

During the year the Plant Research Station was reorganized and has now become the Plant Research Bureau. In this form of organization it is possible to arrange for co-ordination of all work relating to investigations of plants at present being conducted in various Institutions throughout the Dominion. Participating in the Bureau are: (1) The Department of Agriculture and its various Divisions; (2) the Department of Scientific and Industrial Research and its several research sections; (3) Massey Agricultural College; (4) Canterbury Agricultural College; and (5) Cawthron Institute.

The Plant Research Bureau comprises four Divisions—Plant Diseases, Grasslands, Agronomy, and Entomology, while provision is made for a special section to deal with Botany.

With a view to facilitating co-ordination with existing Institutions and for the purpose of conducting researches in districts most appropriate thereto the Divisions have been located as follows:—

Plant Diseases Division	..	..	Mount Albert, Auckland.
Grasslands Division	..	..	Massey College, Palmerston North.
Entomology Division	..	..	Cawthron Institute, Nelson.
Agronomy Division	..	..	Canterbury Agricultural College, Lincoln.
Botany Section	..	..	Wellington.

In order to bring this about it became necessary during the year to arrange for the acquisition of land and the erection of buildings for the various Divisions. At Mount Albert an area of 16 acres of gently sloping land was purchased, and plans are now in course of preparation for laboratories, offices, and glasshouses for the Plant Diseases Division. Plans of new laboratories and offices for the Grasslands Division, to be erected in the vicinity of Massey College, have been prepared. Alterations have been effected to the Entomological Station at Cawthron Institute. New laboratories and offices for the Agronomy Division have been completed on an area adjoining Canterbury Agricultural College, Lincoln.

The Botany Section and the administrative offices of the Bureau have been established in Wellington.

Owing to the arrangements necessarily involved in this policy not being completed it was not possible to transfer the Plant Diseases Division to Auckland or to centralize the Entomology Division at Nelson during the year, and these have continued to function at Palmerston North.

The Plant Research Bureau Committee has met regularly during the year, a policy of co-operation in all aspects of plant research is being gradually evolved, and a much closer measure of co-ordinated effort between research workers, instructors, and teachers is already in evidence.

PLANT DISEASES DIVISION.

(Director: Dr. G. H. CUNNINGHAM.)

INTRODUCTION.

During the year the principal activities of the Division were conducted at Palmerston North, but with the acquisition of the land for the future site of the Divisional Headquarters at Auckland the fruit and spraying investigations have been carried on in that district. The investigations undertaken by this Division relating to fruit are reported in the section "Fruit Research," p. 53.

PLANT DISEASES.

Cereal Diseases.—(a) Organic Mercury Dusts: Comparative trials were completed of new experimental organic mercury dusts for the control of smut and other diseases of wheat, oats, and barley. The results have been communicated to the firms concerned to assist them in improving the materials at present on the market.

(b) Ergot and Allied Diseases of Grasses: Work has been commenced on an investigation of the ergot fungi in order to find the species concerned; their life history in New Zealand; their effects on seed production, particularly in regard to rye-grass, *paspalum*, and other grasses; and, in conjunction with Wallaceville Laboratory, their effects on the health of animals.

Legume Diseases.—(a) Bean-wilt: The trials of New Zealand and imported lines of so-called resistant varieties have shown that a number are highly resistant. Unfortunately, a number of these, particularly those of European origin, are not in demand for New Zealand commercial purposes. One line of Canadian Wonder beans has proved resistant, and with other varieties will be further tested and increased next season.

The principle of rogueing to eliminate bean-wilt has been applied under commercial conditions.

(b) Collar-rot of Peas: The selection of disease-resistant varieties was prevented owing to the persistent unfavourable weather conditions during the growing season.

(c) Pea-mosaic: Field and glasshouse trials have shown that of thirty-two varieties of garden and field peas, eight varieties—viz., Little Marvel, Lord Chancellor, Hundredfold, Wm. Massey, Daisy, Royal Salute, and Autocrat, and the field pea Black-eyed Susan—are immune to pea-mosaic. Evidence suggests that two other varieties—Onward and English Wonder—now under trial are also immune.

(d) Pea-streak: The host range of this disease has been shown to include sweet-peas, dwarf beans, soya beans, *Lupinus luteus*, *Lotus hispidus*, *Trifolium arvense*, tares, &c. Of thirty-five garden and field peas tested none proved to be immune, but several were definitely resistant and were not killed by the disease.

(e) Lucerne Deterioration: Investigations are in progress to determine the possible influence of a bacteriophage in relation to the usual deterioration after a period of time of established stands of lucerne. Up to the present no bacteriophage has been found.

Brassica Diseases.—(a) Soft Rot of Swedes: The field trials at Palmerston North dealing with the pathogenicity of the causal organism and its relation to other diseases and to stocking are still in progress.