It was obvious, from both criteria, that DDT, although used at double the strength recommended in previous control charts, did not give satisfactory control.

Although no counts were made of aphid populations, it was observed that they were numerous enough to cause considerable injury to plants in the check plots and to those treated with Thuricide. They increased less rapidly on plants receiving DDT, and were not observed on those treated with Dibrom or Phosdrin. This may have accounted in part, at least, for the larger heads produced in the plots treated with Dibrom or Phosdrin.

We should like to express our thanks to Mr. E. M. King, Horticulturist (Vegetables), B.C. Department of Agriculture, Kelowna, for indicating the need for the experiment and for arranging for a suitable experimental site.

EFFECT OF TWO SPRAY PROGRAMS ON LEAFHOPPERS IN CHERRY ORCHARDS IN THE KOOTENAY VALLEY OF BRITISH COLUMBIA[1]

W. H. A. WILDE[2]

Introduction

The purpose of this paper is to present results of an experiment to assess the value of dieldrin ground sprays as compared to DDT and Sulphenone tree sprays for control of leafhoppers in sweet cherry orchards. Assessments of spray programs were made by comparing the numbers of leafhoppers caught on sticky boards in the tree canopies (2). Spraying tree canopies with DDT and Sulphenone was a procedure used by some Kootenay Valley growers for controlling leafhoppers and mites. Dieldrin was selected for use as a ground spray because of its reported residual action against earwigs, spittle bugs, and thrips, pests prevalent in Kootenay Valley cherry orchard cover crops, and because it was considered possible that such an insecticide would provide economic control against leafhopper populations. Most of the leafhoppers recorded in this test work are known to spend part of their life-cycle in cover crops.

Materials and Methods

Three plots were used, each consisting of a block of 24 sweet cherry trees, almost all of the Lambert variety, 10 to 16 years old. Each plot was bordered by a buffer row of trees on all sides. The two treated plots were in one orchard and the check plot was in another. The two orchards immediately adjoined each other and were separated by a fence somewhat overgrown with native shrubs including *Symphoricarpus* sp., *Ribes* sp., *Crataegus* sp., and *Rosa* sp. The check plot, which simulated conditions in many Kootenay Valley cherry orchards, was not irrigated, mowed, pruned, or sprayed for eight years, including the year of the experiment; the ground cover was tall couch grass. The check trees were vigorous but growth was not so succulent as that in the treated plots.

The sprays were applied by a high volume sprayer. Fogging in the tree canopy applications held spray runoff to a minimum. The ground sprays of 20 per cent emulsible dieldrin[3] at the rate of 0.75 gallon per 100 gallons of water were applied on May 15 and August 12. The tree spray was 50 per cent DDT wettable powder at 3 pounds per 100 gallons with 40 per cent Sulphenone wettable powder at 2.5 pounds per 100 gallons applied on May 15 and August 12. A single spray

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[3] Hexachloro-epoxy-octahydro-dimethanonaphthalene, Shell Oil Company of Canada, Limited.

of 40 per cent nicotine sulfate at 1 pint per 100 gallons of water, a standard black cherry aphid control spray used by Kootenay cherry growers, was applied to tree canopies of both sprayed plots on June 27.

The leafhoppers were sampled by hanging plywood sticky boards, measuring 6 x 12 inches, in the cherry trees. Each board was sprayed on one side with "Deadline" tanglefoot, a material which remained sticky in any weather (2) and was capable of holding large insects. The boards were hung at random with wire hooks up to a height that could be reached conveniently from the ground, on trees of which the numbers were randomized each week. The boards were also numbered; odd-numbered boards were painted yellow, even ones white. Yellow or white board colors were used to determine if variations existed in leafhopper color preferences (3). Ten boards were hung for one week at a time in each of the three plots. The boards were changed each Tuesday or Wednesday for 20 weeks from May 7 to September 18, 1957.

With large numbers of insects in fairly homogenous groups it was possible to determinue the value of ground- versus tree - sprays, and population changes in the spray plots with those in the check plot.

Mean monthly temperatures at Creston (elevation 1,990 feet) were somewhat below average during 1957, except in April (+2°F.), May (+6°F.) and September (+4°F.). Precipitation was about ½ inch below normal for

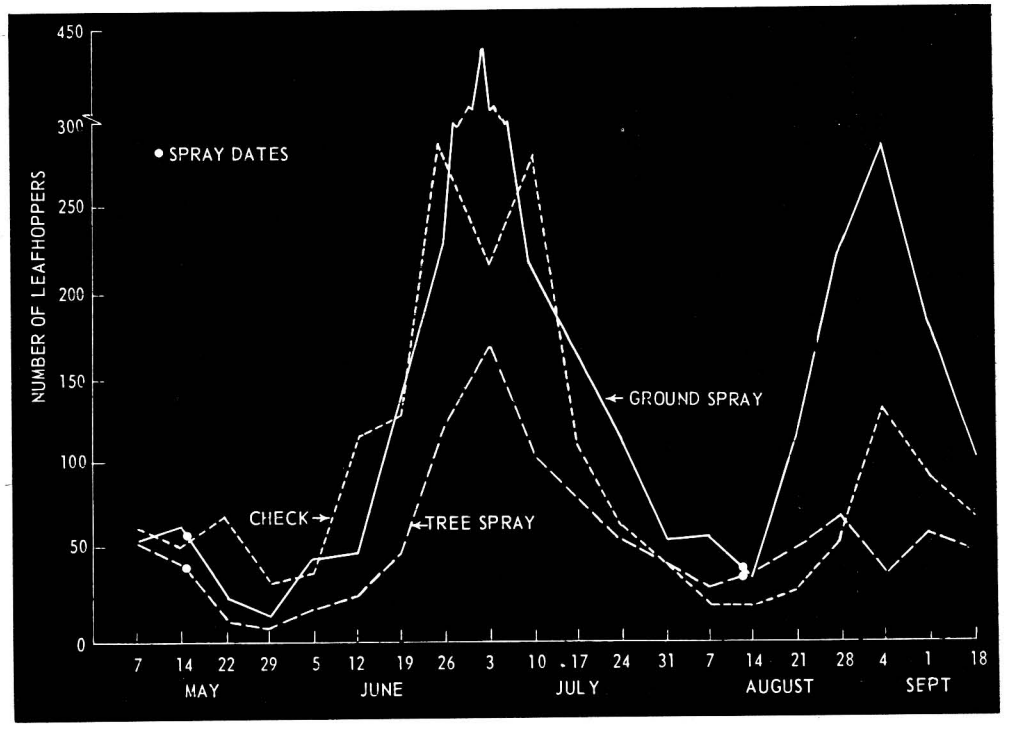

Fig. 1.—Leafhopper populations in tree spray, ground spray, and check plots in sweet cherry orchards, Creston, B.C., May to September 1957.

every month except May (— .26 inch) and June (— .03 inch). There was good snow cover in the previous winter. Killing frost in 1957 occurred September 16.

Results

The reduction of leafhopper populations by tree canopy sprays as compared to ground sprays is shown in Figure 1.

Although mesophyll - feeding leafhoppers of the genus *Edwardsiana* are unlikely to transmit little cherry virus, they were included in total leafhopper counts because they could be identified on sight, and because their high numbers showed the effects of the sprays. The residue of the foliage spray of August 12 appeared to hold down their numbers. Ground spraying had no deleterious effect on this predominantly tree- and shrub-living group. The first generation bred mostly on native shrubs growing along the fence referred to, but from early June the succeeding and overlapping generations bred on the cherry trees.

Macrosteles and *Psammotettix* were genera collected regularly. Week by week comparisons among counts of adult *Macrosteles fascifrons* show that numbers in the ground spray plot were greater than in the others. There appeared to be no migratory flights of *Macrosteles*. When the pooled numbers were plotted against time, the curve was bimodal with peaks about July 3 and September 4, suggesting two generations.

The pooled numbers of other species of leafhoppers were reduced by both programs. These species are likely to include vectors of little cherry virus.

Leafhoppers were more attracted to yellow colored sticky boards than they were to white colored sticky boards (3).

Summary

Two sprays of dieldrin, applied to ground cover only, had little effect on the numbers of leafhoppers in sweet cherry trees. By comparison, DDT-Sulphenone sprays, applied to tree canopies, gave economic control. The effects of the spray programs were assessed by comparing leafhopper counts on 10 sticky boards per plot with counts from 10 boards in the adjacent check plot. Ground sprays were tested against conventional tree canopy sprays because many leafhopper genera found in cherry orchards spend a portion of their life-cycle in orchard cover crop.

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Phyciodes mylitta Edw. on Vancouver Island

Available records make no mention of this butterfly as occurring on Vancouver Island, although records are frequent enough on the mainland of British Columbia.

I first ran across it in September, 1961, when two males were taken in separate localities in the general area of Coldstream. As **P. mylitta** is known to be double brooded and to feed on thistle in the caterpillar stage, I searched in the spring of 1962 for individuals of the first brood. After investigating many possible habitats I was at last rewarded by finding a small population of both sexes in the same district, thus establishing its existence on Vancouver Island.

It would interest me to know if anyone else has come across it. Why it has been overlooked for so long is a mystery for it is not particularly shy or retiring. It could be a recent introduction either by natural or artificial means, or with its very early and late appearance in the year and restricted habitat it could simply have eluded observation.

—*George A. Hardy, Provincial Museum (Rtd.), Victoria, B.C.*