

FRUIT RESEARCH.

Advisory Committee: Mr. A. H. Cockayne (Chairman), Messrs. T. Rigg, J. Corder, H. E. Stephens, A. M. Robertson, W. Benzies, T. C. Brash, R. Paynter, A. Osborne, J. A. Campbell, F. S. Pope, Dr. G. H. Cunningham, W. M. Hamilton (Secretary).

GENERAL.

The Fruit Research programme has continued as a co-ordinated activity, the participating bodies being Plant Research Station, Cawthron Institute, Horticulture Division of the Department of Agriculture, and the Department of Scientific and Industrial Research. The Dominion Laboratory, Soil Survey Division, and the Meteorological Office have also undertaken investigations associated with fruit research.

Overseas co-operation has also been effected with the Low Temperature Research Station, the Imperial Bureau of Fruit Production, the East Malling Fruit Research Station, and with the Australian Council of Scientific and Industrial Research.

The Fruit Cold Storage Committee has continued to deal with all problems affecting the handling, storage, and transport of fruit. The Fruit Research Workers' Committee has met periodically to consider details of the investigations inaugurated and to examine the progress made in each.

The field work connected with the investigations is carried out at—(1) The research orchard, of 72 acres, at Appleby, Nelson, 20 acres of which are planted in full-bearing trees; (2) the Cawthron Institute orchards, Nelson; (3) the Tiritea area attached to the Plant Research Station, Palmerston North; (4) the Hawke's Bay Fruitgrowers' Association experimental orchard, Havelock North; and (5) in a series of selected orchards distributed through the various fruitgrowing districts of the Dominion.

The work has been greatly facilitated by the ready assistance rendered on numerous occasions by the New Zealand Fruit-export Control Board, the New Zealand Fruitgrowers' Federation, and the shipping companies operating in New Zealand waters.

1. RESEARCH ORCHARD, APPLEBY.

The whole of the planted area of the orchard is in full utilization for the conduct of manurial, spray, and cultural trials, and is available for the field studies arranged by any of the workers engaged on various researches. Very detailed records of tree growth, yield, leafage, blossom, &c., are regularly made so that the closest watch may be maintained upon any changes which appear. All the trial areas have been arranged in accordance with the best methods of experimental layout, and are designed to reduce experimental error to a minimum.

Owing to heavy incidence of black spot and eye-rot, the early promise of a heavy crop for export was not fulfilled, only 6,826 cases being available for shipment. This is, however, markedly heavier than the export of 3,134 cases for the 1935 season, which was the year of light crops, but falls far short of the record shipment of 10,333 cases in 1934. It is proposed that the problem of biennial bearing should now be made the subject of research because of the importance it has in regard to marketing and also wastage and deterioration in fruit quality during the "off" years.

Because excessive rainfall experienced during October and November made effective spraying difficult, black spot was more prevalent than has been the case during the past five years. Notwithstanding additional applications of spray, the infection continued to increase throughout the season, and, particularly in the case of Dunn's, Sturmers, and Delicious, resulted in the loss of much fruit. Eye-rot (*Botrytis*) was fairly prevalent in Jonathans and to a lesser extent in Cox's and Delicious, and was responsible for the rejection of much fruit when grading for export. Leaf-roller caterpillar was prevalent in Jonathan and Sturmers, particularly in heavily-laden and dense trees and in the test areas on which the fruit was all retained unthinned for recording purposes. Cox's, Delicious, and Jonathan varieties, in common with other orchards in the district, suffered to some extent from russetting. Woolly aphis was fairly prevalent, particularly on Cox's and Dunn's, but during February and March *Aphelinis mali* multiplied considerably and exerted a restraining influence on the pest.

Owing to the large amount of unexportable fruit depressing prices to unpayable levels on the Dominion markets, a considerable quantity of reject fruit was donated to charitable institutions and the mental hospital.

Manurial Experiments.

The outstanding feature of the 1935 season's results has been the yield increases that have followed the application of so-called "complete" fertilizer mixtures in the case of the main Sturmer block. The block receiving a "complete" dressing of phosphate, potash, and nitrogen showed a highly significant increase in yield of 77 per cent. over the unmanured plot, while the plots receiving phosphate and nitrogen in combination have also shown significant crop increases. These trees have also maintained a healthy and vigorous growth, while those on the unmanured plots or those receiving phosphate alone are falling off in condition. The trees receiving nitrogen alone are intermediate in condition.

In both Cox's and Delicious the plots that are in receipt of nitrogen have shown considerable crop increases, but on account of the variability of the trees they have not yet passed the limits of experimental error.

The heavy potash treatment has not affected the colouring of any of the varieties, but appears to have increased the size of the individual fruits in both Jonathan and Sturmer. Any effect that there may have been in Cox's was masked by the differences existent in crops of individual trees on the various plots.