

Field experiments with take-all again failed through the disease not appearing in the control plots. Further work on this disease has been postponed pending the erection of suitable glass-house accommodation. The third cereal-disease survey was carried out through December and January in the districts of Marlborough, Canterbury, Otago, and Southland. As a result it was found that oat-smut was practically absent from Otago and Southland, principally because of the widespread use of the formalin treatment recommended by the Laboratory. Valuable data were obtained concerning the field distribution of the cereal rusts, take-all, and root-rots of wheat and oats. Scab was found to be of slight economic importance, being confined to a few areas where rainfall was heavier than usual.

Experiments with corticium disease of potatoes have been carried through another season, with the result that a considerable quantity of tubers free from this disease has been secured. In plot experiments appreciable increases in yield were obtained over untreated potatoes. Dry dust treatments on the control of this disease proved under field conditions to be useless, even the best of the treatments having a high percentage of viable sclerotia present when the tubers were lifted.

Work on dry-rot of swedes was continued, being mostly in the nature of improved methods of seed-treatment. Several plot areas were run—as, for example, at Gore, where seed of brassicas grown on the farm was treated before sowing. At the time of writing no dry-rot has appeared, though crops in the neighbourhood are generally infected.

A commencement has been made with experimental work on control of club-root of swedes, turnips, and rape. As a preliminary a detailed survey was conducted throughout the Wairarapa, Hawke's Bay, Manawatu, and Taranaki districts. As a result such information was secured as will enable laboratory and field experiments to be carried out on an extensive scale during the forthcoming season.

Work has been continued on the systematics of New Zealand fungi, numerous papers on this class of work being published in scientific periodicals during the year. Considerable material has been added to the herbarium, particularly of rusts and smuts on indigenous hosts.

The usual routine-work—principally identification of plant diseases—has been carried out during the year. This is steadily increasing in amount, largely due to the more active interest farmers and instructors are taking in disease control work.

Fruit Cool Storage.

Most of the fruit cool stores in New Zealand were visited from time to time in the interest of fruitgrowers and for the purpose of putting into practice certain methods that have been shown to succeed by past experimental work.

At the request of the Hawke's Bay Fruitgrowers' Association the supervision of the storage of seventeen thousand cases of Sturmer Pippin apples was undertaken at Westfield, Auckland, where the Department's methods were carried out in detail. The fruit kept most satisfactorily, the last unloaded having been successfully stored for two months longer than is customary in England.

Further experiments were carried out with specially selected apples from three different localities in Hawke's Bay. The fruit from each locality was stored in six different stores in Auckland and Hawke's Bay: such fruit being comparable in all stores, the relative merits or demerits of each store were demonstrated. Advice was given for future improvement. This work is having the effect of generally modifying and improving the methods of cool storage in practice. These experiments also demonstrated the better storage quality of one line as compared with another. The greater susceptibility to flesh-collapse of the larger-sized apples as compared with the smaller ones showed the necessity for so stacking the fruit that the larger sizes might in all cases be watched most carefully and be promptly unloaded if necessary. The post-storage experiments showed that certain lines ex cool store deteriorate more rapidly than others; that stem-rot was the chief cause of such deterioration, and that the exterior apples of a wrapped case suffer less than the interior apples. This work is to be carefully followed up on new and original lines next season.

A tour of the cool stores of Auckland, Hastings, Nelson, and Christchurch was made with Dr. Franklin Kidd, of the Low Temperature Research Station, Cambridge, England. Fruit under experiment was cut for his examination at various stores. Under certain storage conditions no sign of flesh-collapse was found, the fruit at that time having been successfully stored for seven months.

As a result of Dr. Kidd's visit, lines of communication have been strengthened between refrigeration investigators in New Zealand and those operating in his excellently appointed station at Cambridge. Moreover, he has undertaken to examine and report upon a quantity of fruit which is being despatched to him in connection with an extensive set of experiments devised in New Zealand to ascertain the effects of various storage systems and conditions in different vessels upon the keeping of New Zealand apples in transit to England. The selection of the orchards and the picking and packing of the fruit is now in progress. The results should be available for next annual report.

Mr. R. Waters, Plant Pathologist and officer in charge of the Biological Laboratory, who has been responsible for this work, has received an appointment to the Massey Agricultural College. Arrangements will therefore require to be made for the continuance of the work in the future.

Agrostology.

The experiments on regrassing secondary-growth country and inquiries into the best methods of bringing deteriorated hill country back have been continued, and articles relative to the above have been published in the *Journal*. The past summer and autumn have seen many thousands of acres of secondary growth burnt and sown, and it is pleasing to report general acceptance by the farming community of the hardier grasses and clovers such as brown-top, *Danthonia pilosa*, and *Lotus major*, as important ingredients of the seed mixtures sown. This, it is felt, is essentially a step in the right direction. There are still minor differences of opinion as to how much seed of each should be included in the mixture, and many are inclined to adhere to cocksfoot even on the poorer and harder secondary-