

Staff.—The services of Mr. S. H. Saxby were lost to the Section during the year. The loss of this trained officer to a position in the Service for which he is not so well fitted is much regretted.

Mr. L. Corkill has been engaged as Plant-breeder on a temporary basis, and his permanent appointment should receive early consideration.

It has been very gratifying that all officers connected with this work have again performed a strenuous year's work in a most satisfactory manner. The work at the Station area has been efficiently run under the overseership of Mr. Todd, and it is anticipated that with the permanent labour now available there even better work in the future will be accomplished.

AGRONOMY SECTION.

(By J. W. HADFIELD.)

The work of the Agronomy Section has been carried out, as in the past, at the Pure Seed Station, Lincoln, and at the Plant Research Station, Palmerston North.

Growing-conditions were favourable at Lincoln, and heavy yields resulted, but the harvesting conditions caused heavy losses, 16·22 in. of rain being recorded for February and March. The season was very late at Palmerston North, and conditions far from ideal for seed-setting.

Wheat.—The policy of producing nucleus lines of pure and smut-free seed has been continued, and it is satisfactory to report that the Canterbury Agricultural College has taken over much of the seed so produced. The balance has gone into the hands of seed-growers, and will be distributed under certification.

Several new wheats were placed under yield trial. Lin Calel, a variety from South America, shows promise in baking-quality and yield when autumn-sown. Ben Cubbin, an Australian wheat, may have merits as a spring-sown variety.

Oats.—The main work has consisted of an extensive yield trial comprising most of the New Zealand commercial varieties and several introductions from overseas. Of the recently imported varieties, Resistance, raised by the National Institute of Agricultural Botany, proved very promising for Canterbury, Otago, and Southland conditions. It is not yet fixed in type, and its high susceptibility to rust renders it quite unsuitable for North Island conditions.

Breeding-work has been confined to the selection of crosses suitable for North Island conditions, with rust-resistance as a special consideration.

F₃ seed has been harvested from Ruakura × Algerian × Lampton × Ruakura ;

F₂ seed has been harvested from Lampton × Gartons × Ruakura.

Garden Peas.—Acre lots of nine varieties were grown under order for various merchants to replace their deteriorated stocks. The demand for good seed is very keen, and the area devoted to this crop could well be increased.

Breeding has been confined to two crosses from which F₃ and F₄ seed was harvested. The following results indicate the increases in yield secured :—

Cross 11 (Greenfeast × Harrison's Glory) × Greenfeast.

Cross 8 Greenfeast × Great Crop (Yorkshire Hero).

—				Pod-length.	Peas per Pod.	Weight per 100 Seeds.	Yield of Seed per Plant.
				In.		Grm.	Grm.
Parent Greenfeast	..	..	..	3·75	8·5	28·6	37·5
Parent Great Crop	..	..	..	3·25	5·6	43·4	52·0
16 families Cross 11	..	..	..	3·6	7·1	32·0	64·0
8 families Cross 8	..	..	..	3·5	7·7	34·5	74·0

Field Peas.—A wide range of crosses between varieties of field peas and between field and garden peas is being worked with. Unfortunately, two adverse seasons have been experienced, and, although some progress has been made, it has been impossible to evaluate at all satisfactorily the material on hand.

Potatoes.—Trials are being undertaken of several recent introductions, including the American varieties Chippewa and Katahdin.

Several hundred crosses were made between *Solanum andigenum* (a wild species from South America) and standard commercial varieties. From these about eighty fruits were saved, and it is intended to explore the possibilities of these hybrids next season.

Lucerne.—Breeding commenced in 1931. By inbreeding and selection it has been possible to advance along two lines. In the first, those parents which have given consistently good inbred progenies were grouped according to type, and the parents crossed one with the other. The F₁ progenies of these crosses have been under trial this past season and have given, over a period of three cuts, substantial increases over Marlborough commercial.

Marlborough commercial	..	..	..	..	..	..	= 100·0
14 F ₁ families of flat types range from 114·9 to 137·9 : Average	..	..	..	..	..	..	= 128·1
14 F ₁ families of upright types range from 97·3 to 123·0 : Average	..	..	..	..	..	..	= 108·9
40 F ₁ families of intermediate types range from 99·2 to 146·1 : Average	..	..	..	..	..	..	= 124·1

Plants have been selected from within the best F₁ families, and these will be used for strain-building. In the flat and intermediate groups only those families yielding above 130 will be used, and in the tall only those above 110.