

Oats.—Of the many recent introductions, four—namely, Binder, Line 834, Elder, and Victoria × 524—have shown sufficient promise to warrant extensive trial, and increase areas of each were grown to provide seed for the purpose.

Several lines developed from the crosses Ruakura × Lampton and Ruakura × Gartons Abundance were under trial during the year.

Barley.—Increase areas were grown of the two six-row barleys, Newal and Oderbrucker, which were received from Canada, and which have proved to be superior to Cape and Black Skinless in regard to rapidity of growth for green feed. The produce will be used for extensive trials.

Twelve varieties of two-row malting barley were grown at the Division to enable single plant selections to be made. Eleven of these, excluding the new variety Rex, have significantly outyielded the standard varieties in previous trials, and were grown this season in an extended trial by the Canterbury Seed Co. to provide material for malting tests.

Linen-flax.—Seed-production: To provide pure and disease-free stocks for the newly established industry, nucleus supplies of the following varieties were raised from hot-water treated seed: Liral Crown, Concurrent, and Stormont Cirrus. Small increase areas of Hercules, Blenda, and Triumph, which are recent introductions, were also grown.

Breeding-work: A number of F.2 lines from crosses between the disease-resistant Rio linseed and various fibre varieties were grown. No disease was seen on any of them. If possible, these will be carried on with a view to developing a disease-resistant fibre strain.

Weed Control: Sinox, the sodium salt of dinitro-ortho-cresol, has been tested for the control of weeds in linen-flax. The trials show it to be of outstanding value in controlling fat-hen, wireweed, and black bindweed in linen-flax experimental areas.

Processing: The straw from a number of variety trials carried out by the Department of Agriculture was deseeded, retted, and scutched, seed and fibre yields determined, and the results forwarded to the officers concerned. pH and buffer capacity curves were plotted for all flax rets carried out, the aim being to establish an easier method to determine the end point of a ret than the usual physical tests. No easier method was found, although much information was obtained on the effect of liquor dilution and the advantage of close control of temperature. Experiments on a small scale at Lincoln and on a commercial scale at the Leeston Flax-factory were carried out to determine the effect on material spread out for dew retting of daily spraying with water. The results demonstrated that the period of retting could be reduced by as much as 30 per cent.

Rape.—Three acres of Giant rape, yielding 3,310 lb., and 3 acres of Broad Leaf Essex rape, yielding 3,060 lb., were grown for increase and distribution under certification. A distinct type developed from the cross (Giant × Broad Leaf Essex) × Broad Leaf Essex behaved very satisfactorily both in trials at the Division and in trials arranged by the Fields Division, Department of Agriculture.

Marrow-stem Kale.—Two distinct selections have been raised by the Division; one is a tall type with a well-developed stem and a comparatively low proportion of leaf, and the other a shorter, more leafy form. One acre of each was grown last season, the tall type yielding approximately 300 lb. and the shorter one 350 lb. seed.

Garden Peas.—The policy of growing reselected stocks of the main commercial varieties for distribution to merchants is being maintained, and the following varieties were grown during the past season: Greenfeast, Onward, Little Marvel, William Massey, and Harrisons Glory (Marrowfat).

A promising selection, 8/13/2/3, developed from a cross between Greenfeast and Greatcrop, is a green-seeded Greenfeast type and is being increased for distribution.

Field Peas.—A new blue boiling pea, 5/7/1/6, developed from a cross between Blue Prussian and Harrisons Glory, and a new white splitting pea, 3/42/3, developed from a cross between Blue Prussian and Greenfeast, considerably outyielded their respective controls, Blue Prussian and White Ivory, in trial plots this year. Both also were increased at Lincoln College, and good yields were obtained.

Another promising white-seeded type is line 12/10, a cross between Victoria and Stratagem. It possesses very large attractive seed, and in trials this year slightly outyielded White Ivory. A small increase block was also grown.

Lupins.—Two acres of the sweet blue lupin and 1½ acres of the sweet yellow lupin were grown to provide reserve stocks of pure seed. Samples of sweet-blue-lupin seed harvested from commercial areas, submitted for alkaloid test, have proved that the crops concerned are suitable for certification.

Sweet blue, sweet yellow, and New Zealand blue lupins were compared in a replicated trial. The establishment of the first two was rather poor. A similar trial was carried out by the Grasslands Division at Palmerston North, and the yields per acre in the two trials are shown below:—

	Lincoln.			Palmerston North.		
	Green Weight.	Dry Matter.	D.M.	Green Weight.	Dry Matter.	D.M.
	lb.	lb.	Per Cent.	lb.	lb.	Per Cent.
New Zealand blue	33,324	5,865	17.6	37,268	3,950	10.4
Sweet blue	25,192	4,308	17.1	35,816	4,119	11.5
Sweet yellow	27,359	4,104	15.0	33,880	2,914	8.6

Weights at Lincoln were taken at the end of flowering, before the leaves started to wither, while weights at Palmerston North were taken at the start of flowering.

At Palmerston North, in addition to ascertaining the yields given above, indoor feeding trials with sheep were carried out, chemical analyses were made, and a grazing trial for determination of palatability conducted. In the latter the ratio of preference was approximately, sweet yellow, 10; sweet blue, 8-9; New Zealand blue, 1.

Potatoes.—Work on potatoes is being confined to testing the behaviour of a large number of hybrid lines many of which have been raised from crosses between commercial varieties and "wild" types obtained indirectly from South America.

Lucerne.—The first pedigree strain raised from a combination of several plants of the Marlborough variety selected on the performance of their inbred progenies was placed under trial against Marlborough in several districts last year.