

the country fireblight has been repeatedly isolated and constantly kept under observation in cultures in the Laboratory. It has been isolated from medlar (*Pyrus germanica* L.), grown in culture, and inoculated into this host, where it formed characteristic fireblight lesions, recovered in culture, and inoculated into pear and hawthorn, again producing fireblight lesions. Mr. R. Waters, who has carried out the whole of the cultural work relating to this organism, has evolved a cultural method of diagnosing fireblight which is rapid and certain. It is based on the appearance in forty-eight-hour colonies of internal radiate characters, a feature hitherto undescribed in the literature on the subject. Numerous laboratory experiments have been carried out with a view to determining the lethal effect of various chemical substances, organic and inorganic, on this organism. Chemicals that have in the laboratory shown marked lethal effects have in varying quantities been injected into trees infected with fireblight, with the object of ascertaining whether they will have any effect as a contollant of this disease. So far results have not been encouraging. Several articles on fireblight by various members of the staff have appeared from time to time in the *Journal* and other publications.

Powdery Scab of Potato.—This disease, known as *Spongospora subterranea*, has been present for many years in New Zealand, but it is only of very minor consequence in potato-growing, and has not called for any adoption of control measures. Its presence in New Zealand is now, however, of considerable significance, as the Australian Commonwealth has prohibited the importation of New Zealand potatoes into Australia owing to the disease being in the Dominion. Efforts to lift this embargo were unavailing, and a commission of which the writer was a member visited Australia and placed the facts before the Australian authorities. They, however, remained firm in their determination to exclude potatoes from New Zealand, but finally decided to send over a potato expert to examine the main potato areas of the Dominion. He, however, reported against the lifting of the embargo, and there the matter stands. It would not be really a very difficult matter to eradicate powdery scab from New Zealand were disease-free seed alone used and planted on disease-free land. It is, however, very difficult to persuade farmers to adopt these methods, owing to the fact that the presence of the disease in New Zealand affects neither the quality or quantity of the crop. There is reason to think that the Australian authorities will later recognize the non-economic importance and easily controllable nature of powdery scab, and then the embargo may be lifted.

ENTOMOLOGY.

Routine correspondence in connection with insects and insect diseases sent in for diagnosis occupies a very considerable amount of time. During the year Mr. J. Myers, F.E.S., was transferred from the Chemistry Section, and his services have been of great value in enabling Mr. D. Miller, Entomologist, to carry out important field-work without breaking the continuity of the work of this branch of the Laboratory.

Owing to the depredations of the pear-leaf-curling midge in the Auckland Province, where it has become impossible to grow young pear-trees on account of this pest, a special investigation into the insect's life-history was undertaken with a view to control. The life-history has been worked out in detail, and it has been shown that owing to certain features a practical method for control will not be difficult. The investigation has now reached the stage where control methods on an extensive scale can be tried out to determine which will best fit in with the general orchard work of the year. The detailed life-history of the orchard red-mite, which is perhaps the most difficult of all orchard pests to properly control, has also been commenced, and this should lead to the formulation of methods superior to those at present in vogue.

An investigation into the maggot-flies attacking sheep has shown that two species—namely, *Pollenia stygia* and *Lucilia sericata*—are responsible, and the distribution of these two flies is being studied.

The life-history of the ordinary grass-grub has been worked out, and many features have been shown to be of great significance in control. During the year the main insects of plantations, especially *Eucalyptus* plantations, have been investigated, and a publication on forest insects is being prepared and should be issued shortly.

In addition to ordinary routine and investigational work many additions have been made to the entomological collections during the year. These are now rapidly assuming considerable dimensions, and will be of the utmost value in the prosecution of future research in economic entomology.

PURE SEED-WHEAT.

One of the worst features with regard to wheat-growing in New Zealand is the very mixed character of the majority of the seed-wheat used. The Canterbury Agricultural College (Lincoln) has clearly recognized this fact, and Dr. F. W. Hilgendorf has and is carrying out work of the greatest value in the production of pure strains of our main commercial wheats. Certain farmers again have selected pure-strain wheats of great value. The Canterbury Seed-growers' Association, formed some years ago and subsidized by the Department, owes its origin to the necessity for an organization to deal with the distribution of such pure strains, and also to enable a continuous supply of really pure seed to be available from year to year. The work of this association in the distribution of pure seed-wheat has been of the highest importance to wheat-growing in New Zealand, but as it was unable to deal with large quantities of wheat it was decided that the Department should take over the work of crop-inspection and seed-distribution previously carried out by the association. This has been done, and nearly 14,000 bushels of pure seed-wheat has been purchased and sold to farmers at a price that just covers the costs of purchase and distribution. The great success of this method of improving the wheat industry of New Zealand strongly calls for the continuance of the work in future seasons, and it is hoped that in a few years nothing but crop-inspected pure-strain wheat will be sown in the Dominion.