

Hazelnut Pest and Beneficial Insects

An identification guide

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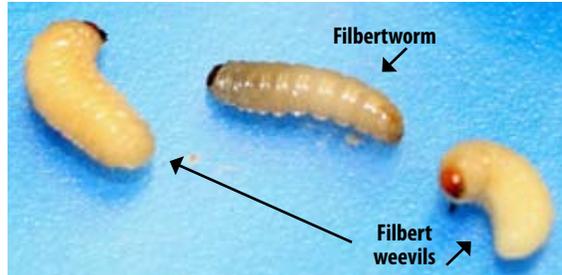
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Nut-feeding pests

FILBERTWORM



Filbertworm *Cydia latiferreana*
Adult



Filbertworm larva has visible legs, is pale, and has a worm shape. Filbert weevil larva is legless, a milky color, and has a grub shape.



Filbert weevil *Curculio occidentis*
Adult

Knowledge of this pest is limited, due to inconsistent damage and infestation patterns.

Life stages



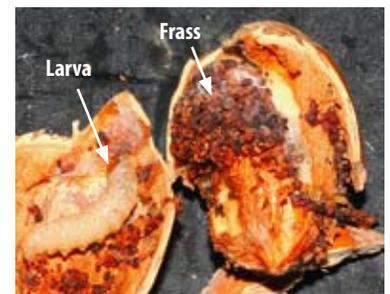
(left) Filbertworm larva in winter cocoon. Larvae overwinter in organic matter such as debris and grass.

(center) Adult filbertworm. Flights and damage occur as early as late May and as late as harvest in October. Possibly two generations per season. First trappings made in surrounding oaks.

(right) Filbertworm pupa.

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Symptoms



Trapping

- Pheromone traps for adults
- Four traps for first 10 acres, one trap for each additional 4 acres
- Place traps in upper third of canopy by mid-June
- Check traps once a week until you detect pest activity; increase checks to twice a week until you apply pest controls.
- Action thresholds—two to three moths per trap, or five moths in any one trap



Pherocon VI trap



Delta trap

Foliage-feeding pests

LEAFROLLERS

Sampling

Monitor weekly from late March to late May. Both species:

- Larvae—three terminals per tree, three leaf clusters per terminal
- Adult—one pheromone trap per 5 acres, placed 6 feet off the ground, up in tree
- Action threshold—for larvae, 20–25% infection; for adults, a combination or single-species catch of 40 moths per week, and larvae feeding on nuts



Obliquebanded leafroller (OBLR)
Choristoneura rosaceana
Adult (top) and larva



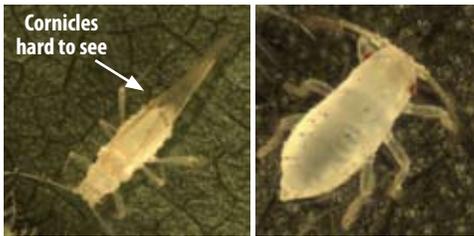
Filbert leafroller (FLR) *Archips rosana*
Adult (top) and larva

Symptoms

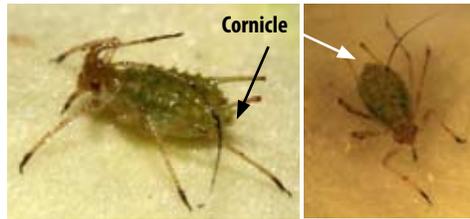
- Both species—rolling of leaves, starting late March to late May; feeding on new buds and leaves
- OBLR—scarring and staining on young nuts, due to larval feeding
- FLR—adults emerge from late June or July through mid-August; OBLR—adults emerge from early June through mid-July

APHIDS

High aphid populations may lead to excessive honeydew, then to possible loss of photosynthetic ability due to sooty mold on leaves, and thus to potential crop losses.



Filbert aphid *Myzocallis coryli*
Winged adult at left; immature form at right



Hazelnut aphid *Corylobium avellanae*



Hazelnut aphids on husk

Filbert aphid characteristics

- Cornicles are short and hard to see
- Smaller than hazelnut aphid
- Body pale green to yellow
- Antennae and legs are same color as body
- Found on leaves and husks

Hazelnut aphid characteristics

- Long cornicles visible
- Body larger and darker green than filbert aphid's; sometimes reddish orange
- Antennae and legs are darker than body
- Found mostly on husks
- Sometimes difficult to see

Beneficials

Trioxys pallidus and other beneficials can have a profound impact on aphid numbers. When sampling aphid populations, look for parasitism by counting the mummies on leaves. Exclude mummies when determining the number of aphids per leaf. If mummies are present, allow another week to determine whether biocontrol with *Trioxys* is reducing aphid pest populations below the threshold. Aphid mummies differ from healthy aphids in shape, size, and color; mummies are more round and often are bronze.



Filbert aphid mummy



Aphid parasitoid
Trioxys pallidus

Sampling

When leaves have fully developed, sample every second week. Ideally, sample three terminals per tree, looking at the newest fully expanded leaf on each terminal. Look at 20 evenly spaced trees per 2–4 acres of orchard.

Action thresholds—

- In April, 20 aphids/leaf
- In May, 30 aphids/leaf
- In June, 40 aphids/leaf
- In July, 40 aphids/leaf, and populations are increasing weekly

MITES

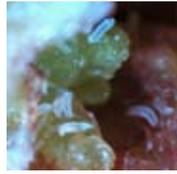
Symptoms

Big bud mite (early season)

- Examples: *Phytoptys avellanae*, *Cedidophyopsis vermiformis*
- Microscopic, cigar shape, milky color
- Two pair of legs, close to head
- Cool-weather pest; overwinters inside bud and causes damage during winter. Blasted buds in late winter and early spring.
- Monitor in spring. Use double-sided sticky tape and check for mite movement using a 20X hand lens.
- Treat early during budbreak and after movement is detected.



Blasted bud



Big bud mite
Phytoptys avellanae /
Cedidophyopsis
vermiformis
Adults

Spider mite (in season)

- Examples: Two-spotted spider mite, *Tetranychus urticae*; Willamette mite, *Eotetranychus willamettei*; Pacific mite, *Tetranychus pacificus*
- Summer pest: damage during summer; overwinters as adult, in leaf litter.
- Round
- Three to four pair of legs, depending on age; legs visible with hand lens.
- Found on leaves during season. Causes leaf stippling, chlorophyll death, and webbing on leaf surfaces. Leaf damage usually is not economically important.
- Monitor in summer
- Currently, no action thresholds. Look for predatory mite activity, which might naturally control pest mites.



Two-spotted spider mites and eggs (20X)



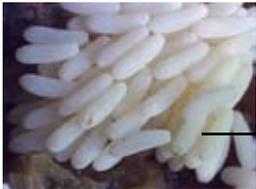
Leaf stippling symptoms on late-season leaves

Generalist natural enemies: life stages

Here and on the following page are the most common beneficials found on hazelnut. If they are in your orchards, a higher level of bio-control might be in force there. However, regular pesticide use may cause a decline in populations of beneficials. For more information on a wider range of beneficials, visit <http://extension.oregonstate.edu/catalog/pdf/ec/ec1613-e.pdf>

Syrphid flies (Hover flies) *Syrphus* spp.

- Adults mimic wasps and bees but fly more quickly and hover
- Adult abdomen often has markings
- Larvae are maggotlike and can prey on aphids and scale insects
- Adults are found near flowers



Syrphid fly eggs



Syrphid fly larva

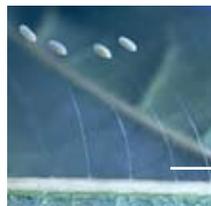


Syrphid fly pupa



Syrphid fly (hover fly) adult

Lacewings *Chrysopa* and *Hemerobius* spp.



Lacewing eggs are stalked



Lacewing larvae



Lacewing pupa



Green lacewing *Chrysopa* spp.
Adult

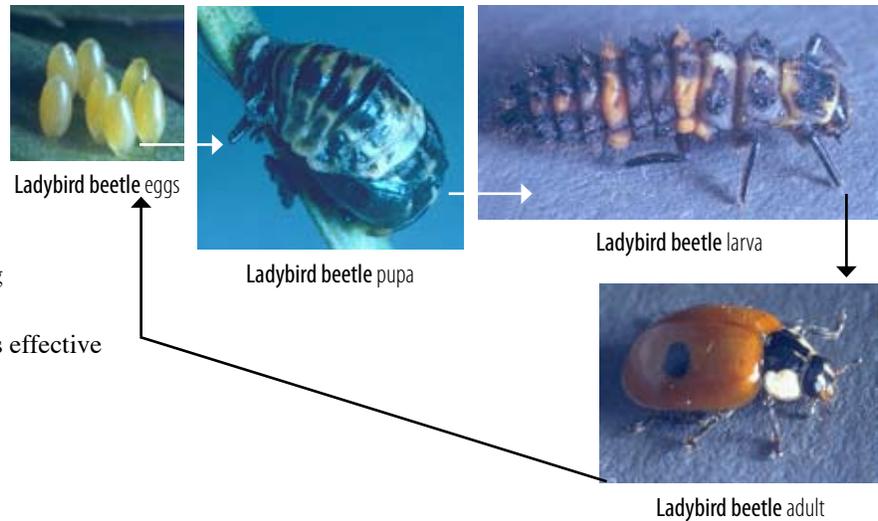


Brown lacewing
Hemerobius spp.
Adult

- Green lacewings are pale green with bright golden eyes.
- Brown lacewings are light brown.
- Adults are delicate and weak fliers, 12–20 mm long with long antennae.
- Adults often lay eggs on stalks, very near hosts.
- Lacewings can feed on aphids and scale insects in the orchard. One larva can consume 100–600 aphids during its development.
- Adults also need nectar (which may be excreted by aphid populations) and pollen.

Ladybird beetles *Adalia* sp.

- Adult usually is red or orange with black markings or, sometimes, black with red markings.
- Adults are strong fliers and robust.
- Adults overwinter and lay eggs in clusters in spring or early summer.
- Adults and larvae feed on aphids, mites, scale insects, and other small insects. They can consume several hundred aphids during their lifetimes.
- Very effective at high pest densities but less effective at low densities.



Other generalists

Several other generalists, such as ground beetles, have been found feeding on overwintering filbertworm and filbert weevil larvae. Earwigs and spiders also can feed on insect pests.



Earwig *Forficula auricularia*
Adult with eggs and larvae



Sheetweb spider *Pimosa altioculata*
Adult



Common ground beetle *Pterostichus scitulus*
Adult

Acknowledgments

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