



Insect Control for Apples and Pears In the Home Garden

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Several pests of major importance affect apples and pears grown in the home garden. Unblemished, worm-free fruit cannot be produced without pest control and tree care. This publication should help you control the important insect and mite pests of apples and pears.

Major Insect Pests

Codling Moth

The codling moth is the worm commonly found in apples and the major pest of apples and pears. Unsprayed apple trees will have 50 to 85 percent wormy fruit during most years. Pears also become infested, but the damage is usually less severe. The insect overwinters as a larva under the bark of apple trees or in other protected places. The adults first emerge in May. Their emergence can be monitored with pheromone traps.

The moths are seldom seen in an orchard because they are active during twilight hours. As many as three generations may develop during a season, but the first generation is the most important. Most failures in codling moth control result from poor control of the first generation. With good control in early summer, the later generations will be greatly diminished unless you have unsprayed trees in your immediate vicinity. Imidan, diazinon, Sevin and *Bacillus thuringiensis* are the most effective insecticides for control of this pest. The first spray should be applied on apple trees May 25-30 in the Treasure Valley or in Lewiston. In other areas of Idaho, make the first application when the fruit is the size of a nickel.

Rosy Apple Aphid

The rosy apple aphid is potentially the most damaging aphid species on apples. The aphids cluster on the undersides of leaves of the fruit spurs where they can

cause distorted leaf and stem growth and severe leaf curling. Their direct feeding on the fruit causes misshapen and dwarfed fruits.

The rosy apple aphid overwinters in the egg stage, often hidden in cracks in tree bark or in bud axils. Newly hatched rosy apple aphids are found on very young growth in early spring. Young aphids are dark green, but turn a rosy brown when mature. This aphid is a springtime pest on apple trees, migrating to weed hosts by early summer. It returns to apple trees in fall to lay eggs on the terminal growth.

Apple Aphid

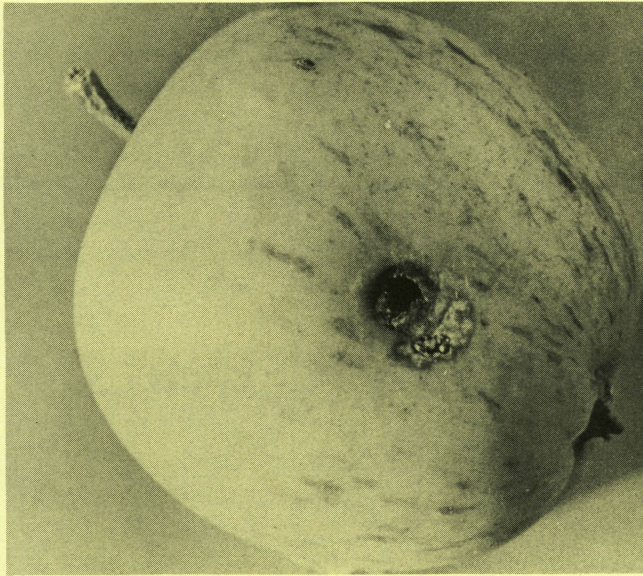
The apple aphid, often called the green apple aphid, also overwinters as an egg on the bark of apple trees. It hatches slightly later in spring than the rosy apple aphid and remains on apple trees throughout the growing season. This aphid's feeding causes retarded growth of new shoots. In heavy infestations, the apple aphid may cover foliage and fruit with large quantities of honeydew. A sooty black fungus will grow on the honeydew, turning the fruit black.

Oil sprays applied in early spring just before buds turn green — called dormant oil sprays — are an effective control of both aphid species. If you don't use a dormant spray, apply an insecticide for aphids just before the tree blooms (prepink) and again, if needed, immediately after the blossoms have fallen. DO NOT spray insecticides on blossoming trees because most insecticides will kill the bees necessary for pollination. Summer sprays may be required if aphids remain a problem.

San Jose Scale

San Jose scale is a serious pest of neglected and poorly managed fruit trees. Heavy infestations on apple and pear trees can kill entire limbs or cause spotting of the fruit. After attaching itself to the twig or fruit, the scale secretes a whitish-gray, waxy, protec-

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Codling moth damage.

tive covering, lives, feeds, and grows to the size of a pinhead.

Young crawlers are produced in early summer. The crawlers spread out rapidly to establish new feeding sites on fruit and new growth, where they settle. Crawlers also secrete their own waxy coverings as they mature. Lady beetles, lacewings, parasitic flies and wasps usually control scales in untreated trees.

The waxy scale covering protects this insect from insecticide sprays. Only a dormant oil spray is effective against this covering. Scale crawlers can be controlled with diazinon sprays after they emerge from eggs in late June or early July.

Pear Psylla

Pear psylla is a pest of pears only. Since it prefers cool weather and succulent foliage, populations build up in spring and early summer. However, injurious populations persist throughout the season if you don't control them early. Besides weakening the tree, this pest produces honeydew that causes a black, russet-like injury when it contacts the fruit. Sprays applied during the tree's dormant and "prepink" periods are the most effective. Summer sprays may be necessary during some years.

Pear Slug

The pear slug is a flattened, slug-shaped, slimy, black sawfly larva. Its presence is noticed in early summer when it skeletonizes pear leaves. It is controlled easily with a variety of pesticides.

Leafrollers

Several species of insects called leafrollers feed on foliage and roll the leaves of fruit trees. When

leafrollers attack early in the season, fruit is often cut off or fed upon, becoming strongly deformed. The apple-and-thorn skeletonizer is a serious pest of unsprayed trees in Idaho's Panhandle. Spray the foliage for leafrollers with diazinon, Sevin, Imidan or *Bacillus thuringiensis* when you first see damage, usually soon after your trees have finished blooming.

European Red Mite and Twospotted Spider Mite

The European red mite and twospotted spider mite feed on leaves and fruit. The mites puncture the leaf cells and remove the contents. The leaves first become mottled green, then turn bronze or black and often drop from the tree. The European red mite overwinters in the egg stage and can be killed with a dormant spray.

Mite control must include preventive measures such as keeping trees properly irrigated and fertilized. In many cases, mite populations can be reduced by washing trees with a garden hose every 2 or 3 days during hot weather. The natural enemies of spider mites are predatory mites, small lady beetles and predatory bugs. These predators are susceptible to many pesticides. The twospotted spider mite and summer generations of the European red mite should be treated with Kelthane when predators and preventive measures fail.

Pear Rust Mite, Apple Rust Mite and Pear Leaf Blister Mite

The pear rust mite, apple rust mite and pear leaf blister mite cause russetting and scarring of the fruit and cause leaves to turn pale green then brown between major veins. These mites are often suppressed by predators. A dormant spray of polysulfide is effective for overwintering generations. Diazinon may be used early in the season (prepink). Kelthane is effective in summer.

Caterpillars

Caterpillars such as redhumped caterpillars, tent caterpillars, climbing cutworms and other occasional pests should be treated only when you have damaging populations.

Biological Insecticide

Bacillus thuringiensis is a bacterial spore formulation sold as a biological insecticide. It is sold under various trade names such as B.t., Thuricide and Dipel. It is a specific spray that controls only the larvae of butterflies and moths such as codling moth, leafrollers, cutworms and caterpillars. The insect has to eat the spores before the product can be effective.

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Since the product is specific, it does not interfere with biological control by predatory and parasitic insects.

Ultraviolet light breaks down the formulation quickly, so you need to spray more times than you would with conventional pesticides. You should spray for apple worms (codling moth) during the last week of May in Lewiston or the Treasure Valley. Apply additional spray every 7 to 10 days until mid-August.

Pheromone Traps

A pheromone is a chemical substance produced by unmated female insects to attract males. Some of these chemicals have been made artificially and are available to help pinpoint the timing of insect activity. The traps have the attractant placed upon a sticky surface. Traps catch only male insects and are an indicator of future activity.

The males emerge before the females, mate, and a few days later females lay eggs that hatch in 3 to 5 days. Then, the larvae start feeding. There are usually 1 to 3 weeks between trap catches and fruit damage, depending upon temperature. The suggested timing for

insect sprays is after the eggs are laid and before the larvae hatch, usually about 1 week after catch. These traps are only an indication of male activity, and if you have many unsprayed trees in your neighborhood, the traps will catch moths the entire season. In this situation, the traps indicate that you need to protect your fruit all season.

Traps are available for codling moth, oriental fruit moth, pandemis moth and other leafrollers. Pheromone traps are available from Wilbur-Ellis Company, P.O. Box 988, Caldwell, ID 83606.

Organic Spray Programs

Apply dormant oil plus calcium polysulfide during the tree's dormant stage for aphids, scales and spider mites. If aphids develop, apply nicotine sulfate or insecticidal soap. Apply sprays of *Bacillus thuringiensis* for codling moths at 7- to 10-day intervals after the apples reach the size of a nickel. Use *Bacillus thuringiensis* for cutworms or leafrollers as needed. If spider mites develop, wash the trees with a garden hose daily for a week or apply insecticidal soap.

Spray guide: Home garden apples and pears in Idaho

Time of application	Target pest	Insecticide and amount per gallon of water	Days from application to harvest
Dormant (February-April)	Scales, aphid eggs, mite eggs	5 T Superior oil + 8 T calcium polysulfide or	0
		4 T Superior oil + 1 T diazinon 50 WP	14
	Pear psylla (pears only)	8 T Superior oil + 1 T diazinon 50 WP or	14
		1 T nicotine sulfate 40 EC	7
Prepink (Just before blossoms open)	Leafrollers, mites, aphids, pear psylla	3 T Imidan 12 WP	7
	Mites, aphids, leafrollers	2 tsp diazinon 50 WP or	14
		1 T diazinon 25 EC	14
	Aphids, rust mite, blister mites, pear psylla	2 T Thiodan 9 EC	30 apples, 7 pears, 21 pear psylla
Postbloom or Summer (For codling moth, the first application should be made May 25-30. Repeat applications are necessary every 10 to 14 days until harvest. Other pests should be sprayed only when damaging populations are present.)	Aphids, spider mites	Insecticidal soap (follow manufacturer's label)	0
	Codling moth, mites, aphids, pear psylla, leafrollers	3 T Imidan 12 WP	7
		1 T diazinon 50 WP or	14
	Codling moth, mites, aphids, scale crawlers, leafrollers	2 tsp diazinon 25 EC	14
		2 T Sevin 40 EC or	1
	Codling moth, pear slug, fruitworms, scale crawler, bud moths, pear psylla, leafrollers	2 T Sevin 50 WP	1
		(Do not apply Sevin until 30 days after full bloom to prevent excessive thinning of fruit.)	
	Codling moth, leafrollers, cutworms, caterpillars	1 T Dipel (<i>Bacillus thuringiensis</i>)	0
	Mites	4 tsp Kelthane 9.5 EC	7
	Aphids	1 T nicotine sulfate 40 EC or	7
		Insecticidal soap (follow manufacturer's label)	0

Key: T = tablespoon; tsp = teaspoon; WP = wettable powder; EC = emulsifiable concentrate

Spraying Fruit Trees

Effective control results from the proper application of an appropriate pesticide at the correct time. No one chemical will adequately control all pests of apples and pears. The control of susceptible stages of any pest requires timing of treatments based on pest development. Generally, skips and misses in spray application will result in fruit damaged by insects and mites. This is particularly true for the codling moth.

Proper timing of application and thorough coverage of twigs, branches, leaves and fruit are as important as the chemical used. Spray both leaf sides until spray begins to drip.

Generally, an average 10-year-old fruit tree will need 4 or 5 gallons of dilute spray to thoroughly wet all the foliage. Dwarf trees require less spray.

Spray Timing

Dormant (February-April)

"Dormant oil" is a special-weight oil that suffocates eggs and scale insects. The spray may be mixed with some insecticides, if desired. Apply during late winter or early spring (February-April) when trees are dormant. This spray controls aphids, mites, pear psylla and scales and is necessary every year on badly infested trees. Do not apply when temperatures are below 45°F or when freezing temperatures are expected within 24 hours. Do not apply after the trees have begun to leaf out.

Prepink (Just before buds reach the pink stage before bursting)

Prepink spray consists of an appropriate insecticide (no dormant oil) applied just before the buds reach the pink stage before bursting. This spray is useful for controlling aphids, scales and some caterpillar pests. It is usually applied from mid- to late April. Usually, this spray is unnecessary if a dormant spray has been applied. However, if pest problems continue, you should use a prepink spray. To prevent the killing of pollinators, DO NOT use pesticides during the bloom period.

Postbloom or Summer

Postbloom or summer sprays are usually applied about 21 days after full bloom, generally in late May for the first spray. Use insecticides appropriate for the

pest. When multiple pest problems occur, appropriate insecticides may be mixed and applied as one spray or purchased as mixed sprays. These sprays are necessary for controlling the codling moth and for summer populations of aphids and the pear psylla. Codling moth control requires repeat sprays every 10 to 14 days through the season, unless you use *Bacillus thuringiensis*, which should be sprayed every 7 to 10 days.

Pesticide Formulation

Insecticides may be purchased as wettable powders (WP) or as emulsifiable concentrates (EC). Either kind must be diluted in a prescribed amount of water before being applied as a spray. Sprays made from emulsifiable concentrates require less agitation, but may burn tender foliage, especially when applied during the heat of the day. You can buy general purpose insecticide mixtures, which usually include some of the chemicals listed, to spray fruit trees.

Pesticide Residues

These recommendations for use are based on currently available labels for each pesticide listed. If followed carefully, residues should not exceed the established tolerances. To avoid excessive residues, follow label directions carefully with respect to rate, number of applications and minimum interval between application and reentry or harvest.

Groundwater

To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.

Trade Names

To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

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