

In co-operation with the State Forest Service, the introduction of the *Ibalia* egg parasite of *Sirex* is being attempted.

Analysis of Food of Birds.—In connection with the survey of the food of certain birds being carried out by the Animal Ecology Section, examination has been made of the stomach contents of sixty-seven birds from the agricultural areas of the Auckland Province. Amongst this material several species of insects not previously recorded in New Zealand have been found. A report on the investigation has been drawn up.

Collections.—The insect collections have been overhauled and considerably expanded, necessitating more accommodation for the specimens. This involves sorting, setting, and card indexing of material in order to place the records on a proper basis. Collections and manuscripts of the late Mr. A. L. Tonnoir and Mr. A. F. Clark have been dealt with.

Library.—The routine duties associated with the maintenance of the entomological library and the handling of new accessions has been carried out, together with the extensive task of checking, in readiness for publication, all of the 3,000 references in the manuscript of the "Bibliography of New Zealand Entomology."

FRUIT RESEARCH

Magnesium Deficiency of Apples.—The experimental plots show that Cox's Orange and Sturmer trees at Tasman continue to give satisfactory response from the use of ground dolomite, but at Braeburn, possibly because of the abnormally dry summer, the use of magnesium compounds has not entirely overcome leaf-blotch and the early fall of apple-leaves on the Sturmer variety.

Zinc Deficiency Tests.—To obtain information on the value of zinc sprays for typical orchards on the Moutere Hills soil, experimental plots have been established in five orchards at Tasman and Mariri. Dormant zinc sulphate sprays at 5 per cent. and $2\frac{1}{2}$ per cent. were used on Gravenstein, Sturmer, and Jonathan varieties of apples, but with no noticeable benefit. Analyses of apple-leaves collected in different orchards show no evidence of wide-spread zinc deficiency.

With certain cherry-trees affected with "die-back" in a Tasman orchard, the effect of zinc sprays on the zinc content of the leaves was quite marked. The trees appeared to benefit considerably, but further work is required to ascertain whether other minor element deficiencies are connected with "die-back" in cherries and other stone-fruits on Moutere soils.

Copper Deficiency in Apple-trees.—Experimental plots in an orchard at Harakeke, where the Jonathan trees not only set fruit very poorly but have a weak foliage development, showed copper deficiency to be a very important factor. A Bordeaux spray applied in the spring resulted in very marked improvement not only in foliage, but also in set of fruit. Experiments are to be continued next season to secure more information.

Raspberry "Die-back."—"Die-back" was very prevalent in many raspberry-gardens, and since the possibility of boron deficiency occurring on raspberry soils had been suspected by the Institute two years previously, experimental plots with boron and other minor elements had been established in the Motupiko and Tadmire district. In the first season no pronounced benefit resulted, but this season the boron plots were outstanding in development of fruiting spurs and foliage, in striking contrast to the poor growth on non-boron-treated plots.

Further treatments with borax at the rate of $\frac{1}{2}$ oz. per raspberry-bush have been made in several gardens to secure confirmation of these beneficial effects. Leaf samples from treated and untreated raspberry-bushes have been obtained and will be examined for boron content at an early date.

Raspberry Manurial Trials.—These comprise tests, in two gardens, with fertilizer mixtures with and without potash to ascertain the value of potassic manures. Supplementary tests with boron, magnesium, manganese, zinc, and copper are being conducted