

Barley.—Pure seed of standard varieties has been produced in the past and may again become desirable. In the meantime arrangements are in hand for the testing of a number of New Zealand and foreign varieties next season.

Maize.—Owing to the prohibition of imports from tick-infested areas in Australia, extensive variety trials which had been arranged for in the North Island had to be abandoned. Maize is perhaps the easiest crop that the dairy-farmer can grow for pig feed, and investigations are urgently required to determine which, if any, of the existing varieties can be grown with reasonable hope of success in those districts where this crop is at present regarded as too unreliable for general cultivation. Material for further trials next season is on order from abroad.

Garden Peas.—Seed of garden peas is grown extensively in New Zealand for export. Seed stocks which become impure have in the past had to be replaced by the importation of fresh stocks from overseas. These at times are little if any better than those discarded by the merchants, and it is desirable that they should be able to see the growing crop from which their stocks are to be drawn.

Following the practice adopted for some years, an area of about 8 acres has been devoted to the raising of nucleus stock seed of garden peas on contract with merchants. This activity has been much appreciated, but is likely to be curtailed in the near future and attention devoted to the multiplication of new crosses which are now showing great promise in F_6 .

Green-feast is undoubtedly the most popular variety in this country and Yorkshire Hero perhaps the heaviest yielding. It is from the crossing of these two varieties that some very promising segregates have been raised in which are combined desirable features of both parents.

Field Peas.—Field peas afford a crop that can be handled conveniently on dairy-farms and should be more extensively grown as a supplementary feed for pigs during winter. Attempts to decide on the most suitable variety for North Island conditions have not so far met with success. The trials laid down this past season failed on account of unusual seasonal conditions.

Supplies of seed of the Austrian Winter Field pea have now been raised, and the variety is being tested out as a cover crop by the Horticulture Division of the Department of Agriculture on a large number of orchards. Its chief virtue lies in winter hardiness, and it proved far superior in this respect to Partridge when autumn sown at Lincoln.

The major work in this crop has been an attempt to improve the yield and quality of peas grown and dried for local consumption and export. Of all varieties the heaviest yielding and most extensively grown is Partridge. A valuable export trade has developed, and the variety is used locally in the manufacture of split peas. Any improvement, therefore, in either yield or quality would be of considerable economic value. A new selection of Partridge introduced from England via Tasmania has this past season outyielded New Zealand Partridge by 39 per cent. Being later than the New Zealand strain it was favoured by the wet season, and this figure is probably an overestimate of its performance in a normal season.

In export quality it probably falls short of the New Zealand Partridge, being paler in colour and more dimpled, and the latter characteristic is likely to render it unpopular for splitting. Nevertheless, the increased yield should outweigh any discrepancy in price, and the variety will have a very definite place as a crop for pigs and sheep. Further trials are being arranged, and the seed stocks are being multiplied by Canterbury Agricultural College in anticipation of a demand.

An extensive breeding programme in field peas, now in F_4 and F_5 is progressing, and results are promising.

White Ivory is regarded as the ideal pea for splitting, but owing to erratic yields it is difficult to obtain and merchants have had to resort to the use of Partridge. Blue Prussian is the standard blue pea for boiling and canning, but here again the yield is unreliable and the quality such that it compares very unfavourably on the British market with British- and Continental-grown peas. It is in an endeavour to rectify these defects that the present breeding programme has been instituted. High-yielding segregates of correct type have been produced but their quality is a matter yet to be investigated.

Potatoes.—In view of the efficacy of seed certification, the production of pure and healthy seed potatoes is now regarded as unnecessary, and the Division's work in this connection has been discontinued except in the case of a few new introductions.

Attention is now almost entirely devoted to the breeding of new varieties by crossing commercial varieties with certain of the species recently discovered in South America and introduced by Russian and German explorers. Initial crosses were made in 1935-36, and the F_1 plants raised this past season. It is too early yet to comment on these progenies, many of which have not yet been harvested. Relatively few of them appear, however, to be of a type that might be of commercial value, and it is evident that back-crossing on to commercial varieties will have to be resorted to. This project is surrounded with difficulties, perhaps the greatest being that of devising effective isolation to prevent the spread of virus disease.

Rape.—The original selection work has led to the commercial production of rape seed in New Zealand under certification. This Division now produces annually mother seed of Giant and Broad Leaf Essex varieties which is distributed to merchants who grow the certified seed on contract. There has been a ready sale for certified seed, and much appreciation has been expressed by farmers in respect to its standard. It is important to record that the prejudice against New-Zealand-grown brassica is thus being removed, and the way is open for further development in this direction.

Present indications are that segregates from crosses between Broad Leaf Essex and Giant, back-crossed on to both parents, are likely to prove more productive and of better type than either parents. An annual swedelike rape is also being used for crossing purposes in an endeavour to introduce early maturity. Other crosses between rape and various kinds of kale are also being studied.

Swedes and Turnips.—Most of the varieties resistant to club-root are regarded as too high in fibre content and not of a type to appeal to farmers. Crosses between popular but non-resistant varieties