

on nursery technique applies to citrus stocks and on their general performance on typical soils in the vicinity of Auckland. This investigation was carried out as a necessary preliminary to the proposed citrus research at Mount Albert.

VARIETIES.

(a) *Apples*.—Strains of Delicious, Cox's Orange, Jonathan, Sturmer, and Granny Smith are being tested. These include red types of the first three varieties. Special attention is being directed to strains of Delicious, with a view to discovering a type with a closed calycine sinus. Unfortunately for this work the hurricane experienced in Palmerston North last year destroyed the crop then carried and also the prospects of a following crop, owing to complete defoliation of the trees. The little fruit that has been obtained of a few Delicious strains indicates, however, that these show considerable variation in the formation of the calycine sinus, ranging from a wide passage to one almost closed. Fruit of all the strains should be available very soon under the more favourable climatic conditions obtaining in Auckland.

(b) *Citrus*.—A study of citrus varieties and strains in the vicinity of Auckland was commenced this summer, and will be continued as opportunity offers. Many lemon groves showed a large percentage of "off-type" trees. Special attention was paid to sweet orange varieties and trees that were found to be doing well have been marked as a future source of budwood.

ENTOMOLOGY.

CAWTHRON INSTITUTE.

Aphelinus mali.—Owing to the fact that *Aphelinus mali* does not in some seasons and districts maintain an efficient control over woolly aphis, a study has been undertaken to ascertain the factors that influence the late emergence of the parasite in the spring.

From August to October inclusive a series of experiments was undertaken upon the influence of temperature on overwintering *Aphelinus*. It was found, when kept at a constant temperature of between 60° and 79° F., that the adults will emerge as much as five weeks ahead of those subjected to normal conditions; also the higher the temperature between 60° and 79° the earlier the emergence. Under glass out-of-doors and subjected to natural temperatures, which varied 50° between day and night, the emergence was very low indeed. It was shown also that there is a considerable mortality, especially amongst pupæ under abnormally high temperatures.

In regard to the influence of sprays the evidence so far secured is not conclusive and demands a larger-scale programme. It would appear that the pupæ are much more sensitive to sprays than the larvæ. But it is true that the greatest mortality occurs amongst the pupæ even under untreated conditions.

Apple Leaf-hopper.—The work of establishing a dryinid parasite against the insect has been continued, though a detailed search involving the dissection of a large number of leaf-hoppers failed to reveal the presence of parasites where they had been liberated in the field last season. A further consignment of these dryinids was received from North America and the attempt at establishment proceeded with.

Citrus Red Scale.—A consignment of the *Lindorus* ladybird beetle was successfully imported from California and liberated near Auckland.

Raspberry Bud-moth.—A considerable amount of valuable data is being secured on the biology of this insect.

For Entomological Investigations conducted by the Entomology Division, see page 26.

FRUIT COLD-STORAGE RESEARCH.

Advisory Committee.—Messrs. J. A. Campbell (Chairman), H. G. Apsey, W. Benzies, F. R. Callaghan, J. T. Cross, W. K. Dallas, F. W. Grainger, J. L. Mandeno, T. Rigg, A. M. Robertson, H. E. Stephens, R. Sutherland, L. W. Tiller (absent in England), W. M. Hamilton (Secretary; now in England), and H. C. Heays (Acting-Secretary).

As in previous years, research on fruit during the storage and oversea-transport periods has been conducted by the Fruit Cold Storage Committee in co-operation with, and materially assisted locally by, the New Zealand Fruitgrowers' Federation, the New Zealand Fruit-export Control Board, the New Zealand Dairy-produce Board, the Horticulture Division of the Department of Agriculture, the Wellington Harbour Board, and the managing directors of certain local commercial cool stores. Equally valuable help from abroad has come from the Cambridge Low Temperature Research Station, the Scientific Liaison Officer in London, and the oversea shipping companies, while the keen interest and practical co-operation of the officers and engineers aboard the respective vessels have been invaluable.

Mr. L. W. Tiller, of the Research Orchard, Appleby, travelled to England on the s.s. "Port Nicholson" in charge of experimental consignments of fruit, and remained in England to study the production, handling, and marketing of fruit, in order to supplement his already extensive knowledge of these matters under New Zealand conditions.

VISIT OF DR. A. J. M. SMITH.

At the invitation of the New Zealand Government, Dr. A. J. M. Smith, of the Cambridge Low Temperature Research Station, who was undertaking an important official trip to Australia, spent about a month in New Zealand. During this time Dr. Smith visited selected dairy and cheese factories, meat-works, cool stores, orchards, and research institutions, and, in discussions with research workers and others interested in the Dominion's meat, dairy, and fruit industries, freely made available his wide experience and specialized knowledge of the transport and storage of foodstuffs.