

Fruit Tree Leaf Roller

this year's infestation indicates need for next year's spring treatment against fast-spreading citrus pest

E. Laurence Atkins, Jr.

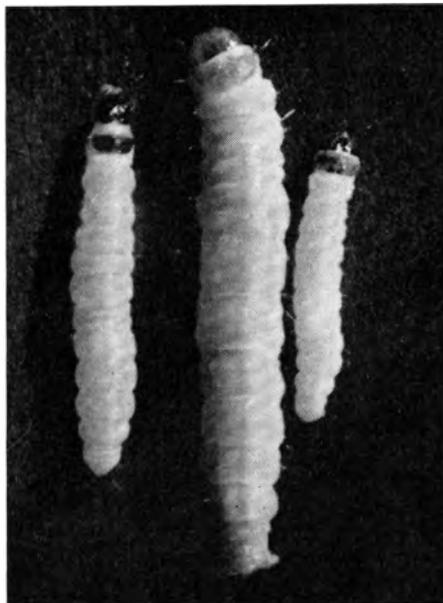
Damage by the fruit tree leaf roller is held to a minimum if an effective insecticide—DDT, DDD, parathion, or EPN—is applied seven to 14 days after egg hatching begins.

If a grove infested with the larvae of the fruit tree leaf roller is treated too late or not at all, the grower may experience up to 75% destruction of the spring flush of foliage, as much as 95% scarring or loss of the setting fruit of the new crop of oranges, and up to 20% loss or ripe navel and ripening Valencia oranges as a result of holes eaten into the peel by the worms.

If an infested grove is treated seven to 14 days after egg hatching begins, the grower may expect less than 5% damage to the foliage of the spring flush of growth and to the blossoms and newly setting crop and no damage to ripe navel or ripening Valencia oranges.

The fruit tree leaf roller, *Archips argyrospila* (Walkr.), has become an important pest of citrus in the past five years in southern California. The infestation began 1947 on a few acres in San Bernardino County and spread every year, reaching 7,500 acres in 1951. Observations last summer indicate that the infested area will be larger in 1952.

Groves containing light to heavy infestations—untreated groves and those treated either commercially or experimentally—were observed for three years. The most significant new advance in the



Fruit tree leaf roller larvae. Left, half grown; center, fully grown; right, one-third grown. Enlarged $3\frac{1}{2}$ times.

control of the larvae of the fruit tree leaf roller consists in the proper timing of insecticidal control measures.

Growers are advised to contact the citrus pest control specialists in their district when in doubt as to whether to treat against the larvae of the fruit tree leaf roller and to ascertain when the egg hatch will be far enough along so treatment may be promptly made.

Observations during the past two years have provided criteria for determining the desirability of insecticidal applications to control the larvae of the leaf roller. If an orange grove is heavily infested this year and is not treated, or not treated at the proper time, to reduce sufficiently the larval population, it probably will need treatment next spring.

If 10 unhatched egg-masses can be found before the middle of March after inspecting a tree for 10 minutes, treatment probably is necessary. It is not sufficient to inspect a tree from the ground only, since 75% of the egg-masses occur in the upper fourth of the tree—especially on the branches one-half to one and a half inches in diameter. Six trees should be inspected in each five acres of grove. Hatched egg-masses from the previous season have a larval exit hole in each of the individual eggs within the group and, therefore, may be differentiated from unhatched egg-masses.

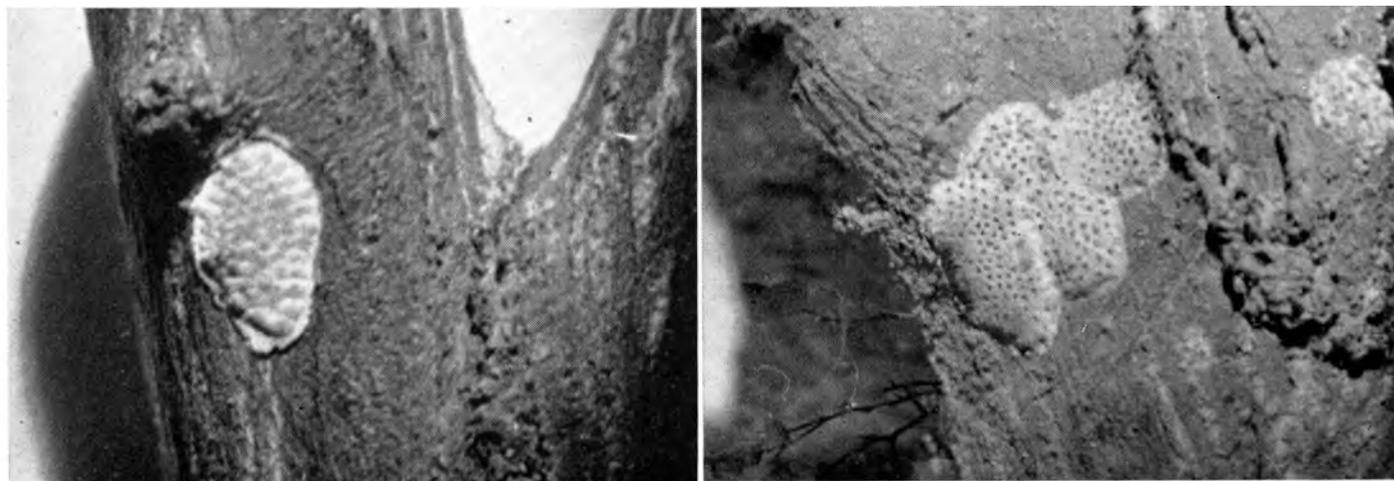
Timing of Treatment

Insecticidal applications properly correlated to egg hatch will insure the grower of a minimum of damage to the foliage, blossoms, newly set fruit and mature navel and ripening Valencia fruit.

Eggs will probably begin to hatch shortly after mid-March. Insecticides for control should be applied as soon as

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Left, unhatched egg masses of the fruit tree leaf roller on citrus twigs, typical for the period before mid-March. Right, hatched egg masses in April, showing larval exit holes in each individual egg within the group.



ROLLER

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practicable after an average of 25% of the eggs in the egg-masses have hatched and not later than 50% egg hatch. This interval usually occurs about seven days—25% hatch—to 14 days—50% hatch—after egg hatching commences. All timing experiments have shown that treatment applied early—at the beginning of the egg hatching period—is more successful and desirable than a late treatment—at the completion of the egg hatching period.

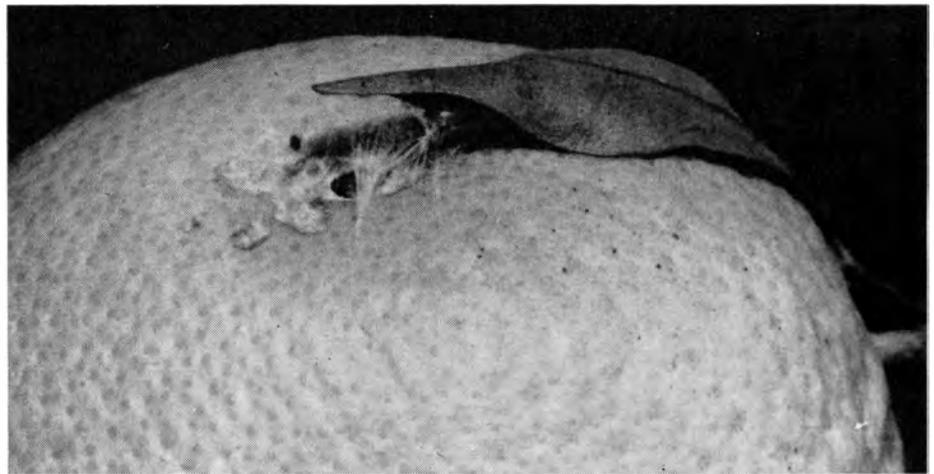
Egg hatching continues for an interval of approximately five weeks, although most of the eggs commence to hatch at the same time in any one area so that about half the total number of larvae have emerged within two weeks of the initial hatch. Therefore it is necessary to: 1, set up the check trees before mid-March so that egg hatching will not have begun; 2, choose six average-sized trees in each five acres of grove—these trees should be at least four trees within the border of the grove; 3, place numbered tags or other means of identification on or near 10 egg-masses in the top of each of the chosen trees; 4, determine the total number of eggs in each egg-mass when the masses are first chosen so that the percentage of hatch can be obtained; and 5, record the accumulated total number of hatched eggs—exit holes—every two days.

Insecticide Formulations

Larvae of the fruit tree leaf roller can be controlled by sprays and dusts.

For application with a speed-type sprayer using 500 gallons of water per acre, or with a spray-duster or boom

Fruit tree leaf roller, adult moth.



Larval injury to Valencia fruit, showing larva, injury, and nest on fruit.

sprayer using 300 to 500 gallons of water per acre, one of the following insecticides may be used:

DDT, 50% wettable powder, 6 pounds.

DDD, 50% wettable powder, 6 pounds.

Parathion, 25% wettable powder, 3 pounds.

EPN, 25% wettable powder, 3 pounds.

Fruits should not be picked for 30 days after a parathion or EPN application.

For application with a fish-tail duster—high capacity fan type—at the rate of 75 pounds per acre, 5% DDT or 5% DDD may be used.

These formulations may be made stronger, or other insecticides added, if other citrus pests are also a problem.

Orange Tortrix

To control the orange tortrix together with the leaf roller, the dosages for spray application should be raised to nine pounds of DDD, 50% wettable powder, or six pounds parathion or EPN, 25% wettable powder. For dust application, 5% DDD at the rate of 90 pounds per acre should be used.

To reduce tree smutting by black scale, wettable sulfur may be added to the leaf roller spray formulas, or dusting sulfur used in place of part or all the diluent in dusts.

Aphis Control

Aphis may be controlled by combining one quart of 20% TEPP per acre to the leaf roller spray formulas. Two quarts of 40% nicotine sulfate are also effective but more expensive.

Parathion, used at higher dosages in addition to controlling the leaf roller larvae, will also check California red scale, katyids, and will reduce citrus aphis.

Citrus tree deficiencies may be corrected by adding the appropriate minor element to the leaf roller formula. Neutral

preparations of zinc, copper, and manganese are compatible with all four suggested insecticides.

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PERISHABLES

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face exposure such as leafy vegetables or small fruits, and can best be controlled by lowering the commodity temperature and holding the product in an insulated or closed compartment.

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The above article is a condensation of the more detailed report: Air Transportation of Fruits, Vegetables and Cut Flowers: Temperature and Humidity Requirements and Perishable Nature. L. L. Claypool, L. L. Morris, W. T. Pentzer, and W. R. Barger, U.S.D.A., H. T. & S. Office Report No. 258.

WALNUTS

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To reduce the danger of mites becoming a serious problem, a grower should keep his orchard in a vigorous growing condition and never let it suffer for want of water. In his insect control program, he should avoid frequent treatments, by using effective insecticides at adequate dosages and applied with efficient equipment under weather conditions that will insure satisfactory control.

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