
FRUITTREE LEAFROLLER ON ORNAMENTAL AND FRUIT TREES

Integrated Pest Management for the Home Gardener

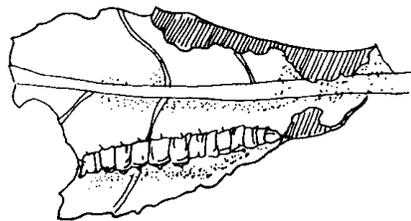


Figure 1. Fruittree leafroller

Fruittree leafroller, *Archips argyrospila* (Fig. 1), can be a serious pest throughout California. It occurs on a very large number of ornamental trees and is particularly damaging to deciduous and live oaks. This leafroller also is found on ash, birch, California buckeye, box elder, elm, locust, maple, poplar, rose, and willow. It attacks numerous fruit and nut trees, including almond, apple, apricot, caneberries, cherry, citrus, pear, plum, prune, quince, and walnut.

DESCRIPTION

Fruittree leafroller goes through four stages of development: egg, larva (or caterpillar), pupa, and adult (or moth). The eggs are laid in irregular flat masses primarily on twigs and smaller branches. The egg mass is coated with a dark gray or brown cement that bleaches and later turns white; this covering becomes perforated (pinholes) in spring as the larvae hatch and emerge through it.

A newly hatched larva is entirely green except for a black head and small hard plate just behind the head. As the larva matures, its head turns dark brown and the plate becomes a

tan to olive-green color. At maturity the larvae are $\frac{3}{4}$ to 1 inch long. They wriggle vigorously when disturbed, and often drop to the ground on a silken thread. The pupa is just under $\frac{1}{2}$ inch long, light to dark brown, and is usually formed within the rolled leaf. Silk webbing lines the area around the pupa.

The adult moth has a wing span of $\frac{5}{8}$ to $\frac{7}{8}$ inch. Like other leafrollers, its wings have a bell-shaped outline when viewed from above. The forewings are mottled shades of brown and tan with gold-colored flecks, while the hind wings are whitish to gray.

LIFE HISTORY

Fruittree leafroller overwinters as an egg. Eggs hatch into tiny larvae in spring from March to as late as mid-May in cooler areas. Larvae feed on leaves for about 30 days and then pupate in a loose cocoon formed in a rolled leaf or similar shelter. Eight to 11 days later the adult emerges from the pupa. The moths live only about a week, during which time they mate and lay eggs. They fly from May to June in various localities, and in any one area the flight usually lasts about 3 weeks. Only one generation occurs each year.

DAMAGE

The larvae feed on tender new leaves, giving them a ragged appearance. Leaves are rolled and tied together with silken threads so as to form compact hiding places. Some years very large populations develop. In severe cases trees may be partially or com-

pletely defoliated with numerous silken threads covering the entire tree and the ground below. Also, larvae frequently drop to the ground on their silken threads and may defoliate grass or other plants beneath the trees. Even if completely defoliated, however, trees that are otherwise healthy can be expected to recover.

Oaks in the Central Valley can be particularly hard hit. Some people mistake fruittree leafroller for California oakworm because of its prevalence on oaks. However, oakworm is a more serious pest in coastal areas while fruittree leafroller does the bulk of the defoliation damage to oaks in the Central Valley. The two caterpillars are easy to distinguish: fruittree leafroller is green with a black head, and California oakworm has yellow, black, and gray stripes on its side and a large brown head. (For more information, see *Pest Notes: California Oakworm*, listed in the References section.)

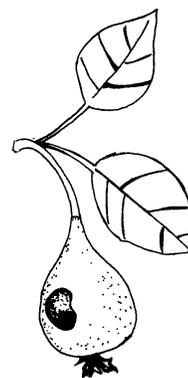


Figure 2. Leafroller damage to young fruit.

PEST NOTES

Publication 7473

University of California
Division of Agriculture and Natural Resources

March 2000

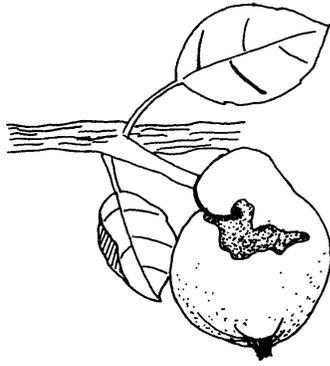


Figure 3. Fruit that was damaged when it was young.

Fruit on trees are also attacked by the larvae, and young fruit (Fig. 2) may fall because of deep feeding grooves made just after the fruit has formed. Less severely damaged fruit remain on the tree and develop characteristically deep, bronze-colored scars with roughened netlike surfaces that are mostly cosmetic, although the fruit may be deformed (Fig. 3).

BIOLOGICAL CONTROL

A number of insects utilize the fruittree leafroller as food: certain tachinid flies and ichneumonid wasps appear to be its main parasites, while lacewing larvae and certain beetles are its most common predators. Birds sometimes feed on the larvae and pupae but seem to prefer other insects. These natural enemies often help to keep the fruittree leafroller at low, nondamaging levels, but even in their presence outbreaks of large numbers of leafrollers occasionally occur.

CONTROL BY SPRAYS

Bacillus thuringiensis (sold as a variety of products) is effective against the larval stages of the fruittree leafroller. Bt, as it is commonly known, is a bacterial preparation that causes a disease in many kinds of caterpillars but does not harm beneficial insects, birds, man, or other organisms. Fruittree leafrollers stop feeding within hours after feeding on a sprayed leaf and die several days

later. Thorough spray coverage of the tree is required for control. (Bt will also control other caterpillars present at the time of application.) Bt is only effective on fruittree leafroller larvae when they are small (less than 1/2 inch long) and usually requires more than one application. Caterpillars must ingest the pesticide to be killed.

Carbaryl (Sevin) and diazinon are two other insecticides that can be effective against leafroller larvae, but their use should be avoided where possible because of negative impacts on natural enemies and other wildlife. Do not apply carbaryl around flowering time: it is highly toxic to honey bees. Diazinon has been associated with damage to aquatic organisms and birds. Neither of these materials, but especially diazinon, should be applied in a manner that will result in runoff into storm or sewer drains and thus contaminate water supplies or natural waterways. Always read the label to determine if the type of tree or ornamental that is to be treated is listed.

Optimum control and a minimum amount of damage by fruittree leafrollers occur when a spray is applied at the time of larval hatching or shortly afterwards. To determine this time, inspect twigs showing flushes of new foliage and look for feeding injury and the small caterpillars. If egg masses are found, check them regularly for signs of larval exit holes. Fruit trees must be sprayed no later than petal fall to prevent larval injury to the young fruit. In spraying, a high-pressure spray (such as can be obtained with a power sprayer or hose-end sprayer) is needed to force the material into the leaf rolls and other protected areas where larvae are found.

Sprays for fruittree leafroller are not necessary every year. Apply sprays only when there is evidence of a damaging leafroller population, such as large numbers of larvae early in the spring or large numbers of egg masses. Remember that this pest has only one generation a year. Once

trees are severely defoliated, the caterpillar stage may be almost completed, and sprays will be of no benefit.

Insecticidal oil sprays applied in dormancy for scales and other insects will help control leafroller eggs.

OTHER LEAFROLLERS

Various leafrollers other than the fruittree leafroller attack the same plants. The obliquebanded leafroller appears about the same time in spring as the fruittree leafroller and resembles the fruittree leafroller as a larva. The obliquebanded leafroller, however, has multiple generations each year and is present throughout the summer. Another leafrolling caterpillar, the orange tortrix, occurs throughout the year. As a larva, it is about 1/2 inch long when mature and varies in color from light green to tan. The activities of these leafrollers are similar to those of the fruittree leafroller, but unlike the fruittree leafroller, which overwinters in the egg stage, these two species overwinter as larvae.

COMPILED FROM:

Moore, W. S., C. S. Koehler, and L. S. Frey. 1982. *Fruittree Leafroller on Ornamentals and Fruit Trees*. Oakland: Univ. Calif. Div. Agric. Nat. Res. Leaflet 21053.

REFERENCES

Dreistadt, S. H., J. K. Clark, and M. L. Flint. 1994. *Pests of Landscape Trees and Shrubs: An Integrated Pest Management Guide*. Oakland: Univ. Calif. Div. Agric. Nat. Res. Publ. 3359.

Flint, M. L. 1998. *Pests of the Garden and Small Farm: A Grower's Guide to Using Less Pesticide*. 2nd ed. Oakland: Univ. Calif. Div. Agric. Nat. Res. Publ. 3332.

UC Statewide IPM Project. *Pest Notes: California Oakworm*. In press. Oakland: Univ. Calif. Div. Agric. Nat. Res. Publ. 7422. Also available online at: <http://www.ipm.ucdavis.edu/PMG/selectnewpest.home.html>

For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

CONTRIBUTORS: W. Bentley, C. Pickel, D. Rice, R. Van Steenwyk

EDITOR: B. Ohlendorf

TECHNICAL EDITOR: M. L. Flint

ILLUSTRATIONS: A. Child

DESIGN AND PRODUCTION: M. Brush

PRODUCED BY IPM Education and Publications, UC Statewide IPM Project, University of California, Davis, CA 95616-8620

This Pest Note is available on the Web Wide Web (<http://www.ipm.ucdavis.edu>)



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

This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits and/or vegetables ready to be picked.

Dispose of empty containers carefully. Follow label instructions for disposal. Never reuse the containers. Make sure empty containers are not accessible to children or animals. Never dispose of containers where they may contaminate water supplies or natural waterways. Do not pour down sink or toilet. Consult your county agricultural commissioner for correct ways of disposing of excess pesticides. Never burn pesticide containers.

The University of California prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or status as a covered veteran (special disabled veteran, Vietnam era veteran, or any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized). University Policy is intended to be consistent with the provisions of applicable State and Federal laws. Inquiries regarding the University's nondiscrimination policies may be directed to the Affirmative Action/Staff Personnel Services Director, University of California, Agriculture and Natural Resources, 1111 Franklin, 6th Floor, Oakland, CA 94607-5200; (510) 987-0096.