

## RAILWAY TRIALS.

One of the staff (Mr. W. G. Hughson) has assisted in extensive railway trials throughout the year. Tests were conducted on the Auckland-Frankton and on the Thorndon-Paekakariki sections in a full investigation of the possibility of eliminating sparking from Waikato coals with the aid of the Langer combustion-control apparatus. Later in the year tests were conducted on the Christchurch-Springfield section both with and without the Langer combustion-control apparatus, and burning a wide variety in screen sizes of the following coals: Dobson, Wallsend, Goldlight, Liverpool, Paparoa, Tyneside, Blackball, Westport Main, Millerton, Briandale, Brunner, and Flower Creek (Reefton). The trials resulted in the accumulation of much valuable information, and have shown to what extent the use of run-of-mine coals can be increased. All data is incorporated in confidential reports to the Railways Department. The trials have also entailed an amount of laboratory work in analysing samples of the various coals used.

## FRUIT COLD STORAGE RESEARCH:

Advisory Committee: Messrs. J. A. Campbell (Chairman), R. Sutherland, W. Benzie, F. W. Grainger, L. W. Tiller, A. M. Robertson, Captain W. Olphert, Dr. M. A. F. Barnett, and F. R. Callaghan.

Fruit cold-storage investigations are carried out as a joint activity of the Horticultural Division and the Cawthron Institute.

At the Cawthron Institute the investigations involve trials of manurial treatments on the storage quality of Jonathans and Sturmer apples; on the effect of light and heavy dressings of nitrogenous manures on Cox's Orange and Sturmers; on the influence of locality on the storage quality of Jonathan and Sturmer apples; and the effect of rootstocks on the storage of Cox's Orange Pippin, Jonathan, and Sturmer apples. These experiments, which have been conducted in land stores at Nelson, have proved the previous findings that a complete manurial treatment greatly assists in reducing wastage losses, while the response to nitrogenous manures has been shown to depend to some extent, at least, on varieties. While Statesman and Cox's apples show increased wastage as the result of both light and heavy dressing of nitrogenous fertilizers, Delicious show no adverse effect whatsoever.

During the year, in collaboration with the Cambridge Low Temperature Research Association, an extensive set of fruit cold-storage investigations was devised and carried out with the assistance of officers of the Horticultural Division. The experiments involved trials as to the effect of soil-types, maturity, handling, wrapping, and packing upon wastage in fruit sent overseas. Some two hundred experimental cases of fruit were sent forward for detailed examination in London, and a similar number representative of each trial were retained for inspection in New Zealand. In addition, one small trial shipment of passion-fruit was despatched, and the report received on this indicated that it was quite possible to transport this fruit successfully under ordinary ship's cool-storage conditions, while further attention to a few details was necessary in order to land passion-fruit in a form attractive to the British consumer. It is proposed to continue this work for a further season.

## FRUIT RESEARCH.

Advisory Committee: Messrs. H. Vickerman (Chairman), F. Firth, A. M. Robertson, F. S. Pope, Thos. Waugh, H. E. Napier, Wm. Benzie, T. C. Brash, W. J. Rodger, A. H. Cockayne, J. A. Campbell, T. H. Easterfield, T. Rigg, and G. Shirtcliffe.

The fruit-research programme is being carried out through the co-ordinated activities of the Plant Research Station, Cawthron Institute, and the Horticultural Division of the Department of Agriculture.

Periodical meetings of investigators are held, when progress reports are reviewed and the whole programme of work discussed.

The field research work is conducted at the experimental orchard at Appleby, Nelson, an area of some 72 acres acquired specially for the purpose, and in a number of private orchards selected throughout the main fruitgrowing districts of New Zealand. At present the nursery-work is being conducted at the Plant Research Station, Palmerston North.

## RESEARCH ORCHARD.

In order to acquire detailed knowledge of the trees proposed to be used for manurial trials individual tree yields have been recorded for two seasons, and on this information a series of trials has been planned in detail. Portions of the orchard have been used for spraying trials, insect and fungus investigations. The yield from the orchard during the past season was particularly good, some eight thousand cases being made available for export purposes. An outbreak of eye-rot disease, following heavy rain in December, was responsible for the loss of some three thousand cases. The fruit from the orchard was also called upon for the cold-storage research work conducted at the Cawthron Institute and by the Horticultural Division.

During the year increased office, storage, and living accommodation has been erected at the orchard, while improvements have been made to the spraying outfit and to the water-supply. A further area has been cleared and ploughed in preparation for the planting of experimental trees from the Nursery.