TAENIOTHRIPS ORIONIS OVIPOSITION AND FEEDING INJURY ON CHERRIES[1]

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ABSTRACT

Oviposition by overwintered **Taeniothrips orionis** Treherne in the ovaries of cherry flowers and immature fruits during early May caused injury which resulted in dimple-like depressions on the mature fruits. The damage was widespread in the Okanagan Valley in 1971. First brood adults oviposited in cherry fruits during late June and early July but the injury caused at this time was less pronounced. Feeding injury by larvae caused russeting on fruits and chlorotic areas paralleling secondary veins on leaves.

Treherne (1924) described *Taeniothrips orionis* from specimens collected in the lower Fraser Valley of British Columbia on *Acer macrophyllum*, cultivated apple, pear and *Nuttalia cerasiformis*. Bailey (1949) redescribed the species and mentioned that it is most commonly found at high elevations during the spring and summer in the flowers of various shrubs and trees. He listed the distribution of *T. orionis* as British Columbia, Washington, Montana, Wyoming, Colorado and California. Bailey and Knowlton (1949) recorded it from Utah. The first reported instance of economic injury by *T. orionis* was on cabbage, lettuce and potatoes, near Kenai, Alaska (Washburn, 1958). The following describes oviposition injury by adults and feeding injury by larvae of *T. orionis* on cherry.

In mid-May, 1971, approximately 2 weeks after full bloom of sweet cherries, very small depressions similar to a pin prick were observed on cherry fruits. At this time the cherry fruits were approximately 5 mm in diameter and the injury was not very discernible. As the fruits developed the injured tissue around the depressions failed to grow as rapidly as uninjured tissue, which resulted in the formation of dimples (Figure 1). A large number of cherry fruits were dissected during the 3rd week of May and a few thrips eggs were found in small cavities beneath the epidermis at the bottom of the dimples. No adult thrips were found on the cherry trees at this time but 1st and 2nd instar thrips larvae were common on leaves. Adults reared from collections of these nymphs were identified as *T. orionis* by Dr. W. R. Richards, Entomological Research Institute, Ottawa. Presumably overwintered adult *T. orionis* oviposited in the flower ovaries during bloom or shortly after.

In cherry orchards where thrips larvae were extremely abundant, feeding on the epidermis of fruits caused a noticeable russeting (Figure 2). Severely russetted fruits split as they grew due to the inability of the injured epidermis to expand. Larvae feeding on leaves caused the injury shown in Figure 3. The injury was restricted to the lower surface and was most common on young succulent leaves. The injured areas were chlorotic and tended to be distributed parallel and adjacent to secondary veins.

Oviposition injury on fruits was most obvious during the latter 2 weeks of June when the fruits began to color. The dimples turned deep red while the rest of the fruit was pale (Figure 4). When the cherries ripened and the red color was uniform, the dimples were less noticeable (Figure 5).

First generation larvae matured to adults during the 3rd and 4th weeks of June. Females of this generation also oviposited in the fruits. At this time the fruits were nearly full size, therefore the oviposition sites did not develop distinct dimples. The oviposition scars were difficult to differentiate from lenticels until the eggs hatched. After the eggs hatched the scars were slightly larger than lenticels. Eggs were also laid in leaf petioles and main veins. Second brood larvae fed mainly on young succulent leaves and matured to adults during the last week of July and the 1st week of August. No evidence of a 3rd brood on cherry trees was observed.

Injury was more variable between orchards than within orchards, and all varieties of sweet and semi-sweet cherries were susceptible. Approximately 10% of the total cherry crop in

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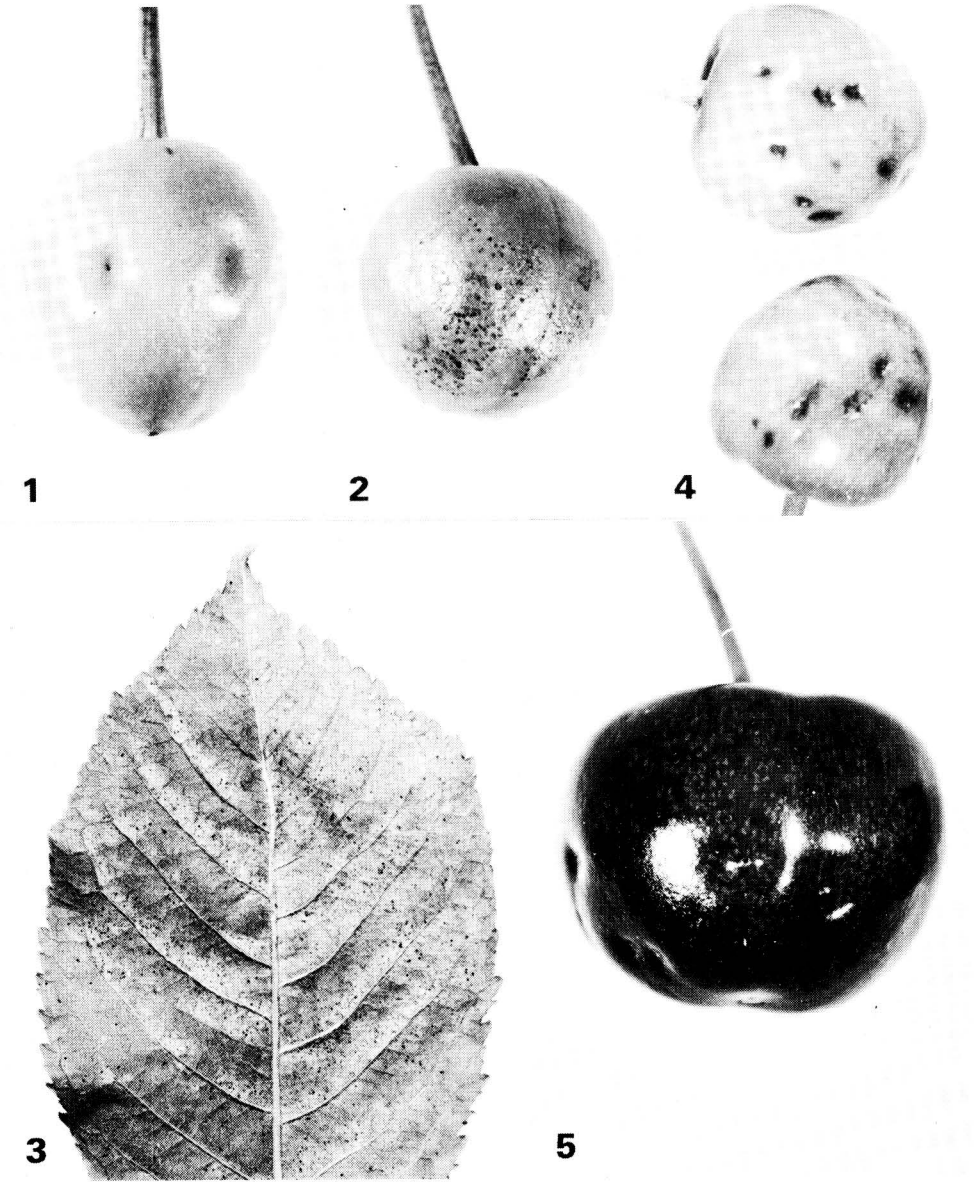

Fig. 1. Dimples on immature fruit caused by oviposition at, or shortly after bloom.
Fig. 2. Larval feeding injury on an immature fruit.
Fig. 3. Larval feeding injury on a leaf.
Fig. 4. Appearance of dimples on fruit in late June. The injured areas were deep red, the remainder of the fruit pale yellowish-green.
Fig. 5. Dimples on a mature fruit.

the Okanagan Valley was affected. Injury varied from 0 to 2% in orchards which were sprayed with diazinon at petal fall for control of fruittree leafroller. Diazinon, 2 quarts 50% E.C. per acre applied on June 29 gave 100% reduction of adult and late instar larvae.

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EROSION OF AZINPHOSMETHYL FROM APPLE LEAVES BY RAIN AND OVERTREE IRRIGATION[1]

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ABSTRACT

Three sprays of azinphosmethyl wettable powder were applied for seasonal control of the codling moth, **Laspeyresia pomonella** (l.), in a semi-dwarf apple orchard. A rain of 1.75 cm, occurring 6 hours after a spray application, removed 41% of the deposit from the leaves; a rain of 1.00 cm, occurring 16 days after an application, did not remove any residue. Residues in the treetops were eroded more rapidly in blocks with overtree irrigation than in those with undertree irrigation. But there was no difference in the erosion rate in the overtree-irrigated orchard whether 5.1 cm of water was applied biweekly or 2.5 cm was applied weekly. There was a trend to poorer control of the codling moth with overtree irrigation.

INTRODUCTION

There has been concern for many years that overtree irrigation of apple trees may remove pesticides and thus reduce control of the codling moth, *Laspeyresia pomonella* (L.). In a small-scale experiment in 1961 with Golden Delicious trees, Williams showed that 1 overtree sprinkling, applied 5 days after a spray of azinphosmethyl, removed a large amount of the residue and that a rain of 0.33 cm that fell 2 days after spraying removed an even larger amount. A number of workers have investigated the influence of rain, or simulated rain, on the removal of other pesticides. Much of this work is summarized by Ebeling (1963) and Linskens, Heinen, and Stoffers (1965). Our experiment, conducted throughout the 1971 growing season, was designed to measure the effects of overtree irrigation on the erosion of azinphosmethyl residues from apple leaves and on the control of the codling moth. The amounts of residue removed by rain were also measured whenever possible.

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MATERIALS AND METHODS

The experiment was conducted in 3 adjacent blocks (I, II, III) of semi-dwarf apple trees on M.VII rootstocks. There were 8 varieties in each block, planted randomly. Each block consisted of 7 rows with 12 to 15 trees per row. The rows were spaced 4.6 m apart and the trees 2.3 m apart. Height of the trees was about 3.7 m.

Each block was divided into 4 plots of 3 rows each; the 7th row served as a buffer between the sprayed plots. Three sprays of 50% azinphosmethyl wettable powder were applied for codling moth control on 2 June, 23 June, and 28 July, at the currently recommended rate of 0.23 kg / ha in plot 1, and at rates of 0.17 and 0.11 kg / ha in plots 2 and 3 respectively. Plot 4 was sprayed with water only: it served as a check on codling moth infestation at harvest and as a blank for residue analysis. No other pesticides were applied during the season. The sprays were applied with an experimental, low-volume, airblast