

In order to secure further data concerning the boron status of the fruit in the principal apple districts of New Zealand, typical samples of several varieties have been obtained for boron determinations. Chemical analyses of these samples will proceed during the winter months.

So far, borax sprays or top-dressings have not given any significant results either in the control of bitter-pit or tree-pit. Further examination of fruit samples will, however, be made during the winter.

On boron-deficient soils "pitting" or "cork ailment" is not confined to apples; a sample of cherries from an Otago orchard showed on analysis only 4 p.p.m. of boron, and this low amount of boron was associated with a well-marked pitting trouble of the cherries.

Silver-leaf.—A further attempt was made to find some method of treating fruit-trees attacked by the silver-leaf fungus (*Stereum purpureum*). The experiments were rendered abortive, as the trees inoculated for test purposes failed to develop the disease.

FERTILIZER TRIALS.

CAWTHRON INSTITUTE.

Fertilizer studies of apples have been maintained at Mildura (Upper Moutere), Waimea West, and at the Annesbrook orchard.

At Mildura leaf-scorch followed by defoliation is now a serious problem on the highest-yielding block of the experiments. This block has received heavy potash treatment for a number of years, but it is not known whether leaf-scorch is caused directly by the potash treatment or whether it is associated with unidentified deficiencies of minor elements—*e.g.*, magnesium. The block receiving nitrogen only is now the poorest block on the experimental area and the fruit is lower in quality than that from the untreated block. There is increasing evidence to show that both phosphates and potash, in addition to nitrogen, are of paramount importance in maintaining crop production and high quality of fruit on the Moutere Hills type of soil.

The cool-storage trials of fruit from the Mildura blocks show that internal breakdown is more pronounced on the block receiving nitrogen treatment only. No outstanding differences in the amount of internal breakdown have been found in the case of the other fertilizer treatments on this block. The same observation applies to the incidence of Jonathan spot.

In the case of the Waimea West experiments on Cox's Orange on a poor phase of the Moutere Hills soil the experiments continue to show a pronounced advantage in yield where 3 lb. ammonium sulphate are used in conjunction with super and potash as against 1 lb. application of ammonium sulphate. Over a period of six years the amounts of significant internal breakdown have been 40 per cent. in the case of the 3 lb. application and 16 per cent. in the case of the 1 lb. application.

At the Annesbrook orchard the Dougherty fertilizer trials show that a complete manure maintains the highest yield of fruit; treatment with potash and super alone, however, on this soil has given wonderful results over a long period of years. Cool-storage trials so far have not shown any pronounced differences in keeping-quality as a result of differential fertilizer treatment.

BOTANICAL INVESTIGATIONS.

STOCKS.

(a) *Apple*.—East Malling: The trials of five East Malling stocks and Northern Spy in Auckland, Hawke's Bay, Manawatu, Nelson, Canterbury, and Otago are being continued. The varieties under test on these stocks include Cox's Orange, Delicious, Granny Smith, Jonathan, Statesman, and Sturmer.

The trees are now four years old and stock influence on the growth and general vigour of the scion varieties is becoming more evident. With the exception of Cox's Orange, all the above-mentioned varieties on Northern Spy compare unfavourably with the same varieties on the East Malling stocks. It is quite evident even at this early stage of the trials that there are among the East Malling stocks under test at least two types which will, over a wide range of soils, produce trees of far greater vigour than those on Northern Spy stock. The stock of M X II has shown a very consistent performance in this respect and should prove valuable not only for future planting where the Northern Spy is unsatisfactory, but also for the inarching of unproductive orchard trees.

Fruit from trees on the several stocks should be available in a season or two, when it will be possible to study the influence of stock on size, quality and colour.

Northern Spy: Jonathan trees budded on Northern Spy layers and root-cuttings show little difference in amount of growth at the end of two years. The deeper-rooting habit of the stocks propagated from root-cuttings does not appear, therefore, to have encouraged greater growth in the scions worked thereon than is shown in scions worked on layered stocks. This experiment is being continued.

Own-rooted Trees: Trees of the varieties Cox's Orange, Delicious, Gravenstein, Jonathan, and Sturmer, propagated on their own roots by layering, are now two years old and have become well established. The growth of these "own-rooted" trees during the two-year period is less than that shown by the same varieties on Northern Spy stock. These trees may prove of value in the study of certain physiological diseases as, being on their own roots, stock influence as a contributing factor is eliminated.

(b) *Stone-fruit*.—Two varieties of plum budded on five East Malling stocks and one cherry variety on six East Malling selections of Mazzard stock are being grown in the nursery; field trials will be established when the trees are of a suitable size.

(c) *Citrus*.—A survey of the citrus rootstock position in the Auckland District was made this summer. The leading nurseries and a large number of citrus groves were inspected and data secured