

CAMOUFLAGE

Advice on botanical aspects was given to the Army authorities. Experiments on fire-proofing manuka and other material yielded a method that gave very satisfactory results.

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DIAMOND-BACK MOTTH (PLUTELLA MACULIPENNIS)

Completion of field surveys of cruciferous crops throughout the Manawatu, Rangitikei, Hawke's Bay, and Masterton areas in the North Island, and Marlborough, Kaikoura, North and South Canterbury, and as far south as the Taieri Plains in the South Island, show that, over the whole of the area covered, both species of parasites (*Angitia cerophaga* and *Diadromus collaris*) are well established and for the most part are exercising a very good control over the diamond-back moth.

Details of the survey have yet to be completed, but it can be said that the degree of control attained in the North Island has this year, at any rate, reached a high peak of efficiency. The survey in the South Island, however, while a good control of the moth is revealed, shows that the same degree of success has not yet been reached as in the North. The explanation of this difference at the present time is perhaps the fact that the parasite liberations commenced two years earlier in the North than they did in the South Island. With our present knowledge of the position, however, there does not appear to be any reason why control should not eventually reach the same degree of perfection in both Islands. This feature will be elucidated by the future annual surveys.

The above facts are in relation to farmers' crops and do not refer to the home garden, where cruciferous crops grown for home consumption require a greater degree of protection from insect attack, and where insecticides must be used.

Consignments of *Diadromus collaris* have been sent to the Government Entomologist at Suva for use against the diamond-back moth in Fiji.

COCKSFOOT STEM-BORER (GLYPHIPTERYX ACHYLOESSA)

Considerable progress has been made with the researches into the biology of this insect, the larvae of which extensively infest the stems of cocksfoot in the seed producing areas and elsewhere in New Zealand. As far as can be ascertained, the insect is a native species. Apart from cocksfoot, other hosts include four species of native grasses (two of which are the hard and silver tussocks), nine introduced grasses, and, to a small extent, wheat.

The infestation of a cocksfoot crop varies according to the locality in which it is grown and the age of the area. In Ashburton and Banks Peninsula very high infestations are found in the old areas, showing a percentage of 50 to over 70. In Rangiora, where the areas are more scattered and younger, the maximum infestation was 37 per cent., whereas in Timaru the highest infestation found in a sampled field was 16 per cent. On the whole young stands were found to be more lightly infested in comparison with the older ones. In Eiffelton a young paddock was sampled in 1943 and again, using the same method, in 1944, when the infestation was found to have increased from 12 per cent. to 29 per cent. A twelve-year-old area was also sampled and the infestation in 1943 was 86 per cent., while in 1944 it had dropped to 62 per cent. This drop in the older paddock may have been due to variation in climatic conditions at the time that the moth was active.

The moths are on the wing during September and until November, and place their eggs on the blades of cocksfoot near the base of the plants. The incubation period is from nineteen to twenty-two days. Though some of the young larvae enter directly into the cocksfoot stems, most of them first burrow in the supporting tissues, thus cutting the majority of the scattered vascular bundles. This encirclement of the stems is the cause of injury to the seed-head, the heads of damaged stems often assuming a whitish appearance.

After encirclement is complete, the larvae enter the hollow interior, where the remainder of the cycle is completed. At first most of the larvae migrate upwards, and then descend when the cocksfoot ripens. During autumn, 75 per cent. of the larvae were found below the crown in the underground tiller of the plants. Later, in winter and early spring, they again ascend, and pupation commences during July.

Experiments are being carried out with the object of ascertaining whether any measure of control can be secured by cutting the stubble at varying heights at different times of the year. Inquiries overseas have failed to secure any data on parasites that might be of use against the cocksfoot stem-borer.

CHEESE-MITES RESEARCH

The survey of cheese-mites in cheese-factories has brought to light additional information. It has been found that the constitution of mite colonies differs specifically in different factories. As the species differ in their physical reactions, information is being sought on the factors determining the incidence of each species. These observations are being carried out both in the factory and laboratory. The morphological taxonomic characters of all stages of each species have been studied, together with the duration of development of each stage of each species. These data are fundamental in the application of control measures.

The control of cheese-mites and the protection of cheese against them has been investigated. In this the influence of waxes, dusts, and fumigants has been studied. The experiments with waxes and dusts have shown that a measure of control and protection can be secured. In regard to fumigants, these have given promising results under some conditions.

The fumigants experimented with were ammonia, carbon dioxide, methyl bromide, and dichloroethyl ether. The first two proved unsuitable. Methyl bromide was found to be effective, but has certain disadvantages, and in searching for other substances it was decided to try dichloroethyl ether.