

SOME COMMON PREDATORS AND PARASITES OF INSECT PESTS ON ALFALFA

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Parasites

Parasites of the alfalfa weevil and Egyptian alfalfa weevil

Bathyplectes curculionis. This introduced wasp parasitizes alfalfa weevil and Egyptian alfalfa weevil throughout California, but only a small percentage of Egyptian alfalfa weevils are parasitized. The distinctive brown egg-shaped pupae has a white stripe around the middle and is found within the white cocoon of the parasitized weevil. Another species *B. anurus*, has very limited establishment.



Microtonus aethiopoulos. This introduced parasite attacks adult female weevils, drastically reducing oviposition. The parasite has been established in Glenn County and is common there in bur clover fields.

Tetrastichus insertus. This larval parasite of the Egyptian alfalfa weevil is established in many areas of the San Joaquin Valley. It attacks older larvae. Parasitized weevil larvae spin their cocoons, but do not pupate. The wasp pupates within the empty skin of the dead weevil larvae. Generally, it occurs too late in the season to have much economic benefit on weevil populations.

Parasites of aphids in alfalfa

Aphidius ervi. parasite of blue alfalfa aphid and pea aphid. Parasitized aphids turn into crusty bronze mummies. A round exit hole on the top indicates the parasite adult has emerged. This parasite controls these two aphids in most fields in most years—especially the blue alfalfa aphid. A related parasite, *A. smithi*, which prefers pea aphid, has been displaced by this species.



Trioxys complanatus, parasite of the spotted alfalfa aphid. This tiny wasp is a very effective parasite. Turns aphids into crusty bronze mummies.

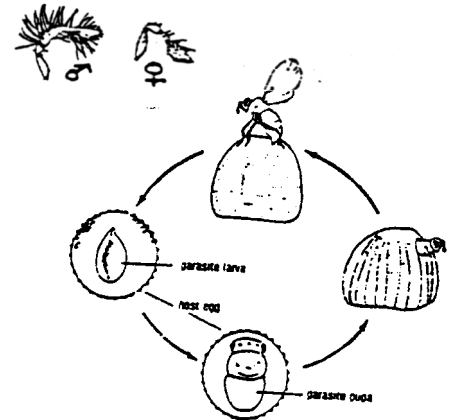
Parasites of alfalfa caterpillar

Cortesia medicaginis. This wasp attacks larvae, causing them to stop feeding before they can seriously damage the crop. Up to 100% of small alfalfa caterpillars may be parasitized. Pull apart caterpillars and the shiny white parasite larva will pop out. The fluffy white *Cortesia* cocoon can be found resting on leaves.



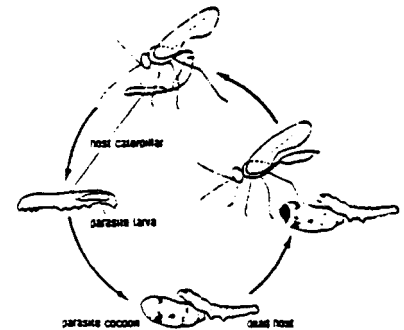
The fluffy *Cortesia* cocoon is sometimes found resting on leaves.

Trichogramma semifumatum. These naturally occurring tiny wasps attack eggs alfalfa caterpillars particularly in southern California. Look for eggs that have turned purple. Other species are available commercially but releases are not generally recommended in alfalfa. Life cycle is shown at left.



Parasites of armyworms

Hyposoter exiguae. This wasp parasitizes the larva of armyworms, corn earworms and loopers. After maturing, the parasite emerges to spin its fluffy, gray dotted cocoon attached to the skin of the dead caterpillar. Look for signs of parasitization when monitoring caterpillars. Life cycle shown at left



Tachinid flies. Almost all the many species of Tachinid flies are parasitic, and they are very important in biological control. Most species attack only one or a few host species, however, as a group they may parasitize Lepidoptera, Coleoptera, Hemiptera, Orthoptera or Hymenoptera hosts. Sometimes their newly laid eggs can be seen deposited on the host surface. Drawing at left is *Paradexodes* sp.



Hemipteran Predators

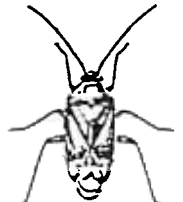
Orius tristicolor, minute pirate bug. These tiny predators are black and white as adults and an inconspicuous yellow-brown as nymphs. They are common predators in vegetable, field crop and garden situations and are often among the first predators to appear in the spring. They feed on mites, insect and mite eggs, and any tiny insect—especially thrips—in both adult and nymph stages. A related, less common species is *Orius insidiosus*.



Geocoris sp., big-eyed bugs. These small predators are especially prevalent in field and vegetable crops, strawberries, alfalfa and clovers. They feed on mites, lygus bug nymphs, aphids, small caterpillars, eggs, and other small insects. Their characteristic oversized eyes are present on both nymphs and adults and easily distinguish them from lygus bugs with which they are often confused.



big-eyed bug



lygus bug

Nabis americanoferus, the common damsel bug. These widely distributed predators feed on many mite and insect pests in most vegetable and field crops, but rarely inhabit trees. Nymphs resemble adults except they lack wings. Damsel bugs often appear in the field later than other predators and are more common later in the summer.



Zelus renardii, leafhopper assassin bug; *Sinea diadema*, the spined assassin bug. Assassin bugs have long, often spiny bodies and long legs and antennae. They are found in almost any crop or landscape situation and prey on many insect species including caterpillars, lygus bugs, aphids and beneficial species as well. Eggs are barrelshaped and laid in groups.

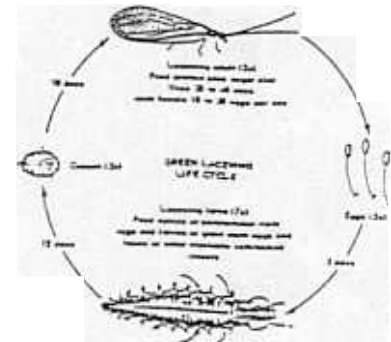


Emesa sp., thread-legged bugs. Adults are very slender and long legged, usually brownish and resemble small walking sticks. A general predator, related to assassin bugs preying on many insects and spiders.



Lacewings

Chrysoperla carnea; *C. rufilabris*; *Chrysopa nigricornis*, green lacewings. Numerous green lacewing species occur in California. The two species of *Chrysoperla* are commercially available. *C. carnea* is suitable for low growing plants; *C. rufilabris* can be used in trees or fields. These species are predaceous as larvae; adults feed on nectar. *Chrysopa nigricornis*, which is very common in alfalfa is predaceous in both adult and larval stages. Look for their eggs laid on long stalks, particularly where there is abundant honeydew. Feed on all types of insects, including aphids and caterpillars, and insect eggs.



Brown lacewings, *Hemerobius* spp., are similar to green lacewings in feeding habits, with both adults and larval stage predators, but are not as common as green lacewings in alfalfa. Adults are slightly smaller than green lacewings, and larvae resemble green lacewings; eggs are not laid on stalks.

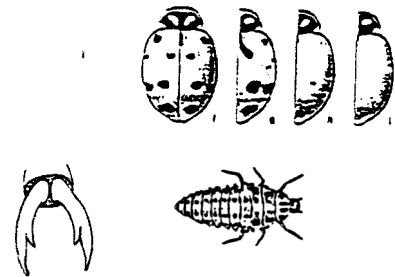
Predaceous Beetles

Coccinellidae

The coccinellids or lady beetles are the most well known group of predatory beetles. It is a large group; over 400 species of lady beetles are known in North America; all but two—the Mexican bean beetle, *Epilachna varivestris* and the squash beetle, *Epilachna borealis*—are predaceous, and neither of these two herbaceous species occurs in California. Lady beetles are easily distinguished from other beetles by their convex shape and flattened bottom; oval to round body shape; short, more or less clubbed antennae; and tarsi that look 3 segmented, but are 4 segmented. Most lady beetles have more specific food habits than general predators. The species of ladybeetles common in alfalfa are very important in the control of aphids.

Hippodamia convergens, the convergent ladybeetle. This red and black ladybeetle is probably the most well known predator of all. The converging white spots on its pronotum are generally diagnostic; don't count the spots—they may range in number from zero to twelve. The alligator-shaped larva is black with orange spots. Its yellow eggs are laid on end in groups. When aphid populations drop in the valley in summer, much of the convergent ladybeetle population migrates to the mountains to overwinter. Several other species of *Hippodamia* also occur in California; all feed primarily on aphids.

Hippodamia convergens,



cleft tarsal claw

Several other species of *Hippodamia* also occur in California; all feed primarily on aphids. These include *H. parenthesis*, *H. sinuata* and *H. quinquesignata ambigua*. The *Hippodamia* beetles all have femur visible from above, cleft tarsal claws and a more distinct pronotum than many other coccinellids.



Hippodamia sinuata



Hippodamia parenthesis.

Coccinella novemnotata, the 9 spotted lady beetle. This is a bit of a misnomer because many individuals in California have no spots at all. The *Coccinella* species can be distinguished from *Hippodamia* species by their more rounded shape; also their legs are not visible when the beetles are viewed from above. Several species of *Coccinella* of importance in California; all have squarish marks on their pronotum; all feed primarily on aphids. The seven potted ladybeetle, *Coccinella septempunctata*, has recently become introduced into California and is becoming very common. Larvae are superficially similar to those of *Hippodamia*.



Harmonia axyridis, multi-colored Asian ladybeetle. This recently introduced ladybeetle is becoming common in some areas. It has two stripes on its pronotum and many spots.

Adalia bipunctata, the two spotted ladybeetle. A common aphid feeding ladybeetle in gardens and fields, especially in spring. Highly variable but red forms have a "m" where the pronotum meets the elytra. Black forms have 4 red spots on elytra.



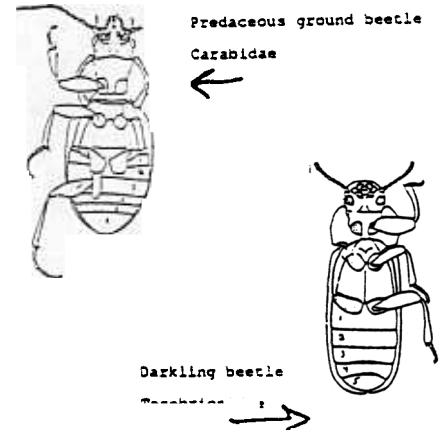
Olla abdominalis, ashy gray ladybeetle. One of the most important aphid feeders in orchards in California—but may also be found in alfalfa and other field crops. Two forms—an ashy gray one with black spots and a black form with two red spots. Larvae are black with yellow or orange markings.



Stethorus picipes, spidermite destroyer. A tiny black ladybeetle, quite common when phytophagous mite populations get high. Larvae are dull brown or black.

Other predatory beetles

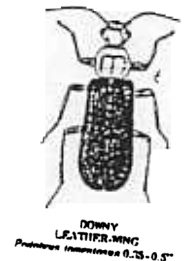
Carabid Beetles or Ground beetles. These soil dwelling beetles are believed to be important predators in both field and vegetable crops and tree crop situations. They feed on soil dwelling pupae and larva such as cutworms or wireworms. Usually black and shiny, flattened with a prominent thorax that is narrower than the abdomen, they have long legs and run rapidly. Their antennae are long and not clubbed like those of most plant-damaging darkling beetles, their mandibles are more prominent; their hind coxae are enlarged to extend below the first abdominal segment; and they have a large oval projection (trochanter) where their hind leg comes out of the abdomen.



Collops beetles. The collops beetles are a genus in the Melyridae or soft-winged flower beetle family. *Collops vittatus*, the two lined collops, preys on aphids, fleabeetles, caterpillars and pupae and other small insects in field and vegetable crops. The adult beetle is black with an orange pronotum and orange lines along the sides and center of the elytra. Larvae are pinkish orange and are soil dwellers.

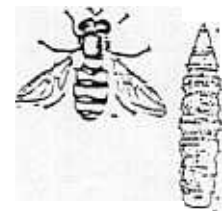


Cantharids or soldier beetles. These moderate to large sized beetles have leatherlike dark wings and orange or red heads and thorax. All species are predaceous as larvae and many as adults, feeding on aphids and other insects. Larvae are soil dwelling. The two most common genera in California are *Cantharis* and *Podabrus*.



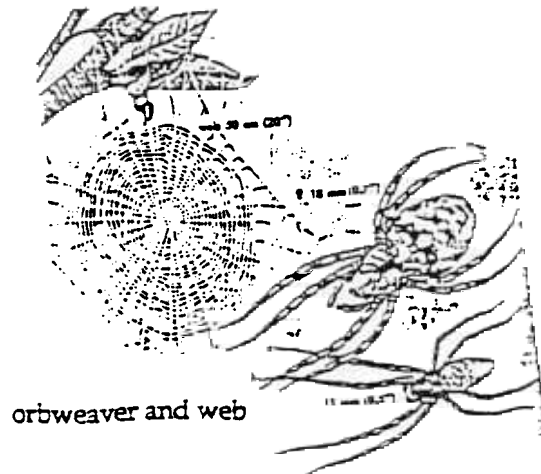
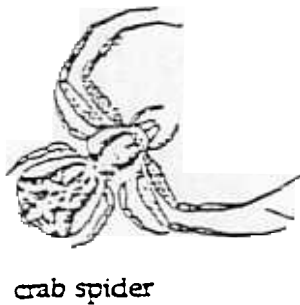
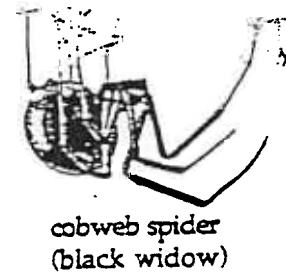
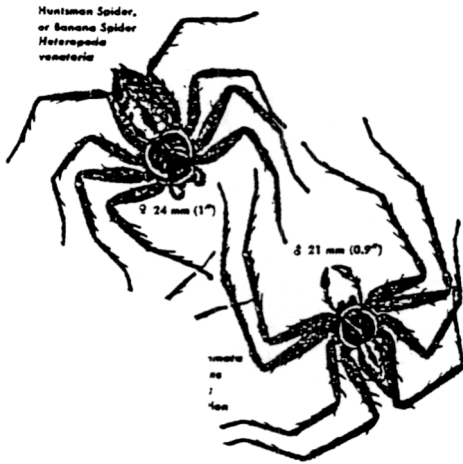
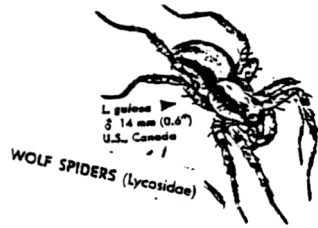
Syrphid Flies

Syrphid flies are important predators of aphids in all types of garden, field and tree crop situations. Adults, which superficially resemble wasps, feed on nectar and pollen before reproducing and are often seen hovering above flowers. Larvae are maggot-shaped, often found in aphid colonies. There are many species in California.



Spiders

Spiders are often abundant in gardens and farms and are believed to contribute significantly to biological control. Among the most common groups are the Therididae or cobweb spiders, usually found within their irregularly woven webs (these include the black widows); the orbweavers, which rest in or beside their symmetrical webs; and the crab spiders, which spin no webs at all.



For color pictures of pests and natural enemies in alfalfa see *Integrated Pest Management for Alfalfa*, University of California Division of Agriculture and Natural Resources Publication 3312 available at your UC Cooperative Extension office or call (800)994-8849.