

EXPERT COMES TO HELP FIGHT PRUNE THRIPS

Professor Lovett to Arrive in Salem and Inspect Near-by Orchards

OTHER PARTS AFFECTED

Treatise Shows Life History and Antidote for Newly Found Pest

The prune thrips which has been reported from the Liberty district as doing serious injury to the developing fruit buds is evidently present in other orchard districts in the vicinity of Salem. College authorities consider the situation serious and advise growers to spray at once.

The situation was sufficiently alarming that Robert Paulus, Knight Percy and Lee Lane took specimens of the infested twigs to O. A. C. for inspection. Professor Lovett diagnosed the trouble as due to the work of the thrips. Because of the gravity of the situation, Professor Lovett plans to visit the Salem prune districts today and attempt to outline the extent and severity of the infestation.

In the meantime, because of the urgent nature of the case, Professor Lovett makes the following statement:

"Growers should make a careful examination of their orchards for the thrip. Break off twigs here and there through the orchard, place them in a paper sack and in a warm room after jarring the sack well examine for the small elongate, active brown thrips. They are about 1-20 inch long, move with a gliding motion and hop when disturbed.

"Where an infestation occurs; providing the blossoms are not yet open, spray at once with the following solution: Fish oil soap, 10 pounds; black leaf 40, 1 1/2 pints; water, 200 gallons. One should have a large kettle or vessel outside in which the soap may be heated in a small amount of water to dissolve it.

The solution should be applied with considerable pressure, 175 to 225 pounds and as a driving spray. For very tall trees a tower is advised.

SPRAY FOR THRIPS

For thrips on prunes, pears and plums use Black Leaf 40 Spray. Use 3-4 lbs. of Black Leaf, 4 lbs. Fish Oil Soap to each 100 gallons of water. Use power sprayer and spray in very best possible way, both on top and under leaves and blossoms. Spray at once, if thrip is showing in your orchard, if you want to save your crop.

We have a large stock of Black Leaf 40 for usual requirements, but will not last long if this disease is general, so buy now and be prepared.

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able; take time to be thorough. Theoretically for the average eight year old orchard about 125 to 150 gallons of spray will be required to the acre. To effectually handle the situation requires immediate intelligent effort.

Professor Lovett's headquarters while in Salem will be, during the day at the Salem Fruit union. He will stop at the Marion hotel.

County Fruit Inspector S. H. Van Trump and Mr. Paulus have procured for the benefit of growers a treatise prepared in California which will apply to the Willamette valley orchards with the exception that to apply here the date given should be set ahead from four to six weeks. The treatise follows:

Distribution: The pear thrips is at the present time very destructive in San Francisco bay region and in the larger part of the Sacramento valley of California. More recently it has been found in destructive numbers throughout New York state and northwestern Pennsylvania.

Economic importance: It is at the present time the most important in-

sect pest with which the growers of deciduous fruits in the sections mentioned have to contend. On account of the minute size of the insect, the rapidity of its spread over larger areas, and the suddenness of attack in great numbers, completely blasting in a few days all prospects for a crop, the control of this pest is a matter of considerable difficulty. As the insect each year is extending its range of food plants, its capabilities for dissemination are correspondingly increased. There is no reason to believe that the insect will disappear. It should be regarded as a permanent and serious pest. Conservative estimates place the damage caused by the pear thrips in California during the years from 1904 to 1912 at least \$6,000,000. It is safe to say that the thrips in the absence of treatment would cause an average yearly loss to the state of over \$1,000,000.

Character of injury: This species of the various fruit trees by its feeding is caused by the feeding of the adults on the developing buds and yearly blossoms, by the deposition of eggs into the fruit stems, leaf stems, and newly formed fruit, and by feeding of the larvae in the blossoms and on the young fruits and foliage. On pears the greater injury is produced by the adults, which often prevent the trees from blooming, while on the prunes and cherries the larvae frequently prevent a crop of fruit from setting after the trees have come into full bloom, also the deposition of eggs into the fruit stems of the prunes and cherries so weakens the stems that much of the young fruit falls. By rasping the tender surfaces in the developing fruit buds the young fruits with their hardened mouthparts, the thrips rupture the skin, causing an exudation of sap which is often followed by more or less fermentation, especially before blooming. The feeding by larvae on prunes after blooming causes the well known thrips "scab," while most of the scarred and misshapen pears are caused by the work of the adults.

LIFE HISTORY

Adults

The adults or winged form of the thrips appear on the trees about the middle of February appearing in greatest numbers in late February and early March.

By the time the fruit buds have swollen sufficiently to separate the bud scales slightly at the tip the adults force their way within, feeding upon the tenderest portions inside the buds.

Eggs

As soon as the first leaf surfaces or fruit stems are exposed, egg-laying usually begins, depending somewhat on the variety of fruit attacked.

Egg-laying begins the first day of March and continues until the middle of April. Most of the eggs are deposited just under the epidermis in the fruit stems, young fruit and leaf stems. The eggs require about eight days to hatch.

Larvae

By the time the leaves are breaking into full bloom the adults have done most of the damage caused by their feeding, and oviposition is at its height. Many of the earlier appearing adults are dying off and larvae are beginning to appear in numbers. The very first larvae can usually be found about March 20th, and are in maximum numbers on the trees, feeding on the small fruit and young foliage, from the first to the middle of April. Reaching their full development, the larvae drop from the trees of their own accord or with falling calyxes, or are blown by wind or knocked off by rain. After the middle of April the number on the trees diminishes rapidly and by the last of April all the larvae are off the trees and in the ground. Here they work down into the first three or four inches of hard soil below the loose surface mulch and construct a tiny cell, where they remain until the following spring.

Pupae

The larvae mostly remain as such in these cells until September, when pupation begins, pupae being most abundant during October and November. Many adults can be found in the ground in December, and by the first of January practically all the thrips are in the adult stage and apparently ready to emerge and go in to the trees whenever conditions are right. Broadly speaking, the thrips spend two months in the year in the adult, eggs and larval condition on the trees and the other ten months of the year as larvae, pupae and adults in the ground.

CONTROL MEASURES

The pear thrips is in some respects an unusual insect in that it remains in a dormant or semi-dormant condition for about ten months of the year. Although on the trees for only two months out of the twelve, it is able in this short time, in the absence of treatment to completely destroy all prospects of a crop of fruit, in many cases within a very few days. The trees are attacked at the period of budswelling and blossoming, when they are most susceptible to injury. These minute insects literally come in in swarms, and may, if left alone, completely destroy all of the fruit buds of an orchard in four or five days. Many cases have been known where a delay of four or five days in spraying resulted in loss of the entire crop of fruit, and in some cases half of the buds were killed in three days after the thrips appeared on the trees in great numbers. In view of this condition it is very evident that any means of control must be very thorough and done in the most exacting manner at the proper time.

CULTIVATION

On gravelly or sandy soils plowing to a depth of from seven to nine inches results in killing from 40 to 50 per cent of the thrips present in the soil, but not a sufficient control, as enough thrips escape to cause great injury to the buds the following spring.

SPRAYING

A tobacco extract containing 2 1/2 per cent nicotine, diluted at the rate of 1 to 50 in a 6 per cent distillate-oil emulsion, kills all the thrips touched and penetrates well into the pear cluster buds. The pubescent covering of the individual buds in

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the cluster, being resistant to water, seems to act in the distillation in distillate-oil emulsion in much the same manner as the wick upon oil in a lamp.

DISTILLATE-OIL EMULSION HOME MADE PREPARATION

To make soap use this formula or some multiple of same:

Water, gallons 6
Lye (98 per cent) pounds 2
Fish oil, gallons 1 1/2
Put the water in a cauldron or boiler and add the lye. When the lye is thoroughly dissolved and the water boiling, pour in the fish oil stirring in the meantime, and boil slowly for two hours. When the soap has boiled sufficiently it should give a rosy effect when stirred and brought up with the ladle. This formula gives about 40 pounds of moderately firm soap.

Growers are cautioned to buy only genuine fish oil and not a fish oil compound or mixture of fish oils and vegetable oils. Herein lies part of

the secret of penetrating efficiently of the distillate emulsions made by using animal oil soap as the emulsifier. The cost of the soap is \$0.165 per pound made from fish oil at 35 cents a gallon.

The distillate oil stock emulsion should be made as follows:

Hot water (boiling) gallons 12
Fish oil or whale oil soap, pounds 30
Distillate oil (raw) 24 to 40 de-

grees Baumé, gallons 20

Have the water boiling hot when put into the spray tank and the soap immediately while the agitator is running at a good speed. When the soap is all thoroughly dissolved, pour in the oil slowly, keeping the mixture well agitated while the oil is going into the tank.

For a spray tank of 200 gallons capacity, five times this formula can be made at one time.

When all the oil is in and well mixed, pump out through the nozzle at a good pressure (not less than 175 pounds) into storage tanks.

No one should attempt to make this stock emulsion without a proper spraying machine, as thorough agitation and high pressure are important requisites. Also, care should be used in having measurements reasonably exact, the water boiling hot and soap dissolved thoroughly before any oil is put in. This stock emulsion contains approximately 55 per cent oil, and to make a 3 per cent emulsion use five and one-half gallons of this stock in each 100-gallon tank. To dilute, first put the stock emulsion in a spray tank (have the agitator going) and then add the water, keeping the agitator running all

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the time. This is important with the commercial preparations as well as with the home made emulsions. For the combination sprays of all emulsions and nicotine solutions the nicotine should be added last, that is after the oil emulsion has been

diluted to the desired strength. These solutions should not be mixed together without first diluting one of them.

This concentrated emulsion will cost the grower about 5 cents per

(Continued on Page 8)



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