

Lady Beetles¹

Lady beetles are the most widely known of the kinds of insects that feed on other insects and/or mites (i.e., natural enemies, biological controls). Some 80 species of lady beetles are present in Colorado and hundreds across North America. To date, eight of these have been confirmed present in Colorado hemp fields.

Lady beetles – like all beetles – have a development known as complete metamorphosis. This involves four life stages: egg, larva, pupa, and adult. All of these can be easily found on hemp.



Figure 1. Adult (upper left) and larva (lower right) of the convergent lady beetle



Figures 2. Lady beetle egg mass (top) and larvae at egg hatch (bottom)

Lady beetles lay eggs, on the leaves and buds of hemp, which are in the form of a small mass. The eggs are usually yellow or orange-yellow, somewhat spindle-shaped, and each egg mass may contain from as few as 5 to over 50 eggs. Adult beetles will lay most all eggs on plants that provide abundant insect prey to support the young; cannabis aphid is a particularly important kind of prey for the lady beetles on hemp. The eggs will hatch in about a week after they are laid, but is dependent on temperature.

The larvae that emerge from the egg are very small, about the size of the egg. They are generally dark gray and have legs that prominently stick out along the side of the body. Within hours after hatching, the larva begins to wander in search of prey. Over the course of the next 2-4 weeks (dependent on temperature) the developing larva grows in a series of stages, shedding its old “skin” in a process known as molting. As the larvae develop, they increase in size and most will develop spotting or other colored markings.

The larval stage is entirely predatory and is the most important stage for controlling insect pests on the crop and each will consume hundreds of insects in the course of their development. The lady beetles found in hemp are generalist predators, which may feed on a wide variety of small, soft-bodied insects. Aphids are the primary food used by lady beetles and high numbers of these insects will only be found when high populations of cannabis aphid are present. However, lady beetle larvae may feed on other small insects such as leafhoppers, young Lygus bugs, small caterpillars and insect eggs.

When the larva has consumed as much food as needed, it will begin the transformation to the next stage, the pupa. First they will settle somewhere on the plant, a leaf or stem, and attach to it at the end of their body. During the next day they remain in place, and their body shortens and thickens a bit. This is known as the “prepupa”. Later the old skin of the larva is shed, revealing the pupa.

The pupal stage remains attached to the plant and is somewhat more rounded in form. The pupa is pale colored when first produced but within a day darkens and is colored orange or orange-red, with some black markings. Depending on temperature, this stage will last about 10-14 days and ultimately the adult form of the insect emerges.

The adult is very pale and soft upon emergence from the pupa, but will darken and harden over the next several hours. When it is able to fly, it will usually leave the plant. The old “skin” of the pupa remains behind.

Lady beetle adults feed on insects, but not as many as their younger stage larvae. Adult lady beetles will also feed on supplemental foods such as honeydew (sweet waste excreted by aphids) or pollen. The adults are long-lived, at least a couple of months, and those produced late in the season seek shelter where they will survive through winter. The adult stage is the only form that survives outdoors through Colorado winters, and remains in a semi-dormant condition (diapause) until reemerging from their overwintering sites in late May and moving to plants to begin the cycle anew.



Figures 3. Top. Young larvae of convergent lady beetle feeding on cannabis aphid **Middle.** Convergent lady beetle larva, later stage **Below.** Mature larva of multicolored Asian lady beetle



Figures 4. Top. Prepupae (left) and pupae of convergent lady beetle. **Below.** Pupa of multicolored Asian lady beetle

The most common species of lady beetle found in Colorado hemp fields is **convergent lady beetle** (*Hippodamia convergens*). This is a native species to North America and can almost always be found readily in almost any hemp field after short inspection. Convergent lady beetle is also, incidentally, the commercially available species sold by biological control suppliers and, often, at retail nurseries. The beetles that are sold are all field collected from areas in the Sierra Nevada Mountains of California, where they move to find sheltered sites to survive through for their dormant period. Similar, smaller aggregations of dormant convergent lady beetles are present in some higher elevation sites along the Front Range, resulting from lady beetles that develop during spring and summer in eastern Colorado.

When cannabis aphid populations are high, two other lady beetles are fairly commonly seen, **multicolored Asian lady beetle** (*Harmonia axyridis*) and **sevenspotted lady beetle** (*Coccinella septempunctata*). Neither of these are native to

North America but both have become widely distributed over the past 50 years and now are among the most common species found throughout the Continent.

Several other lady beetles are present infrequently in Colorado hemp fields including the **parenthesis lady beetle** (*Hippodamia parenthesis*), **transverse lady beetle** (*Coccinella transversoguttata*), **ash-gray lady beetle** (*Olla v-nigrum*), **ninespotted lady beetle** (*Coccinella novemnotata*), and **pinkspotted lady beetle** (*Coleomegilla maculata*). Other species are present elsewhere; e.g., the **14-spotted lady beetle** (*Propylea quatuordecimpunctata*) may be found in hemp where this insect is present, in the upper Midwest and northeastern states.



Figure 5. Mating pair of convergent lady beetle, the most common lady beetle species found in Colorado hemp

¹ Coleoptera: Coccinellidae



Figure 6. Two common species of lady beetles in fields where cannabis aphid is present. **Top.** Multicolored Asian lady beetle. **Bottom.** Sevenspotted lady beetle



Figure 7. Some of the less common lady beetles found in hemp fields in Colorado. **Top to bottom:** Parenthesis lady beetle, transverse lady beetle, ash-gray lady beetle, ninespotted lady beetle