Diamond-back Moth.—A considerable amount of work in regard to this pest is being carried out both here and in England. From a report on a preliminary survey in connection with the moth and its parasites it is pointed out that the moth is known in England mainly in epidemic form; frequently it is not noticed and recorded by economic entomologists. A number of parasites have already been found in England, but a considerable amount of work remains to be done before any material can be sent out here.

In New Zealand a considerable amount of time has been devoted to field surveys, life-history studies, and the existing host-parasite relationship. A detailed account of this work as far as it has progressed will shortly be available.

White Fly.—Stocks of the white-fly parasite (*Encarsia formosa*) have been kept going throughout the year, and supplies of the parasite have been sent out to various applicants from time to time. This parasite when given time to establish proves a thoroughly effective check to the white fly.

Red Mite.—Further experiments were carried out much on the same lines as those already reported in the *Journal of Science and Technology*, Vol. 16, No. 5, pp. 261–270 (1935). The purpose of the work was to ascertain as accurately as possible the value of applying winter oils against the overwintering eggs of the red mite (*Paratetranychus pilosus*) as a control for this pest. The technique of counting and observing results was the same as that used in the experiments already reported in the publication mentioned above. Infested apple and peach twigs were used, and these were sprayed in batches as required, and immediately after spraying the twigs were confined outside in wire-netting covered cages exposed to the weather from all angles. Sprayings were carried out from the 22nd July, 1935 to 17th September, 1935, and the twigs were then left in the outside cages until November, when kills secured were counted. The aim of this method was to combine normal orchard conditions with accuracy in egg counts. The oils used were straight oils with viscosities varying from 95 to 399 sec. Redwood at 100° F. These oils were used in emulsions of varying stabilities so that both the effect of viscosity and stability of emulsion could be studied. Approximately one thousand eggs were used in each experiment, the total number of eggs counted in the whole work being well over ninety thousand. The results indicate that under the outdoor conditions neither increasing viscosity or stability of emulsion have any significant increased killing effect. The oils applied in July and early August, had no killing effect at all, whereas those applied in late August and September gave only about 40 per cent. kill due to oil, taking into consideration the percentage of natural mortality which was high, being in 75 per cent. of the trials approximately 40 per cent. The weather during the period for which the twigs were exposed in the outdoor cage was abnormally wet and conditions were generally unfavourable to a good control by the oil. From experience in this work it would seem that when the eggs are exposed to outdoor conditions in this way that the method of estimating results described in experiments already reported in the *Journal of Science and Technology* (above) might be investigated with advantage. If suitable supplies of eggs can be secured it is proposed to carry out such an investigation this winter, as this is necessary to interpret the results correctly.

In conjunction with the above detailed work a fairly large field experiment was carried out on Delicious apple trees in a Hastings orchard. Altogether 204 trees were included in the experiment, which was designed to test the effect of viscosity and stability of emulsion on the killing power of winter oils on red mite eggs (*P. pilosus*). The oils were applied in early July on one block, and in early September on a second block. The purpose of this was to discover also whether the time of application influenced the kill secured. In July and September overwintering eggs of *P. pilosus* were very plentiful on most of the trees, but at an inspection in the middle of December mites were extremely scarce on all trees, even on the checks, so that it was impossible to detect any difference between the effects of any of the oils. The season had been an extremely wet one, and apparently this accounted for the disappearance of the mites.

Up to the present there seems to be little evidence to show that winter oils against *P. pilosus* give a good kill.

Insecticides for Controlling the White Butterfly (P. rapae) on Cabbages.—This work was continued at the Area in the 1935–36 season. The insecticides tested were arsenate of lead sprays and dusts, calcium arsenate sprays and dusts, pyrethrum sprays, nicotine sprays, common salt sprays, lettuce decoction sprays, and derris sprays and dusts. The results show the superiority of the derris dusts.

The poison residue problem is also being investigated thoroughly. This is of moment where arsenicals are used. Cabbages were sprayed at various times with lead arsenate and harvested at specified intervals after spraying. The samples have been forwarded to the Dominion Analyst for examination. Results so far show that even if an interval of six weeks is allowed between the last spraying and the time of harvesting, there is a danger of more than 0·01 grain of arsenic trioxide per pound being present if the whole cabbage is analysed. On the other hand, if only the hearts of such cabbages are used there is little more than a trace of arsenic present. The figure 0·01 grain of arsenic trioxide per pound of foodstuff was that adopted by the Royal Commission on Arsenical Poisoning in London, 1903. This figure is accepted in most countries, but in New Zealand the regulations under the Sale of Food and Drugs Act, 1908, do not allow the presence of any arsenic or lead at all on fresh cabbages and cauliflowers. The whole position is unsatisfactory as far as recommendations for the use of arsenicals are concerned, especially since lead arsenate spray will give quite a good control of white-butterfly larvae. Therefore, the present work is designed to clear up the position. This project should be finished after next season.

Red Scale (Chrysomphalus aurantii).—In collaboration with the Horticulture Division, an experiment on the control of red scale on lemons was carried out at Tauranga. The object of the work was to discover the nature of the control secured with summer oil at 1–33 on this pest. The 1934–35 season was a bad one for this scale, and growers claimed that it was very difficult to secure a control by oil-spraying. The plots at Tauranga were sprayed at specified intervals and a week to ten days after spraying samples of the sprayed fruit were forwarded to Palmerston North for examination as to kill. Examinations showed that more adult scales remained alive after spraying than did any younger stage. Particular care was taken to secure a complete spray cover on specimens forwarded, but even so the kill of mature scales varied from 50 per cent. to over 90 per cent. Two consecutive sprayings, on the whole, gave very good control. The results show how important it is to spray thoroughly because a great number of growers cannot afford to put on more than one spray during the season.

Publications.

Papers published during the period 31st March, 1935, to 31st March, 1936, were as follows:—

(1) Red Mite Control by Oil Sprays, *Journal of Science and Technology*, Vol. 16, No. 5.
(2) Six papers on Economic Aphides and their Control, *New Zealand Journal of Agriculture*.
(3) Eelworm Disease of Chrysanthemum, *New Zealand Journal of Agriculture*.
(4) The Use of Insecticides in the Control of the White Butterfly, *New Zealand Journal of Agriculture*.
(5) Experiments on the Control of the Bronze Beetle, *New Zealand Journal of Science and Technology*.
(6) The White Butterfly Menace: Efficient control by the pupal parasite *Pteromalus puparum*, *New Zealand Journal of Agriculture*.
(7) Thrips: With Special Reference to the Greenhouse Thrips, *New Zealand Journal of Agriculture*.
(8) The Potato-Tuber Moth, *New Zealand Journal of Agriculture*.