

Elite Strain Work.—The block of $\frac{3}{4}$ acre of selected pedigree rye-grass was harvested for seed and yielded 762 lb. of roughly dressed seed. The major portion of this seed has been sown out locally on 20 acres for increase growing under contract. The above yield will show how rapidly valuable stocks of seed may be increased. In 1934 300 grammes were harvested; a portion of this (about 100 grm.) was sown out in a nursery bed. Later some 33,000 plants were transplanted from this bed to the increase area of $\frac{3}{4}$ acre, from which 762 lb. of seed were harvested. Owing to the very hot weather experienced during flowering time, this year's selection within the glasshouse set only a very small amount of seed. This has been sown out in boxes for later planting-out.

RELATIVE YIELD OF PEDIGREE MOTHER SEED RYE-GRASS, ORDINARY CERTIFIED RYE-GRASS, AND BRITISH INDIGENOUS RYE-GRASS.

The following green weights were taken on each of 100 plants of the following on the 18th April, 1935 :—

				Weight.	Relative.	Difference from Mother Seed.
				Oz.		
Certified mother seed	..	..	..	591	100	..
Selection	..	..	..	1,175	199	+99
British indigenous	..	..	..	303	51	-49

Low Germination of Rye-grass.—In an experiment designed to test the value of treating seed with hot water with the object of deciding whether or not any influence is made on the resulting seed crop, no conclusive results were obtained. From other evidence it would appear that hot-water treatment has no beneficial effect.

A further experiment has been laid down at Winton and duplicated at Palmerston North. In this the problem is viewed from the strain point of view. A large number of as many strains as possible have been sown out. These will be harvested and germination figures determined. In this manner it is hoped to locate definitely which strains produce high germinating seed and which produce low. From this stage it is hoped to work up a strain which in type is up to certification standard and which will germinate well when seed crops are grown in a normally wet climate.

Single-plant Study.—Four thousand single plants (forty lines) of low ultra-violet testing South Island perennial rye-grass have been put out for selection and study. Routine work in connection with planting out of tiller rows has been continued.

COCKSFOOT.

Certification and other Trials.—The following number of plots have been sown: Spring, 1934, 72; autumn, 1935, 136. There is nothing further to report in connection with the above, as this testing has developed into simple routine. The only fact worthy of notice is that New Zealand cocksfoot as a whole is dominantly of the certified type. No Danish cocksfoot is showing in the many lines tested. New Zealand cocksfoot from the type point of view is in a very satisfactory position.

Single-plant Study.—Twelve hundred plants of Akaroa and Plains cocksfoot have been planted out for study. Up to the present no differences have been noted between Akaroa and Plains, but a marked non-uniformity of plant type in both Akaroa and Plains is noted.

Thirty tiller rows of various types of cocksfoot have been planted out for study of their behaviour under grazing.

BROWN-TOP.

As with cocksfoot the strain position of brown-top is very satisfactory, there being extremely few samples containing red-top.

Sowings made are as follows: Spring, 156 plots; autumn, 170 plots. The most satisfactory sowing for brown-top strain trials is in rows sown in the early autumn.

ITALIAN RYE-GRASS.

The following plots have been sown: Spring, 155; autumn, 112. The testing of Italian rye-grass is most satisfactory if two sowings are made. The autumn sowing distinguishes the Italian and Western Wolths from perennial of poor type and the spring sowing distinguishes Italian from Western Wolths. On the whole the New Zealand Italian rye-grass is poor, and the Department has this season inaugurated a certification scheme for Italian, the certified lines being of Irish and French origin. A number of lines of imported Italian are being tested as single plants with a view to selection.

Elite Strain Work.—See genetical report.

CLOVERS.

WHITE CLOVER.

Certification Trials.—A total of 1,179 plots have been sown. Spring sowings consisted of 845 plots, and the remaining 334 have been sown in the autumn. Notes have been taken and a herbage test has been made by the Chemist on each of the spring-sown lines. All the 978 lines sown the previous year have been finally reported on.

Single Plants.—The original block of tiller rows has been retained. Complete records of these have been kept, and in the spring the ten best plants were selected for making a glasshouse selection and a total of twenty promising plants were selected and subjected to breeding tests by controlled crossings and selfings.

The 6,200 single plants from open pollination of selected plants and planted out in 1933 have been reduced to fifty plants. Another 700 plants from controlled crossings planted out at the same time have been reduced to twenty plants. These seventy plants, together with thirty plants from the original tiller-row block, have been planted in a new tiller-row block on the Council area.

A study of the 5,500 plants from the 1933-34 controlled crossings has been very interesting. These have shown extensive differences in uniformity and production of the F1 families, some being very good and others very poor. Type I plants crossed with Dutch plants show Dutch characters and weaknesses as being dominant over the desirable characters of Type I. These F1 families demonstrate clearly the need for breeding-tests as an aid to plant selection and improvement as well as the need for a certain amount of care in preventing hybridization of good types with poor types when a pedigree seed line is being increase-grown or contract-grown for seed-production.