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; Messrs. C. A. Marchant and Alan Grant, representing North Island and South Island farmers respectively; Mr. F. Callaghan, Secretary and Chief Executive Officer.

The Plant Research Bureau now comprises five Divisions, viz.:—

	Location.	Director.
Plant Diseases Division	Owairaka, 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 Division	58 Bowen 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.

Quarterly meetings of the Plant Research Bureau Committee have been held during the year, when programmes and progress of the research work have been reviewed.

AGRONOMY DIVISION, LINCOLN.

Director: Mr. J. W. Hadfield,

This Division is concerned with all phases of crop improvement, and this objective is approached mainly by plant introduction, plant breeding, and pure-seed production.

Wheat.—The production of pure and smut-free seed wheat continues each season to be a useful service performed by this Division. Nucleus seed is raised annually from single plant selections and is sold to the Canterbury Agricultural College and selected growers, who increase and distribute the product under Government certification. The following varieties were grown during the past season: Cross 7, Dreadnought, Tainui, College Hunters, Montana King, Marquis.

Oats.—Five new varieties were imported during the past year, making the total number of varieties tested 117. Of those imported during recent years, three are worthy of mention—namely, (1) Binder, an importation from Holland, which not only stands better, but has considerably outyielded Abundance in two consecutive seasons; (2) "Line 834," an introduction from Belgium, which has, for a second time, outyielded all other varieties: (3) Victorian hybrid, which has proved to yield as well as Abundance, and, in addition, has shown a high degree of resistance to both stem and crown rust.

The most advanced breeding material—namely, Ruakura × Lampton has now reached the seventh generation. Ten lines either equal to or better than Algerian in yield are being further tested, and seed will be available for field trial in 1941–42. Due to the very limited material available for crossing when this work started, these F_7 segregates are not as promising as some more recent crosses in which full use has been made of the most recent improved material obtained from overseas breeders. Of the cross Ruakura × Abundance now in F_6, five lines remain equal to or better than Abundance. The F_4 material consists of crosses between Resistance and several other varieties of particular merit, and the segregates appear very promising in regard to yield, grain quality, and strength of straw. Material now in F_1 and F_2 consists mainly of crosses between standard varieties and material recently introduced and proved to be highly resistant to leaf and stem rust.

Barley.—Of some forty varieties of malting barley originally introduced, five varieties deserve further trial. Severe bird damage so reduced yields in the increase blocks that there has been insufficient seed for malting tests, and all seed that has been saved will have to be resown.

Of sixty-nine six-rowed barleys that have been under trial for some years, two, one being a smooth awned variety, Newal, and the other Oderbrucker, are very promising as green-feed barleys and appear to give a satisfactory yield of seed. Their early growth is considerably more rapid than either Cape or Black Skinless.

Field Peas.—Great Britain cans one hundred million cans of dried peas per annum, using for this purpose about 500,000 bushels of dry peas, of which 70 per cent. to 80 per cent. are imported from the Continent and Japan. This is exclusive of the large quantity sold as dry peas in packets. New-Zealand-grown peas are not acceptable in Great Britain for canning on account of their hardness and the toughness of their skins. A project was commenced some years ago to breed varieties suitable for New Zealand and more acceptable to the British trade. While these efforts have resulted in improvement in yield and appearance, it has not been possible to overcome hardness and toughness. These features appear to be associated with climatic conditions.

More progress has been attained in the production of a high-yielding white pea for the split-pea trade to replace White Ivory, the yields of which are too uncertain.

It was hoped that trials conducted this past season would finalize many points regarding the segregates now fixed and ready for distribution. Unfortunately, weather conditions rendered the trials inconclusive and they will have to be repeated next season. It is also intended to extend these trials more widely over New Zealand than has been possible in the past.

Garden Peas.—Attempts to improve on Greenfeast in the matter of yield and double podding have met with partial success. These segregates have for some years given satisfactory results in the