

The results of certain physical treatments on the rate of after-ripening is being investigated, and although the work is at present confined to oats, it is anticipated that the findings will prove to be of value in the treatment prior to germination of certain species of newly harvested grass seeds.

Germination of Perennial Rye-grass.—The investigation of the causes of low germination of rye-grass seed in certain production areas was continued and a technique evolved for the examination of immature seed-heads for the presence of the disease—*Pullaria* sp.—responsible for low germination. From this examination the sanitary condition of the immature seed can be determined, and the potential loss in germinating-capacity of the harvested crops estimated. It is considered that an advisory service based on this examination would be of great value to growers, particularly in unfavourable seasons.

Experiments in inoculation of sterile growing plants were continued and although, through scarcity of the disease in the Manawatu, inoculum could not be obtained until late in the season, and despite the infestation of the experimental plants by ergot, the plants were successfully inoculated, thus proving that the disease is the primary factor, and is not secondary to some physiological factors. The work is being continued.

Identification of Agrostis sp.—With a view to establishing a reliable technique for the separation of small quantities of red-top in brown-top, examination of various seed characters has been made, but a reliable method of distinguishing with absolute certainty between the two species was not evident.

Further work, using artificially germinated seedlings has been attended by a fair measure of success, and a very useful method of distinguishing the species at an early stage has been demonstrated. The real measure of its reliability will only be known when a more extensive range of material has been studied.

White Clover: Picric Acid Test.—During the year further comparisons were made between the picric-acid test and the plot-trial method of grading white clover seed according to the value of the strain. This additional work has provided further evidence of the reliability of the test.

In order to obtain a better understanding of the cyanophoric properties of different strains of white clover and of individual plants the study of a large range of single plants has been undertaken in collaboration with the Agrostologist.

Testing Technique.—In the routine testing work problems frequently arise which demand solution and efforts are constantly being made to perfect the laboratory technique. During the past year the utility of low temperatures in germination testing was investigated resulting in the effective use of temperatures of 5 deg. to 15 deg. C. in hastening the germination of many horticultural seeds.

Sensitivity to slight differences in temperature, was found to be the reason for inconsistency and in some instances failure of germination of certain brassica seeds, and many valuable data were obtained for several species of seeds following the use of experimental technique.

GENERAL.

Referee samples have been worked on behalf of the International Seed-testing Association, Copenhagen, and of various Australian Seed-testing Stations through the Council of Scientific and Industrial Research, Canberra, in all of which the Station results have compared very favourably with those of other Stations throughout the world. A large amount of correspondence covering all matters relative to seeds and the seed trade has been dealt with.

One feature is the increasing number of visits of inspection paid to the Station by students, farmers' organizations, young farmers' clubs, and visitors to New Zealand, particularly from Australia, where the reputation of the Station is very high.

ENTOMOLOGY SECTION.

J. MUGGERIDGE, Entomologist.

For convenience the work of this Section is dealt with under two headings, (a) Routine, and (b) Research.

ROUTINE.

During the past year a considerable amount of time was taken up in replying to correspondence concerning the identification of various insect pests and giving information in regard to their control where practicable.

Owing to the abnormally wet conditions in the North Auckland Province there was a serious outbreak of "armyworm" caterpillars. The appearance of the caterpillars in epidemic proportions had the effect of stripping pastures that were being kept for hay or for feeding-off during the late autumn and winter months. The area affected—over 15,000 acres—proved to be low-lying country subject to flooding. A full report on this matter has been presented.

RESEARCH.

White Butterfly.—Work on the biological control of this pest was continued throughout the year, and it is pleasing to report that there was a distinct falling-off in the prevalence of the pest in the areas where the parasite was well established. At the end of the 1935 season the butterfly was under good control in Hawke's Bay, so much so that it was difficult to find a butterfly chrysalid in places where hundreds might be found before; in the Manawatu, Taranaki, and Wellington Provinces during this period parasitism of the chrysalids reached as high as 90 per cent., and consequently, towards the end of the season, in these latter places there was a marked diminution in the prevalence of the pest.

At the commencement of the 1936 season there was every indication that the butterfly was under good control in the areas referred to above. As the season advanced, however, it was noted that it was increasing; at first in parts of Hawke's Bay, and subsequently in the Manawatu and Taranaki Districts. The increase did not bring the population up to the original epidemic proportions, but nevertheless it was sufficient to be alarming. As far as time would permit field studies were made and it was found that, apparently due to wet conditions there was a differential rate of parasitism as between material collected from grass, and that collected from posts.

During the 1935 season no such differences were noted, parasitism of the chrysalids being equally high whether they were taken from grass or from posts. It is possible that this trouble may in the future be overcome by the provisions of suitable places in which the butterfly can pupate.

During the 1935-36 season 79,000 parasites were distributed as follows: Canterbury, 30,095; Auckland, 23,285; Marlborough, 9,850; Otago, 8,060; Nelson, 2,610; Southland, 2,000; Westland, 1,460; Wellington, 1,340; Taranaki, 300; total, 79,000.