Type 2 gives a smaller initial yield, but greater recovery than type 1 after cutting. In these trials it has continued to produce feed after repeated cuttings up to early spring without developing flower-stalks.

Type 3: Both initial yield and recovery are poor. After one or two cuttings the plants either die or develop flower-stalks.

Rape is sold in New Zealand under such trade names as "Giant," "Kangaroo," "Broad-leaf Essex," "Colonial," &c., but such names are no indication of type.

Kales, Rape Kales, and Chou Moellier.

Following the lines adopted with rape, samples were collected from all possible sources and grown during the past season in such a way as to make individual plant study possible. Palatability trials are being undertaken at Marton Experimental Farm, and chemical analyses by Mr. Doak. All lines of thousand-headed kale and chou moellier were true to name. There is no ambiguity in regard to the naming of these. There are two types of rape-kale, one of which gives no recovery after cutting. Moreover, there is field evidence which seems to indicate that one is very unpalatable. There are similarly two types of Buda kale. One is distinct from all other material grown in these trials, while the other is, so far as can be ascertained at present, identical in every way with rape type 2.

Turnips and Swedes.

In view of the interest at present evinced in turnip and swede seed production in New Zealand, it seemed desirable to study the varieties being imported into this country and compare their purity with locally produced seed. Duplicate plots were sown of all varieties from all available sources. Details are not yet available, but it is fairly evident that imported root seeds attain a very high standard of conformity to type. The few samples of Dominion-grown seed are of equally high standard, and no great deterioration could have been expected since they are but once removed from imported seed.

Lucerne.

The objective is—

(*a*) The production of a better hay type.

(*b*) The production of a dual-purpose type which will stand reasonable grazing and at the same time afford one or two cuts of hay.

Samples were collected from all sources, but mainly from old pasture in Marlborough. The seed was sown in the nursery, and in the spring of 1930 about 3,600 seedlings were planted out 30 in. by 30 in. for individual observation. Careful records have been kept of each plant. In 1931 sufficient evidence had been collected to discard all except 250 plants, and these represent what appear to be superior types and therefore worthy of further study.

Cuttings were then taken from each and grown in the nursery. Sufficient of these struck root to enable the transplanting of (*a*) five plants together to form a clump, (*b*) four replications of single plants. It is expected these clones will afford (*a*) evidence as to whether the parent plant was unduly favoured by environment; (*b*) a more accurate estimate of yield and general behaviour, (*c*) material from which to produce seed if required later.

After removing the cuttings, the original 250 plants were covered and allowed to seed. The covers afforded protection against insect pollination, but not against wind pollination. The flowers were not artificially tripped either by hand or by agitating the plants. A start was made to agitate vigorously the plant within the cover, but this was discontinued in view of the fact that pollen was by this means distributed over a wide area and might very easily have resulted in cross-pollination. In most cases sufficient seed was set on each plant for immediate requirements. This selfed seed has now been threshed and was sown at once. Germination is satisfactory and it is hoped to get the plants out in early spring, planting sufficiently wide apart for individual study. We have in view in this project two stages:—

(*a*) The discovery of several lots, containing one, two, or more lines of a similar type, reasonably homozygous in the more important characters and superior to the general average. Plants of a similar kind would then be seeded together and the lots put out under field trials.

(*b*) The second stage is one that will occupy many years, and will consist of the standard method of selfing for several generations the most vigorous and desirable plants in the most homozygous lines.

A few selfed lines have been under observation during the past few years. It would appear from these that even once selfing may be expected to result in marked progress toward uniformity, accompanied, however, by a certain loss in vigour. It is not unreasonable to hope that the fixing (within reasonable limits) of some of the superior types may not be unattainable.

AGROSTOLOGY SECTION.

E. Bruce Levy, Agrostologist.

STRAIN IN PASTURE PLANTS.

Strain in pasture plants has dominated the work of this section during the year under review. The application of the work and its extension by farmers and the seed trade is now limited by the smallness of the stocks of certified seeds available for distribution. The seed trade and the farming community as a whole are rapidly becoming convinced that the advocacy of "strain" is sound and are now prepared to accept "pedigree" in pastures on the same basis as pedigree in stock.

Slowness of breeding and high price of pedigree animals has limited the general acceptation and application of "pedigree" in stock throughout New Zealand: this must be avoided at all costs as far as pedigree in herbage plants is concerned. The pedigree strains in herbage plants are almost as prolific as the poor, and the project that should now be embarked upon as a national project is rapid reproduction on a commercial basis of lines that are by test up to pedigree standard. The rye-grass work is developing well, but last year too much mother seed found its way either into permanent pasture areas that will never be harvested for seed, or else was shipped overseas. The work of locating areas carrying good strains of white clover, cocksfoot, &c., should be rigorously pursued and every endeavour made to shut up these areas for seed-production. New Zealand has a splendid range of types of the main herbage plants, and up to date our field