on leaves.
- Eggs are yellowish-orange ovals, laid on end, in clusters of 3-20 on the underside of leaves.

Use in Biological Control

- Both larvae and adult lady beetles feed on aphids (for information on aphids, see Sheet 340); they will also feed on other biological control agents and, if food supplies are short, they will cannibalize each other.
- Optimum conditions are moderate temperatures of 16-28 °C (61-82 °F). They won't fly at temperatures below 13 °C (55 °F).
- Lady beetles enter diapause under short-day light conditions (<16 hours) and low temperatures (<13 °C (55 °F)).

Life Cycle

When released, adult lady beetles should mate and lay eggs within 8-10 days.

- Female beetles lay 2-3 eggs per day for an average of 700 eggs over their 100-day lifetime.
- Larvae consume up to 400 aphids each, at a rate of 50-60 aphids per day for later stages. Larvae feed for 3 weeks, then pupate on plant stems and twigs.
- After 2-5 days, adults emerge and continue to feed. Over its entire life, one lady beetle can consume up to 5,000 aphids.

Product Information

Depending on the species, lady beetles are either field collected and stored until release (e.g., *Hippodamia*), or they are reared in an insectary (e.g., *Harmonia*, *Coleomegilla*, *Coccinella*). When released, field collected beetles tend to disperse through vents or collect around windows and die. Field collected beetles may also be parasitized, which can reduce their effectiveness. Insectary reared adult beetles, however, lack parasites, are pre-mated and have a greater tendency to remain and become established in a

greenhouse or enclosed area.

Field collected lady beetles are sold as adults, usually packaged with straw or other carriers in the containers. Common container sizes are ½ gallon (35,000 beetles per container) and one gallon (70,000 per container). Note that some beetles in each container usually die over the hibernation and storage period.

Insectary reared lady beetles are sold in small containers of 100-500 larvae or adult beetles; mortality in these containers should be low.

If necessary, lady beetles can be stored for 1-3 weeks at 10-16 °C (50-61 °F). Once the lady beetles warm up they become active immediately. If it is necessary to cold store field collected beetles, bring them out to room temperature for 2 hours, twice a week, and sprinkle water on the bags to allow the beetles to drink.

Introduction Rates

Apply the lady beetles to the infested crop as soon after receipt as possible. In commercial greenhouses, release lady beetles in the infested areas of the greenhouse. Lady beetles will not survive in the absence of prey, therefore should be released after target pests (aphids, scale, whiteflies) are detected.

General introduction rates:

- Insectary reared beetles: Once the target pest has been detected, release at rates of 10-adults/infested plant, weekly, until established.
- Field collected beetles: 1.25 to 2.5 gallons/hectare (44,000-175,000 beetles/ha) or 0.5 to 1.0 gallons/acre (35,000-70,000 lady beetles/acre) two to three times, a few weeks apart.

For Best Results

- Lady beetles collected outdoors from hibernation sites have a strong instinct to disperse; they do not need to eat immediately because they have stored fat reserves. To encourage feeding, release them at night in enclosed areas to reduce the chance they will simply fly through vents or collect on side walls.
- Sprinkle the walkways near infested plants with water to provide liquid for the lady beetles.

Using Pesticides

For effects of specific pesticides on lady beetles, see Sheet 180.

Broad spectrum and systemic insecticides are toxic to lady beetles.

Spreader-stickers and wetting agents may harm them, but will not have residual effects.

Insecticidal soap, pirimicarb (Pirless®), pymetrozine (Endeavor®) and kinoprene (Enstar®) may be used in aphid 'hot spots' but reducing aphid numbers with pesticides also reduces the lady beetle food supply and reproductive ability.