

Work in connection with the dry-land type of brown-top promises well towards establishing an improved export trade in this seed, which has proved eminently suitable for the formation of fine close turfs for playing-areas.

Strains and selection work with Yorkshire fog, timothy, and red fescue are also proceeding.

*White Clover*.—The progress of the strain-selection work has indicated that there are two types which under New Zealand conditions appear to give superior results to the noted Kentish Wild type. The superiority exists in the lesser mortality rate of the New Zealand selections, and the fact that they give persistently high leaf-production throughout the whole year.

At present there are indications that the amount of flowering in the seedling year shows fairly accurately the type of the ultimate plant, those which seed freely being of the less persistent and less desirable types of white clover.

The selection designated "Type I" in all trials has made excellent growth of a dense leafy texture, and the strain showed its marked superiority, particularly during the late winter and early spring, when, despite adverse weather conditions, it commenced to make growth while all the other types still remained dormant.

*Red Clover*.—Special attention has been given to selections of Montgomery type red clover, which have been grown under a number of different soil and climatic conditions throughout the Dominion with a view to selecting strains which show distinctly persistent characteristics.

Similar trial-work is being carried out with subterranean clover and *Lotus major*.

Investigations on the regrassing of secondary-growth country in the Taranaki District have been continued, special attention being devoted to seed-mixtures and to methods of pasture-control.

#### BOTANICAL SECTION.

Systematic botanical identifications of species of farm economic plants has been continued, and the volume of work has increased. Careful identifications are fundamental in connection with all experiments of an applied nature.

The Herbarium now contains over 7,500 specimens of indigenous and introduced species, while the section of foreign plants, made with special reference to the importance for research on the introduced flora, contains over 4,000 specimens. The Herbarium is a necessary adjunct to the identification work of the Station.

In order to make the identification work of greater value, specimens of grasses, weeds, and other farm plants are now grown, so that minute observations carried out on individual plants serve to eliminate the possibility of errors likely to arise through the examination of dried specimens.

During the year it has been possible to devote close attention to the strains and species of large groups of economic farm-grasses as represented by *Agrostis*, *Poa*, *Danthonia*, *Festuca*, and *Deyeuxia*.

During the year twenty new species have been added to the list of identified and naturalized plants. Among these specimens, some are of plants occupying considerable areas, evidently established years ago, though unnoticed up to the present. Some of these have decidedly undesirable characteristics, such as saffron thistle, squirrel-tail, *Oxylobium*, *Eupatorium*, and *Calycotoma*. The prompt identification of these undesirable species will give opportunity to place them under control before they have reached a stage when they occupy large areas and eradication made either very costly or almost impossible.

Examination of introduced species has indicated that grave danger arises through faulty identification, and two cases of real interest in New Zealand might be mentioned in this connection. A plant known as Canadian wild rice has on several occasions been introduced, and a considerable amount of what is alleged to be this grass is at present established on the Northern Wairoa River. Close botanical investigation has shown that the Northern Wairoa material is the Manchurian species, and one which has not the desirable characteristics of the Canadian. A species of *Heleenium* recently imported was found not to be true to name, but really a dangerous plant, on account of its poisonous nature to stock.

Systematic botanical investigations are also being made of rushes, piripiri (this in order to co-operate with the control of piripiri by the insect species *Antholcus* recently imported from South America), and brassicas, while co-operation is being maintained with the Royal Botanic Gardens, Kew, in the general systematics of the New Zealand flora.

#### CHEMICAL SECTION.

Analyses of herbage samples from the Marton mowing trials, where different manurial applications were applied, have revealed the following facts:—

- (1) Both the yield and the chemical composition of the herbage are superior in the pasture selected from those plots which have received frequent light dressings of fertilizers as compared with others receiving infrequent and heavier applications.
- (2) The chemical composition of the herbage from plots treated with super has been shown to be superior to that from the slag-treated plots in respect to its content of lime, phosphoric acid, and protein.
- (3) The belief that slag acted similarly to super and was equally effective, only at a slower rate, has not been borne out by these investigations.