

(4) LUCERNE-FLEA.

The lucerne-flea position has been kept under observation during the year. Several visits were made to the area of subterranean clover which is infested at Maraekakaho. The flea population was considerably reduced in comparison with the previous year and little damage was evident.

The reduction in population in 1939 had been expected owing to the prolonged dry period in summer and autumn, which delays the hatching of the eggs, and the low winter temperatures, which retard the rate of growth of the insect. In this area the predaceous mite, *Biscurus lapidarius*, is not present, and an attempt which was made to obtain supplies from Australia was unsuccessful.

There has been only one report of lucerne-flea damage during the year. In this instance the damage was done to lucerne at Takapau. Not all of the crop was infested, but in the part which was infested the damage was moderately severe. Damage of such severity to lucerne has not been encountered previously in New Zealand. The severity of the damage indicates that there must have been a high population of lucerne-flea in winter and spring, and it is difficult to reconcile this with the position at Maraekakaho, where the population was low. A point of some importance is that the predaceous mite, *Biscurus lapidarius*, was present in this lucerne area and, in fact, was more abundant there than in any of the other localities in which it had previously been recorded. It may be possible to use this area as a collecting ground for the mite if it is necessary to disseminate it artificially.

The opinion is still held that the lucerne-flea in localities such as Hawke's Bay, which are favourable to it, is likely to do quite serious damage to both subterranean clover and lucerne in particular seasons when weather conditions are especially favourable to it.

(5) CHEESE-MITES.

Preliminary work in connection with the control of cheese-mites has been undertaken in anticipation of the control of mites under abnormal conditions likely to be occasioned by the stoppage of transport of our primary products. The investigations to date have revealed that some measure of control may be secured by the use of ammonia and paraffin oil.

Ammonia, on account of its lethal effect on the mites, must be seriously considered for the control of the mites in cheese storage, but further experiments would be necessary with this material to determine methods of application.

Paraffin oil merits consideration because of its mechanical effect on the mites, and if under storage conditions it would act in the same way as it does under experimental conditions it would probably be an effective controllant.

(6) TIMBER INSECTS.

Research activities in regard to insects attacking constructional timbers have been developed during the year, under the direction of the Timber Protection Research Committee.

For the most part attention has been given to the termites, or "white-ants," which have recently come to the fore as of major importance in certain parts of the Dominion. Among these termites are both the Australian earth-dwelling forms and the New Zealand "dry-wood" forms; the former require to be in contact with the ground, but the latter do not. It has been found that the Australian species, *Coptotermes acinaciformis*, is well established, and outstandingly destructive. This species is known in Australia as "termite enemy No. 1" in so far as constructional timbers are concerned. In New Zealand all the commonly used timbers, including rimu, totara, matai, and kauri, are attacked. This species also attacks trees, and there are indications that our native forests may be subject to attack, as the insect has been found already well established in such species as puriri and pohutukawa. In regard to exotic trees, the insect has become established in oak and poplar, and eucalypts are doubtless within the range of infestation. It is unlikely, however, that species of *Pinus* will be attacked to any great extent. Control measures have been inaugurated, and a publication on the subject of termites has been issued and may be secured from the Cawthron Institute.

In regard to other timber-infesting insects, attention is being given mainly to the native two-toothed longhorn beetle (*Ambeodontus tristis*), which is also of major importance.

In checking the spread of timber insects, a universal practice to be condemned is the marketing of timber from infested buildings that have been demolished. This spreads both termites and wood-borers to uninfested areas, and the suppression of the practice is a very urgent need in New Zealand. All infested timber should be burned.

(7) TUSOCK-MOTH.

A study of these insects showed that their caterpillars were not the primary cause of deterioration of tussock country.

(8) ROUTINE.

Apart from the major research activities, considerable attention has been given to giving advice to farmers and horticulturists, to public lectures, to the preparation of publications, to quarantine problems, and to the identification of insects and the keeping of records regarding their activity. Assistance has been received from and given to the Department of Agriculture.