

Spray injury was induced when Bordeaux mixture was employed subsequent to blossoming.

In a number of experiments on the control of bitter-rot (*Glomerella cingulata*) it was found that a copper spray was necessary, and that a 1½–3–50 Bordeaux in early January before any sign of appearance of the disease gave satisfactory control.

Bronze-beetle control by the use of lead arsenate in the Huapai Orchard was unsatisfactory where infestation was severe.

Excellent control of codling-moth was secured by lead arsenate, despite the fact that the check trees developed 100 per cent. infection. Applications, to be successful, must be made at proper times and with adequate equipment.

IV. *Physiological Studies : Cork Injury.*

Studies on the use of boron in relation to non-parasitic diseases of the apple have been continued by both the Plant Diseases Division and the Cawthron Institute.

Plant Diseases Division.—The study has been extended to cover the influence on storage-pit, and it has been found that boron compounds applied in various ways do not have any effect on the incidence of this disease in Cox's Orange. Studies on the permanence of soil treatments indicate that a dressing of ½ lb. per tree of either borax or boric acid may be relied on to give control of cork for a period of two years.

Cawthron Institute.—Investigations have shown that two 0.25 per cent. borax sprays—one early in November and the other three weeks later—have given efficient control of cork in both Nelson and Central Otago. So far no adverse effect on either foliage or fruit has followed the use of borax at the above strength in the usual spray combinations employed at this period.

In view of the fact that rasorite (or kernite), a hydrated sodium borate, has been suspected by some orchardists of causing damage when used in combination with other spray materials, the investigations have been extended to study the effect of borax and rasorite in an extensive list of spray combinations.

Borax used as a soil dressing round trees has been found to induce a marked increase in the susceptibility of Jonathan apples to internal breakdown in storage, 1 lb. and 3 lb. dressings being very marked in this respect. At present it is deemed desirable to restrict applications to not more than ½ lb. per tree. The matter is receiving further attention and is being extended to cover the effect of 0.10-per-cent. and 0.25-per-cent. borax sprays.

Experiments conducted in co-operation with the Department of Agriculture have shown that the use of borax is likely to have wide application in the Alexandra district, Central Otago.

Negative results have so far attended the attempt to control storage-pit and tree-pit by the use of borax compounds.

V. *Therapeutant Testing.*

The scheme for certification of therapeutants, inaugurated and controlled by the Plant Diseases Division, is now in active operation, and two certification lists have been published covering orchard sprays.

In the second list are recorded twenty-nine certified products offered by eighteen manufacturers or agents. The result has been most encouraging, and growers are freely using the service.

A further seven materials of a new type have been offered for biological testing. During the year advice regarding production of spray materials has been given to several manufacturers. Two were helped in improving the quality of their hydrated lime; three in the matter of improved oil emulsions; one in improving summer oil; one in preparation of a colloidal sulphur; two in improving lime-sulphur. Twenty-one samples of sulphur were examined on behalf of two agents.

Two hundred apple-trees of eight varieties have been planted at Mount Albert for the purpose of therapeutant testing and the improving of spray programmes. Other plantings for this work cover citrus, *Phylloxera*-resistant grapes, passion fruit, and hops.

STONE-FRUIT.

FERTILIZER EXPERIMENTS.

The Horticulture Division of the Department of Agriculture has carried out placement tests with phosphate and potash on apricots in Central Otago on exactly parallel lines to those carried out on apples, but no differences between treatments have become evident.

STANDARD COLLECTION.

The collection of standard varieties has been commenced by the Plant Diseases Division, and work this year has been concentrated on types and varieties of apricots.

SILVER-LEAF.

Two hundred peach-trees have been set out at Mount Albert for the purpose of inoculation with the infective organism, and when it is established these will be used to test out measures of control.

BROWN-ROT.

None of the programmes tested in Auckland gave economic control of brown-rot of stone-fruits. The conclusion must be drawn after four years' work that where conditions favour the onset of this disease available sprays give inadequate control.