

Control of

FILBERT INSECT PESTS



A Filbertworm Moth

COOPERATIVE EXTENSION SERVICE

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FILBERT INSECT PESTS

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Insect control is important in growing filberts. Insect pests destroy nuts, devitalize trees, and reduce nut yield and quality. Filberts are difficult to spray or dust because of their dense foliage. Thorough application of insecticides is essential. Timing is especially important in the control of filbertworm. Notices telling when to spray are sent to growers by county Extension agents. Commercial growers who wish to receive these notices should request that their names be placed on their county agent's mailing list. A simplified spray schedule for home orchards is available from Extension offices.

In the accompanying spray schedule, dosages are given in the amount of insecticide to be mixed with 100 gallons of water, as the spray would be applied by the bulk method using hand spray guns. Approximately the same amount of active ingredient is required if air-carrier sprayers are used to apply sprays in dilute form, as concentrates, or as semi-concentrates. The suggested amount of active ingredient per acre is the amount that would be required for mature trees. Experience with various types of spray equipment may enable growers to make economical and efficient modifications.

FILBERTWORM

Adult filbertworm moths have a wingspread of about one-half inch. The most distinctive feature is two golden bands across each forewing. These markings separate this insect from all other moths found in filbert orchards. Damage is caused by larvae feeding in the nuts. This direct damage to the nuts may be exceeded by a greater cost to growers for separating wormy nuts from undamaged ones at processing plants.

Filbertworms overwinter in silken cocoons found in the soil, leaves, and debris on the ground. Adult moths usually begin to emerge in early July, and emergence may continue into late August and early September. Egg laying begins soon after emergence. Eggs are laid singly on leaves, usually on the upper surface, and hatch in about eight or nine days.



Nuts showing entrance of a filbertworm larva through micropyle and exit through micropyle and side.

The newly hatched larva is active, moving about until it finds a nut. Entrance is made between the shell of the nut and the husk. When the larva reaches a point where the husk is tight against the nut shell, it begins to bore into the soft tissue of the husk next to the shell. When the basal scar is reached, the larva tunnels about until the micropyle is reached. Entrance is made through the micropyle which is in the center of the basal scar and is much softer than the rest of the shell.

On entering the nut, the larva begins to feed on the kernel. The larva is full grown in about 15 days after it enters the nut. Some larvae leave the nut immediately on reaching maturity; others, although full grown, remain in the nut until after harvest.

The first spray or dust application should be made within a few days after moth emergence. The extended period of emergence requires that two applications be made to insure control. The second application should be made about three weeks after the first.

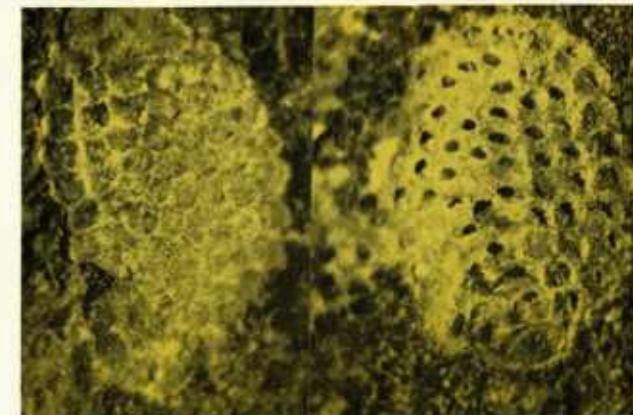
FILBERT LEAFROLLER

Adult filbert leafroller moths have a wingspread of about three-fourths of an inch. Generally, they are buff colored with darker irregular linear markings on the wings. The mature larvae are approximately three-fourths of an inch long, light green to dark green in color, with a dark head.

SPRAY SCHEDULE FOR FILBERT INSECT PESTS

Pest	Material	Amount per 100 gallons	Amount per acre
Apple mealybug	Sevin—50% W.P.*	2 lbs.	8 lbs.
	Parathion—25% W.P.	1 lb.	4 lbs.
	Malathion—25% W.P.	2 lbs.	8 lbs.
Filbert aphid	Systox—2 lbs./gal. E.C.†	1 pt.	2 qts.
	Thiodan—50% W.P., or 3% dust	1 lb.	4 lbs.
	Sevin—50% W.P., or 5% dust	2 lbs.	8 lbs.
	Diazinon—50% W.P.	1 lb.	4 lbs.
	Parathion—25% W.P.	1 lb.	4 lbs.
	Malathion—25% W.P., or 5% dust	2 lbs.	8 lbs.
Filbert leafroller	Thiodan—50% W.P., or 3% dust	1 lb.	4 lbs.
	Sevin—50% W.P., or 5% dust	2 lbs.	8 lbs.
	Diazinon—50% W.P.	1 lb.	4 lbs.
	Guthion—25% W.P.	2 lbs.	8 lbs.
	TDE—50% W.P., or 5% dust	2 lbs.	8 lbs.
	DDT—50% W.P., or 5% dust	2 lbs.	8 lbs.
Filbertworm	Sevin—50% W.P., or 10% dust	2 lbs.	8 lbs.
	Guthion—25% W.P.	2 lbs.	8 lbs.
	Guthion—2 lbs./gal. S.C.‡	1½ to 2 pts.	3 to 4 qts.
Omnivorous leaf tier	Sevin—50% W.P., or 5% dust	2 lbs.	8 lbs.
	DDT—50% W.P., or 5% dust	2 lbs.	8 lbs.

* W.P. = wettable powder. † E.C. = emulsion concentrate. ‡ S.C. = spray concentrate. Where dusts are recommended apply at the rate of 40 pounds per acre. To avoid illegal pesticide residues, do not apply parathion or TDE after husks open. Do not apply Systox within 40 days or Guthion within 30 days of harvest. There is no time limitation between application and harvest for Sevin, Thiodan, malathion, diazinon, and DDT.



Leafroller egg masses. Current year's mass with unhatched larvae (left) and year-old mass showing exit holes (right).

The most noticeable injury is the rolling of leaves associated with feeding of the larvae. The most serious damage is to young fruit buds—often severely damaged or cut off entirely. Heavy infestations can cause a serious reduction in nut production.

The insect overwinters in the egg stage. Eggs are laid in silvery masses, having the appearance of overlapping fish scales. Each egg mass contains about 50 eggs, and they are found on limbs and trunks of filbert trees. The eggs hatch in the spring, usually in early April. Mature larvae pupate within rolled leaves and emerge as moths during the latter part of June or in July.

The filbert leafroller can be controlled by insecticide applications timed to kill the young larvae soon after they have hatched from eggs.

FILBERT APHID

Immature filbert aphids are of a light green color. Mature or winged forms are darker. Heavy infestations reduce the percent fill and size of nuts. The damage caused by aphids is cumulative. Therefore, the benefits of control measures may not be observed the same season of treatment, but may become evident after two or more years of aphid control.

Aphids overwinter as small, dark colored, oval eggs attached to twigs and small branches of filbert trees. The eggs hatch during March, and the aphids move to the unfolding leaves where they feed. Aphid and leafroller control may be combined. Several insecticides are effective against both pests as indicated in the spray schedule.

Think of Your Neighbor

Don't "share" insecticides with your neighbor. Drift of some insecticides onto forage crops may result in illegal residues in milk if forage bearing these residues is fed to dairy cattle. This is particularly true of DDT, TDE, and Thiodan.

New housing developments are occasionally near or adjacent to filbert orchards. Sprays will be less objectionable than dusts under such circumstances. Parathion is a hazardous material, and its use is not recommended in populated areas where orchards are close to dwellings.

Insecticides used for control of filbert pests will kill bees. If beekeepers have bees next to filbert orchards, they should be warned to move them before spraying or dusting if there is any likelihood that drift will reach the hives.

FILBERT BUD MITE

Because of the microscopic size of the filbert bud mite, it is most easily recognized by the damage it causes. Damage is most severe to the loose-budded varieties such as Daviana and Royal. This pest has not been a problem with Barcelona.

The mite damages female flowers as well as leaf buds. The buds swell into typical "big buds," and deformed red flowers are produced which fail to produce fruit. Many pesticides have been tested against this pest, but no satisfactory control has been developed.



Normal filbert buds (top) and deformed buds (below). Bud mites seriously reduce yields—especially of loose-budded varieties.



Apple mealy bugs cause damage in some areas by feeding on filbert leaves and twigs.

APPLE MEALYBUG

Except for a few orchards, the apple mealybug has not been a serious pest. At the present time, known infestations are confined to a restricted area in northern Marion County, and limited areas in western Polk County, northwestern Linn County, and in Benton County.

The insect feeds by sucking plant juices. It secretes a honeydew-like material which is a good media for the growth of black sooty fungus. The young feed on leaves and tender twigs. Heavy infestations may lead to injury and premature dropping of leaves.

Eggs are laid by overwintering females during May. The eggs are found in masses, each containing about 500 or more eggs. During June the young emerge from eggs and crawl to young twigs and leaves where they feed.

Control measures should be applied in early spring, March 2 to April 15, when overwintering forms become active, or in July after eggs hatch—to control the young crawlers. Insecticides used in control of the filbertworm should help reduce the incidence of the apple mealybug.

OMNIVOROUS LEAF TIER

This insect occasionally causes damage to young filberts as a result of larval feeding on buds and leaves. When full-grown, larvae are about one-half inch in length and grayish yellow in color. Larvae have two light stripes and a darker central stripe on the back. Damage occurs during late April and May.

Four Keys to Pesticide Safety

1. Label
Read everything on the label and follow instructions to the last word.
2. Use
Use the correct chemical at the right time for the job to be done. Use the appropriate respirator when required. Wear the prescribed type of clothing or skin covering as noted on the label or on special instructions. Keep children away from mixing, dusting, or spraying areas.
3. Storage
All agricultural chemicals should be stored in a cabinet, room, or building that can be locked. Chemicals should be stored where there is no chance of contact with human food or livestock feeds. Keep chemicals in their original containers—never in pop bottles, canning jars, or other unmarked containers, especially those used for food and drink. To protect children and animals, promptly return to safe storage unused portions that you wish to keep.
4. Disposal
Never throw chemical containers or small leftover amounts in garbage cans or dumps accessible to children. Dispose of empty chemical containers immediately. Crush, break, and bury metal or glass chemical containers whenever possible. When burning containers, avoid inhaling the fumes. Gasses released by heat may be extremely poisonous.

USE PESTICIDES SAFELY

With the exception of parathion, which is a highly toxic pesticide, the insecticides suggested in this circular are among the less hazardous materials to spraymen. But all pesticides should be handled with care. Follow the manufacturer's precautions on the pesticide label. These are not intended to frighten the user, but to impress upon him the need for careful use of pesticides.

