

PLANT RESEARCH BUREAU.

Plant Research Bureau Committee: Mr. A. H. Cockayne, Chairman; Dr. F. W. Hilgendorf, Vice-Chairman; Professor G. S. Peren, Massey Agricultural College; Professor E. R. Hudson, Canterbury Agricultural College; Sir Theodore Rigg, Cawthron Institute; Dr. E. Marsden, Department of Scientific and Industrial Research; Mr. R. B. Tennent, Fields Division, Department of Agriculture; Secretary and Chief Executive Officer: Mr. F. R. Callaghan.

The Plant Research Bureau comprises four Divisions and one Section, viz.:—

	Location.	Director.
Plant Diseases Division	Mount Albert, Auckland	Dr. G. H. Cunningham.
Grasslands Division	Massey College, Palmerston North	Mr. E. Bruce Levy.
Entomology Division	Cawthron-Institute, Nelson	Dr. D. Miller.
Agronomy Division	Canterbury Agricultural College, Lincoln	Mr. J. W. Hadfield.
Botany Section	Sydney Street, Wellington	Dr. H. H. Allan.

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 Bureau is organized so as to arrange for co-ordination of all researches relating to plants at present being conducted throughout New Zealand and to associate this work appropriately with the teaching and extension work of the Agricultural Colleges and the Department of Agriculture.

During the year the Agronomy, Grasslands, and Entomology Divisions have been provided with new office and laboratory accommodation, while the erection of similar accommodation for the Plant Diseases Division at Mount Albert, Auckland, has commenced.

Regular meetings of the Plant Research Bureau Committee have been held during the year, and a great deal of progress has been made in implementing the policy of co-ordinated effort relating to investigations of plants and plant products.

PLANT DISEASES DIVISION.

(Director: G. H. CUNNINGHAM.)

As the new buildings for the Division have not yet been erected, the staff is somewhat scattered. Most of the officers are yet stationed at Palmerston North in the unsatisfactory quarters which have housed them for the past ten years; others are situated in temporary offices in High Street, Auckland, and one is stationed temporarily at Hawke's Bay.

In January the Division's entomologist, Mr. W. Cottier, was transferred to Auckland. Mr. J. G. Gibbs returned to duty in October, 1937. He has been absent on special leave for the past two years, working in the United States of America under a Commonwealth Fund Service Fellowship. Mr. W. D. Reid was sent abroad in March to the University of Edinburgh for an intensive post-graduate course in bacteriology.

Officers responsible for the different investigations are indicated at the end of each section.

I. MYCOLOGICAL INVESTIGATIONS.

(a) *Brassica diseases.*

(1) *Dry-rot*.—A technique had been developed for study of the longevity of the dry-rot organism (*Phoma lingam*) in the soil. By this means it has been possible to ascertain that the disease may persist in infected soils for two seasons.

An infected line of swede-seed has been obtained by artificial inoculation of siliques. This material, which carries 3.5 per cent. infection, is being used in further work on seed disinfection.

(2) *Club-root*.—Two strains of club-root-resistant rape have been hybridized, with a view to producing a more resistant rape with desirable feeding-qualities. Seed harvested in December has been sown in the glasshouse to secure F₂ seed for sowing in the spring of 1938.

Seed of seventy selected selfed resistant rape plants and of fifty-two swedes were sown on club-root-infested soil at Palmerston North and Auckland to test for resistance. At Palmerston North four strains of rape showed a high degree of resistance, but none of the swedes survived infection. Auckland results have not yet been secured.

(3) *Soft-rot*.—It has been determined that the soft-rot disease of swedes and turnips in New Zealand is due to two bacteria, *Bacillus campestris* and *B. melonis*. Entry is gained through injuries, usually leaf scars, and facilitated by animal injury or previous attacks of virus disease.

(4) *Turnip-mosaic*.—Additional hosts for this virus have been found in wart-cress (*Cardamine heterophylla*) and wallflower. The physical properties of the virus have been ascertained.

(b) *Grass diseases.*

(1) *Low Germination of Rye-grass*.—A thorough investigation has been made of field conditions associated with the problem. Several fungi have been isolated from seed heads and are being tested for their respective effects on the seed. This work was carried out in co-operation with the Grasslands Division and the Seed Analyst.

(2) *Ergot of Grasses*.—About forty strains have been collected from different Dominion-wide localities and are being grown in cultures for comparative studies. Experiments are in progress to ascertain the most satisfactory method for early testing of strains of grasses to ergot susceptibility.