

INSECT PESTS.

Attention has been devoted specially to codlin-moth, leaf-roller caterpillar, and red mite. The life-histories of all these insects under New Zealand conditions is being worked out carefully as an assistance to any control measures to be devised. It has been ascertained that only one brood of codlin-moth occurs in New Zealand each year in most fruit districts and that red-mite eggs appear to be of two distinct types, one of which has proved highly resistant to spray treatment.

FUNGUS PESTS.

Black spot of pip-fruits has been studied during the year and the times of ascospore discharges in different districts ascertained with a view to suggesting a more effective method of control.

Investigations into fungus diseases causing wastage during cold storage has been continued, it being found particularly necessary to secure accurate identification of these rots before proceeding with detailed tests designed to devise methods of control.

SPRAY MATERIALS.

Work has proceeded on the chemical composition of orchard sprays with a view to determining wherein their efficiency lay. Two very important practical results have emerged from the investigations. Firstly, the efficiency of a sulphur spray has been shown to depend entirely upon the fineness of the sulphur-grains themselves, and consequently colloidal sulphur excelled other forms in its effectiveness. Secondly, the virtue of lime-sulphur was shown to be estimated by its polysulphide content, and not by its relative density, as previously was the rule. Attention to polysulphide content will in future enable both russetting to be avoided and applications of this spray to be really effective.

Field-work in connection with sprays has involved tests of modifications of the Bordeaux formula and the use of this and other mixtures in the control of peach leaf-curl and bud-drop of peaches.

Tests have also been carried out with different summer and winter oil sprays for the purpose mainly of securing more adequate control of red mite.

MANURIAL EXPERIMENTS.

Following on the records kept of individual tree yields at the Research Orchard for the past two seasons, and which have been subjected to close statistical analyses, blocks of experimental trees have now been selected for both permanent and temporary manurial trials designed to show the effect of both a full range of individual manures and combinations of manures upon tree-growth, fruit-yield, and fruit quality.

Observational manurial trials have been continued in some fifty-seven orchards throughout the different districts of New Zealand, using a full range of manures. In all instances, except in trees growing on rich soils, the additions of nitrogenous manures in promoting growth have been apparent. In the Canterbury and Hawke's Bay trials it would appear that applications of lime exert a beneficial effect upon fruit-colour.

ROOTSTOCK INVESTIGATIONS.

As the result of collection of rootstocks from most of the New Zealand nurseries, it would now appear that some nine types of Northern Spy may be isolated. This work is now being followed up by propagating varieties of each of these stocks with a view to ascertaining their influence on tree-growth, fruit-yield, &c. Contemporaneously further rootstocks will be secured from established orchards where the conditions of growth, yield, &c., which they have already produced can now be measured.

Trials are still proceeding with the East Maling stocks in order to ascertain such strains as may be suitable for New Zealand conditions.

LEATHER RESEARCH.

Advisory Committee: Messrs. J. E. Astley, A. E. Lawry, D. Phillips, and W. Donovan. Research Chemist: Mr. P. White.

There are two things necessary before an article can be sold satisfactorily. The first of these is that the quality of the material must be good, and the second is that the price must be right. The aims of the Research Association have been to keep these two essentials to the forefront. In past reports references have been made to practical and laboratory wear tests, water-absorption tests, and analyses of New Zealand sole-leather. The results of these tests have been applied to factory processes, with the elimination or modification of those tending to reduce the wearing-values of the sole-leather produced.

The methods of manufacture have been carefully considered with a view to the elimination of waste in materials, time, labour, and power as far as possible. In this way the cost of production has been lowered without reducing in any way the quality of the finished article.

The New Zealand tanners have been able to supply the requirements of the Dominion with leather of the desired quality and at a reasonable price. If this had not been possible the cost of leather would have advanced appreciably, following the rate of exchange, which makes imported leathers dearer.