

The method adopted entails, first, a search for virus-free plants. Tubers taken from such plants are termed "tuber units." Each tuber is cut into four parts, planted out, and carefully observed during growth. Tuber units showing disease are rogued out immediately, and at digging only the best are kept. These are then planted out for increase, and further rogueing and selection goes on over several seasons. When sufficient material is available to plant an area for distribution the line is entered in the certification trial for comparison with commercial lines.

In addition to raising lines as above, nucleus lines were imported from Scotland and Ireland. These carried very little virus and they have given very gratifying results.

The area under potatoes this year comprises some 19 acres made up as follows: Tuber units, 1,992; 1929 selections, 438; 1928 selections, 55; 1927 selections, 8; imported lines, 29.

To prevent, if possible, the spread of virus among the tuber units, the area devoted to this work was divided into squares by belts of oats sown in September. One tuber unit was planted in each square, and was thus sheltered from the neighbouring tuber unit. The oats made splendid growth, but the efficiency of the method cannot be determined till next season. A special trial to test the efficacy of this method, and using diseased and healthy tubers has been laid down.

The 1929 selections have been heavily rogued, and the remaining lines appear very promising. Many show no virus disease whatever, the greatest percentage allowed being 5 per cent. in a few cases. The 1928 lines have also received close attention. Of the fifty-five lines planted thirty have been discarded. The remainder are of high standard, some being practically free from virus. Provided the standard is maintained, the eight 1927 selections will be available for distribution this season from areas varying from $\frac{1}{4}$ acre to 1 acre.

The imported lines vary from $\frac{1}{2}$ acre to 1 acre. Considering the dry season, they are well grown and are very healthy. A comparison between this season's disease counts and those made last season indicated that the rogueing last season has reduced the amount of disease present. In order to determine the merits of some of the lesser-known imported varieties seed has been distributed to twenty different centres for trial under varying conditions. These trials are under the control of the Crop Experimentalist. Forty-eight lines have been received from various sources and are being grown for identification.

GARDEN PEAS.

Seed-production of garden varieties, &c., is an important feature of the arable farming in Marlborough and Canterbury, and as an export trade is one to be fostered. Peas deteriorate very rapidly, and no seed produced on the farm receives such close and critical inspection. No doubt the threshing-mills are responsible for a large proportion of the impurities. Apart from this, however, garden peas persistently revert to recessive types. Probably it is not altogether possible to check this reversion, but a great deal of improvement can be effected. The usual method adopted by merchants is to rogue fields during flowering-time. The system is both expensive and ineffective. It removes only the most obvious impurities.

The work undertaken in garden-pea selection has as its objective the raising of pure lines of the commercial varieties. The 1928 seed was collected from several sources in New Zealand. This was sown and single-plant selections made. When these single-plant selections were grown the following season (1929-30) it was very obvious that a considerable variation in type existed and that merchants had different ideas as to what constituted the characteristics of certain of our well-known varieties.

In the seasons 1929-30 and 1930-31 these selections were grown, and the bulk eliminated on account of variation in type, tendency to revert, disease, and such factors as these. In the latter season the selections were reduced to about two of each variety, and were grown at Palmerston North to relieve the tension at Ashburton farm, where suitable facilities were not available.

This past season a few seeds of each selection have been grown on netting to allow more critical observation, and the balance in increase blocks. An attempt has been made to select a line of each of the thirty varieties that is typical. This has been very difficult in some cases, and it will be interesting to see whether the merchants will accept these types for their trade.

Notes have been taken of all varieties. These will be supplemented next season, and it is hoped that we shall then be in a position to publish type descriptions of varieties and comments on their adaptability for New Zealand conditions.

The present position is that we shall thresh about 10 lb. of each selection. It is hoped to increase this next season and to invite merchants to view the trials. If they are satisfied with the strains, and feel disposed to give orders, we shall then multiply those they have selected and make delivery in due course. If merchants are not disposed to handle these lines, further work is not warranted. There seems to be no purpose served in distributing them to individual farmers, since the great bulk of seed is grown on contract.

FIELD PEAS.

A commencement was made in 1928 when samples were collected from various sources. From this material single-plant selections were made and sown out in 1929-30. This season those selections remaining from the 1929-30 season have been planted on netting at Palmerston North and carefully observed. Increase plots have been grown at Ashburton.

We observed this season: 31 selections of partridge peas; 29 of Harrison's Glory; 14 of Marrowfat; 20 of White Ivory; 20 of Small Blue; and 20 of Large Blue. In addition we grew and observed commercial lines introduced from Tasmania.

Observations have been very greatly hampered by disease. Virus, collar-rot, and fusarium have all tended to upset observation, and it has become exceedingly difficult to be certain whether the early maturity of a selection has been due to genetic or pathologic influence. Moreover, the nomenclature has offered difficulties. The names used are trade terms, and may embrace one or more varieties.

Generally speaking, there is little variation in partridge beyond that of maturity, and about this factor we cannot be certain. Only one variant has been noted, and since this seems to possess many features of interest it will be studied more fully. Partridge is the most important field variety in New Zealand. It overshadows all others, and warrants considerable investigation. The other varieties all show variations. Those that are obviously not true have been discarded this season, so also any showing weakness in other directions. From those remaining it should be possible, during the next few years, to isolate the most productive types and bring these in to replace the mixtures that are grown at present.

The present position is that we have about 6 lb. to 10 lb. of each of the selections, and the bulk of this seed will be held pending further trials and observations.