

Kale.—The practice of growing chou moellier (marrow-stem kale) as winter forage both for cattle and for sheep is now being widely adopted. This crop, however, as it matures tends to shed its lower leaves and thereby is reduced in value. As it was considered that some improvement in this respect might be effected by breeding methods, chou moellier was crossed with several allied types. Of the hybrid material investigated, selections from the crosses chou moellier $\times$ thousand-headed kale and chou moellier $\times$ cabbage show some promise. Trials of these types were undertaken during the year at Lincoln, Gore, Palmerston North, and Gisborne and were sufficiently satisfactory to warrant increasing the hybrid forms for further extensive trials.

Swedes.—During the past season aphid infestation of brassicas was unusually severe, and swedes, particularly, suffered considerable damage. An observational trial had been sown to compare the behaviour of New-Zealand-grown varieties with that of imported lines, and whereas such varieties as Grandmaster, Superlative, and Crimson King were very heavily infested with aphides, the hybrid type, Dryland (Grandmaster $\times$ Sensation) and Sensation, showed considerable resistance, particularly in the early stages. This result tended to confirm the opinion that the Dryland variety might be a useful swede for Canterbury, and arrangements have been made to have it multiplied for further extensive trials. It has also been crossed with Superlative in an endeavour to eliminate the fangy nature of the bulb.

Linen Flax and Linseed.—The breeding-work on these crops is being maintained and it has for its objective the production of a high-grade fibre flax and a high-grade seed flax that are resistant to rust and to wilt. Rio, a linseed variety, has been used mainly as the resistant parent.

Lucerne.—The development of a lucerne type which would be more satisfactory for grazing than existing varieties would be an important advance. The spreading species, *Medicago glutinosa*, has several characteristics which fit it for such a purpose, but it also has several unsatisfactory features. It has been crossed with *M. sativa*, therefore, in an endeavour to combine in one type the better characteristics of both species, and during the past season approximately two thousand plants derived from this cross were planted out for observation and selection.

Potatoes.—The potato-breeding work is being maintained on a restricted basis until the return to the Division of an officer who has been stationed for some years at a Potato Research Station in Great Britain. Fifty-five hybrid lines were included in a yield trial and several in small increase plots. Most of these are from crosses between Katahdin and other imported commercial varieties, local commercial varieties, or *S. andigenum*, but most of them show signs of infection to a more or less degree with one or other of the virus diseases. Three lines were entered in the certification trials, and two of them, both derived from a cross between Katahdin and *S. andigenum*, show some promise.

Maize.—A maize-breeding project has been commenced in Poverty Bay. During the year forty-five hybrid lines were received from America and were sown for trial purposes on an area near Gisborne. These are being kept under observation, and if any particular one proves to be superior to varieties used locally it will be necessary to consider the following points:—

- (1) Whether sufficient of the hybrid seed itself should be imported each year for local use; or
- (2) Whether the inbred lines from which the hybrid type has been created should be introduced, maintained, and used to provide the necessary hybrid seed for local use.

In addition, a second cycle of inbreeding has been started with this material and also a first cycle on some local varieties in an endeavour to produce our own inbred lines from which might be raised our own hybrid seed. Approximately one thousand self pollinations were made during January–February.

Tomatoes.—A reinvestigation of hybrid vigour in tomatoes is being undertaken.