



TREES & SHRUBS

Apple and Pear Insects

no. 5.519*by W.S. Cranshaw and R.J. Zimmerman¹*

Quick Facts...

Codling moth is the most serious insect pest of apples and pears. Thinning fruit, trapping the insects, and appropriately timing insecticide applications can control this insect in home orchards.

Many pests affecting apples and pears can be controlled with horticultural oil sprays applied to dormant trees in spring.

Codaphone messages can assist with timing of treatments for orchard pests in the fruit-growing areas of the Western Slope. Call (970) 244-1806.

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Reviewed 3/03.

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Several insect and mite pests attack apple and pear trees in home plantings. Some, such as codling moth, are serious problems in Colorado almost every year and require regular treatment. Others, such as mites and scales, cause more subtle injuries and should be monitored and treated when necessary.

Codling Moth

The immature (larval) stage of the codling moth (*Cydia pomonella*) is the worm in “wormy apples.” Codling moth also commonly damages pears and larger-fruited varieties of crabapples. Wherever these fruit trees are grown in Colorado, codling moth is a serious problem and usually will need some treatment to protect the fruit.



Figure 1: Codling moth larva in core.

Codling moth has two or three generations per year. Adult moths first emerge (first flight) during midspring, usually around the period of full bloom. This flight continues for about six or seven weeks, peaking a couple of weeks after the first moths become active.

First-flight moths lay eggs on the leaves. The larvae first feed on the leaves, later moving to the developing fruit. After feeding within the fruit, the full-grown larvae migrate out and crawl down the trunk of the tree to pupate under bark flaps or in other protected locations.

The second, and most important, generation occurs in early summer. Adults emerge in early July, laying eggs directly on the fruit. The young caterpillars tunnel into the fruit shortly after egg hatch. Most of the fruit damage occurs at this time. Again, when full grown, they leave the fruit to seek protected areas around the tree to complete their development.

Occasionally, when temperatures are above average, a small percentage of the population will continue to develop and produce a third generation. The others remain dormant until the following spring. This third generation causes little injury, except to late-maturing fruit.

Insecticides are a common technique used to control codling moth and should be applied shortly after petal fall. Many people continue these treatments at 10- to 14-day intervals throughout much of the summer. Permethrin and carbaryl (Sevin) are the most common homeowner treatments for codling moth. (Note: **Never apply insecticides during periods of bloom.** Treatments at this time will kill beneficial pollinators, such as honeybees.)



Figure 2: Frass from codling moth on apple.

Insecticides can be limited and treatments better timed by using pheromone traps. These specialized traps are baited with the sex attractant of the female codling moth. The traps capture male moths and give an estimation of when mating and egg-laying take place. The first insecticide application is often optimal about three weeks after the first consistent captures of male moths. The traps also can give some estimation of how many insects are present. It has been suggested that for backyard orchards, there is little benefit from treatment if trap captures are less than five per week. In some of the Western Slope fruit-producing counties, codling moth and other fruit insects are routinely monitored. Information on their activity is made available through codaphone messages and other media by Colorado State University Cooperative Extension county offices and regional Experiment Stations.

Several nonchemical approaches also help control codling moth. Thinning apple fruit can limit codling moth infestations, because many of the caterpillars successfully enter fruit through points where fruits are in contact with each other. Thinning also helps provide better control of codling moth when sprays are used. Pick up and dispose of any apples that show evidence of codling moth entry wounds. Early entries (“stings”) appear as a reddish circle on fruit, while more advanced infestations show brown frass that the caterpillars excrete at the wound opening.

A burlap or corrugated cardboard band around the trunk can cause many larvae to settle and pupate at these sites, where they can be regularly collected and destroyed. Some control of adult codling moths is possible using homemade traps containing water and molasses mixtures, typically in about a 10:1 ratio. These water-molasses traps capture both sexes. Pheromone traps that collect only males cannot control codling moth.



Figure 3: Pear psylla nymph in honeydew.

Pear Psylla

Pear psylla (*Cacopsylla pyricola*) are a serious pest of pears grown along the Western Slope. These aphid-like insects suck the sap from the leaves and produce large, sticky drops of honeydew that can coat the tree and fruit. Heavy infestations also greatly weaken pear trees.

Pear psylla spend the winter near previously infested pear trees. They return in early spring, typically around late March in the Grand Junction area. Once on the trees, they begin to feed and lay eggs, producing several generations throughout the growing season.

Pear psylla are highly resistant to most available insecticides. Oil sprays, sometimes combined with an insecticide, can be effective when applied during the dormant season shortly after the pear psylla adults return to the trees. Sulfur-based sprays also can be effective but should never be applied with oils; plant injury may result. Cooperative Extension codaphone messages in the Western Slope fruit-growing areas can aid accurate timing of pear psylla treatments.

Pear psylla problems are greatly lessened in unsprayed orchards, where they are heavily attacked by parasites.



Figure 4: Apple maggot injury to apple.

Apple Maggot

Eastern strains of the apple maggot (*Rhagoletis pomonella*) have become established in certain areas around Colorado Springs and Denver. Apple maggot is a potentially serious pest of apple as the maggots (larvae) tunnel the fruit, creating characteristic dark tracks. Infested fruits also are prone to spoilage. There are naturally occurring populations of apple maggot on the Western Slope. However, these strains restrict their feeding to wild hosts such as hawthorn and have never been observed to infest apples.

Common Disorders of Apple

Twig or branch die-back, leaves suddenly wilted but not fallen:

Fire blight

White woolly material on branches, trunk:

Woolly apple aphid

Decline in tree vigor, trunk tunnelled:

Flatheaded apple tree borer/

Pacific flathead borer

Decline in tree vigor, decay in root and crown areas:

Phytophthora root and crown rot

Decline in tree vigor, branches covered with small, circular scales:

San Jose scale

White speckling or streaking of leaves:

White apple leafhopper,

tentiform leafminer

Leaves covered with white powder:

Powdery mildew

Leaves bronze-colored and perhaps dropped prematurely:

Twospotted spider mite, McDaniel spider mite

Leaves with brown, scabby patches:

Eriophyid mites, cedar-apple rust

Leaves chewed:

Eastern tent caterpillar, redhumped caterpillar

Leaves curled:

Rosy apple aphid, green apple aphid, leafrollers

Fruit tunneled:

Codling moth, apple maggot

Fruit deformed, often with old wounds present on surface:

Leafrollers, Oriental fruit moth, climbing cutworms (speckled green fruitworm), plant bugs, campyloomma bugs, hail injury

Light spotting of fruit:

San Jose scale, flower thrips

Dark spotting of fruit:

White apple leafhopper, hail injury

Fruit surface with general brown coloring (russeting):

Spray injury, powdery mildew

Apple maggots spend the winter in the pupal stage around the base of apple trees. The adult flies emerge in midsummer, typically between mid-July and early August, and lay eggs on the fruit. There is only one generation per year.

Apple maggot flies can be trapped with yellow sticky boards or red sticky spheres (super apples), the latter developed specifically for this insect. These traps are useful for timing sprays to control the insect, with sprays timed to coincide with periods when the flies are being captured. Furthermore, the use of several red sticky spheres per tree also can provide substantial control of this insect by killing adult females before they lay all their eggs.

Spider Mites

Spider mites can be serious pests of orchard plantings but are rare in home orchards. Outbreaks typically occur during hot summer weather, with mites producing scorch-like symptoms on infested leaves. Trees that are damaged by spider mites typically yield poorly and produce smaller fruit. Spider mite outbreaks usually are stimulated by applications of nonselective insecticides such as carbaryl (Sevin), which are destructive to their natural enemies.

The spider mites that attack apple and pear usually spend the winter in protected sites on the trees. Horticultural oils applied during the dormant season usually can provide adequate control of spider mites in home plantings.

There are relatively few options for control of spider mite outbreaks. Sprinklers irrigating the tree or washing it with a forceful stream of water from a hose for brief periods during the day can suppress outbreaks. Insecticidal soaps and horticulture oils are among the few effective chemical controls available to backyard growers.

Eriophyid Mites

Pears and apples sometimes can be infested by various species of eriophyid mites. These minute mites cause several disorders on the leaves and fruit. For example, the pear russet mite causes a dark thickening of the pear fruit skin. Blister mites produce small, scabby patches on the leaf surfaces of both apple and pear.

Eriophyid mites do not affect fruit production in backyard orchards, although the damage they produce sometimes attracts attention. Horticultural oils sprayed during the dormant season can kill overwintering eggs. Most orchard insecticides (including carbaryl) can control eriophyid mites.

Scale Insects

Scale insects occasionally damage apples and pears. Perhaps most damaging is the San Jose scale (*Quadraspidiotus perniciosus*), a tiny, circular scale found on fruit as well as branches. Heavy infestations can cause death of infested branches and spotting of infested fruit and can contribute to a general decline of the tree.

Scale infestations typically are slow to develop. Regular treatments are rarely needed in backyard orchards. Treatments with horticultural oils during dormant periods in spring can provide adequate control of these insects.

Aphids

Several species of aphids, most notably the green apple aphid (*Aphis pomi*) can damage the new growth of apple. Also, the rosy apple aphid (*Dysaphis plantigena*) may injure developing fruit, causing it to become mottled and misshapen.

Aphids on fruit trees spend the winter as eggs clustered near the buds. After eggs hatch in spring, the aphids feed on the emerging leaves, causing slight



Figure 5: Woolly apple aphid on stem.

Common Disorders of Pear

Leaves bronze-colored and perhaps dropped prematurely:

Twospotted spider mite, McDaniel spider mite

Leaves with brown, scabby patches:

Pearleaf blister mite

Upper surface of leaves chewed, leaving veins:

Pear slug

Leaves curled and chewed:

Leafrollers

Leaves yellow and dropped prematurely:

"Psylla shock" (pear psylla injury), iron chlorosis

Sticky material (honeydew) on leaves, fruit:

Pear psylla

Fruit tunneled:

Codling moth

Fruit deformed, old wounds limited to surface:

Leafrollers, Oriental fruit moth, climbing cutworms, plant bugs, campyloomma bugs, hail injury

Spotting of fruit:

San Jose scale, hail injury

Fruit surface with brown coloring:

Russet mite, sooty mold growing on pear psylla honeydew, damage from oil-based sprays

leaf curls. Horticultural oils applied in late winter or early spring (dormant season) can prevent these problems.

Diazinon, malathion and insecticidal soaps also can help suppress aphid outbreaks after leaves emerge. However, aphid infestations typically are short-lived on apples. Aphids usually leave the tree by late spring, flying to alternate summer host plants. If aphids are not seriously damaging the majority of terminals or injuring fruit, there is little benefit from insecticides for aphid problems after leaves emerge.

The woolly apple aphid (*Eriosoma lanigerum*) affects apples in a different manner than other aphids. This insect has long, thread-like strands of wax that cover its body. They infest twigs, callous tissues around pruning cuts, and sometimes roots of apple trees. Sustained infestations of woolly apple aphid over several years cause cankers to develop that can girdle and kill parts of the plant. Insecticidal soaps and carbaryl (Sevin) are effective against the woolly apple aphid where it occurs on stems. There are no effective treatments for woolly apple aphid on roots.

Pear Slug (Pear Sawfly)

The pear slug (*Caliroa cerasi*) is a rather unusual insect that feeds on the upper leaf surface of pears, sweet cherries and several related plants. The larvae are slug-like but actually are the immature stage of a type of nonstinging wasp (sawfly). Feeding damage by pear slug larvae is highly characteristic in that injury is confined to areas between the main veins on the upper leaf surface. This produces a lacy, skeletonized injury on infested leaves.

Pear slug larvae are easy to control with any home orchard insecticide, including insecticidal soaps. Larvae also may be washed off with a vigorous jet of water. A light dusting of the leaves with wood ashes is another highly effective control. See fact sheet 5.560, *Pear Slugs*.

White Apple Leafhopper

The white apple leafhopper (*Typhlocyba pomaria*) is a common insect on apples and related plants. They are small, pale-colored, elongated insects that are found on the undersides of the leaves, where they feed on sap. Injuries by these insects produce characteristic white flecking. Serious infestations are rare in backyard plantings but occur frequently in orchards where insecticides kill many of their natural enemies.

"Catfacing Insects"

Several insects distort apple fruit by their feeding. This condition is known as a "catfacing injury." Caterpillars of climbing cutworms, such as the speckled green fruitworm and the fruittree leafroller, may chew areas of young apples that later appear as dimpled scabs on the fruit surface. Sucking "true bugs" — such as stink bugs, lygus bugs, boxelder bugs and campyloomma bugs — sometimes damage developing fruit by killing small patches of surface tissue.

Problems with catfacing insects are of little concern to home orchardists, because the fruit remains in generally good condition despite the scarring. Occasionally, more severe problems occur when orchards are next to alfalfa fields. Alfalfa is a common host plant for catfacing insects such as the lygus bugs, which migrate in large numbers following harvest.



Figure 6: White apple leafhopper injury to foliage.

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