

VARIETIES OF ROOT CROPS

Prepared by the Canterbury Agricultural College, Lincoln

The area devoted to root crops in New Zealand is in the neighbourhood of 400,000 acres. In the 1937-38 season there were 373,500 acres of swedes and turnips and 8250 acres of mangels. Most of the seed for these crops is imported and numerous strains, developed by different English seed merchants, are offered to the New Zealand grower who has little to guide him in his selection. Definite advice for all circumstances cannot be given because reliable yield data for different districts are not available and because the existing strains are continually being changed or replaced by new and improved ones. The consequence is that yield data, where collected, may easily be out of date in a short time. In spite of the paucity of such data there is useful information which has been published in the journal of Agriculture, by the officers of the Department of Agriculture and by the Agronomy Division of the Scientific and Industrial Research Department. This information, as well as the results obtained from trials at Lincoln College, has been used in the preparation of this Bulletin and may help the grower to narrow down the selection of those varieties which give fair promise of success in this district.

A—SWEDES

Swedes contain about 12 per cent of dry matter. They are grown successfully where the rainfall or soil moisture is abundant. For these reasons they are more popular in Southland, Otago, parts of South Canterbury and in the high rainfall districts in the North Island than in the drier districts of Canterbury and the East Coast of the North Island. Diseases such as clubroot and dry rot in the wetter districts and insect attack in the drier districts are responsible for consider-

able damage to the crops. (See Bulletin No. 45). When healthy crops are grown heavy yields of roots which keep well into the spring are secured.

The more common varieties fall into the following groups:—

(1) Garton's Superlative, Webb's Masterpiece, and Success are similar types. Garton's Superlative is the most popular variety and is grown in all swede-growing districts. It is severely attacked by insects but at Lincoln in 1937 it proved to be fairly resistant to dry rot. This characteristic cannot be relied upon as in trials in districts of higher rainfall it has been reported to be very susceptible to this disease. It is very prone to clubroot. Webb's Masterpiece is indistinguishable from Garton's Superlative but is not so widely grown. Success is popular in Otago and Southland.

(2) Majestic, Grand Master and Tipperary are three varieties which are similar. Majestic and Grand Master are very popular in Taranaki and the Waikato while Tipperary is used extensively in Southland. None of them is very resistant to disease but good yields are secured from healthy crops.

(3) Sutton's Superlative and Magnum Bonum form another group. They are more globe-shaped than are the Garton Superlative group. The evidence suggests that the roots are larger, more severely infested by dry rot and less susceptible to insect attack than the first group. Sutton's Superlative is widely grown but not so popular as Garton's Superlative, while Magnum Bonum is mostly confined to North Island districts.

(4) Crimson King and Elephant. These varieties are popular in Otago, Southland, South Canterbury, and Manawatu. They are early and

stand well out of the ground giving high yields of roots and are susceptible to clubroot, dry rot, and insect attack.

DISEASE RESISTANT VARIETIES

The losses from disease in swede crops has been a major factor limiting the use of this crop but certain varieties for which disease resistance has been claimed have been introduced.

(1) Wilhelmsburger Ofofte and Benefactor are green top swedes which have proved to be highly resistant to clubroot. They are harder roots than the purple top varieties but his does not appear to affect their palatability. Where clubroot is a limiting factor they can be recommended with confidence. They keep well and the yields are good.

(2) Vilmorin and Sutton's Sensation. These two are white fleshed swedes of which Sutton's Sensation has proved the better type. It is one of the best yielders and is very resistant to insect attack. For these reasons the above varieties are becoming popular in the drier districts in Canterbury. The roots are very palatable but are fanged and this characteristic is responsible for a certain amount of unpopularity.

B—ABERDEEN OR YELLOW-FLESHED TURNIPS

Aberdeens are a hardy turnip containing about 10 per cent of dry matter. They are grown in colder districts. About 75,000 acres are grown in New Zealand, the greater area being confined to Otago, Southland, and the foothill areas of Canterbury. There are numerous varieties and they are subject to the same diseases as swedes. They mature more rapidly than swedes and keep better than soft turnips.

(2) Purple Top Aberdeen and Waite's Eclipse. These are typical of a group of purple top Aberdeens of which the Purple Top Aberdeen is by far the most popular variety. It is grown extensively in Southland, Otago, and Canterbury. It is a heavy yielder and keeps well but is not disease resistant. Waite's Eclipse is confined mainly to Southland and Otago.

(3) Green Top Aberdeen, Foster-ton Hybrid and Dale's Hybrid are a group of green top Aberdeens of which Green Top Aberdeen is the most popular, being nearly as extensively grown as Purple Top Aberdeen. These varieties are consider-

ed to be somewhat later than the purple top group, are good yielders and keep well.

(4) Romney Marsh and Centenary have mottled green tops. They are much less popular than the Aberdeens and are not considered to be such good keepers though they yield well.

DISEASE RESISTANT VARIETIES

Two varieties resistant to clubroot have been introduced. The Bruce is a purple top Aberdeen which has proved itself to be a high yielding and palatable turnip and is definitely resistant to clubroot. For this reason it can be recommended for districts where the disease is serious. The Wallace is a green top Aberdeen indistinguishable from other green top Aberdeens except by its resistance to clubroot.

C—THE SOFT OR WHITE-FLESHED TURNIPS

The soft turnips contain about 8 per cent of dry matter. They are grown chiefly for early winter feed but are also used for summer and early autumn feed for dairy cows. They grow more rapidly and have poorer keeping qualities than swedes or Aberdeens but they can be grown on much lighter land. They are extensively used in Canterbury, Otago, and Southland and in the drier parts of the North Island. There is a wide range of varieties which differ in earliness and keeping quality.

(1) Purple Top Mammoth is the standard early variety. It is a high yielder but has low keeping qualities. It is grown extensively in Southland, Canterbury, and the North Island. Lincolnshire Red and Red Paragon are slightly later than Purple Top Mammoth and are popular in Canterbury, Otago, Southland and the East Coast of the North Island.

(2) Imperial Green Globe and Hardy Green Globe are the latest and best keepers of the soft turnips. Their keeping quality is little below that of the Aberdeens and they are quicker growers. Their rapid growth renders them less susceptible to insect attack than are swedes and Aberdeens and it is for this reason they are more popular on the Canterbury Plains and on the East Coast districts of the North Island.

(3) Early Six Weeks is an example of a white-top turnip. As its name indicates it is very early and

is useful for early autumn sowing on stubble land. It is almost entirely confined to Canterbury.

No varieties of soft turnips available commercially in New Zealand are resistant to clubroot or dry rot, but since they are grown for early winter feed there has not been the same need to develop resistant varieties as is the case with swedes and Aberdeens which are slower growing and which are expected to keep longer into the winter or spring. Immune is a new Swedish variety which is resistant to clubroot but under New Zealand conditions it does not behave as well as the green globes.

D—MANGELS

To produce high yields mangels require warm soil and good summer rainfall. They will, however, withstand drought conditions better, are not subject to serious diseases and are more reliable than other root crops. As with swedes and turnips most of the seed is imported and numerous varieties are offered to growers. The differences in yield of dry matter per acre between the more common varieties are influenced by climatic conditions and soil fertility. Thus the Long Red varieties thrive under moist fertile soil conditions while the globes will outyield the long reds on lighter soils and under dry conditions. There is considerable variation between the different strains as the table printed at the foot of this page, which gives the relative average yield of dry matter per acre of a number of varieties grown under trial at Lincoln College, a relatively dry land district, during 1937-38 and 1938-39 seasons will show.

(1) Yellow Globe. This variety includes the strain "prizewinner." There is a wide range in yielding capacity of the different strains in the two years during which the

trial was conducted. Sutton's Prizewinner was the highest yielder in Lincoln College trials. In 1937-38, which was a wet summer, the long reds outyielded Sutton's Prizewinner by 10 per cent but in 1938-39, which was a dry summer, Sutton's Prizewinner yielded 15 per cent more than Long Reds.

(2) Orange and Lemon Globes. These varieties are uniform in yielding capacity, they are heavy yielders and appear to be little inferior to the best of the yellow globe varieties.

(3) Red Intermediates. This variety does well on deep moist fertile soils. The individual roots are quite large and more regular in shape than are the Long Reds.

(4) Long Reds. This variety will give its highest yields on deep soils which are moist and fertile. As indicated above, in the wet summer of 1937-38 they outyielded the best of the globes by 10 per cent but under the dry conditions of the 1938-39 season they were below the globes in yield.

(5) Tankards. The Tankards are a small mangel and the yield per acre is considerably below that of the other varieties but the higher percentage of dry matter compensates in some measure for this lower yield. Even so the net yield is generally below that of the better strains of globe or Long Red varieties.

Conclusion

The varieties of roots sown should vary according to particular conditions as affected by such factors as soil, climate, and presence or absence of diseases. By making a wise selection of variety as indicated in this bulletin a grower can enhance his chances of securing a reliable crop.

Variety	Relative average yield	Number of strains tested	Range of yield
Yellow Globe	82.7	6	68.2-100
Orange Globe	93.0	3	89.2- 98.5
Red Intermediate	80.0	3	72.0- 87.0
Long Reds	88.5	4	75.0- 97.0
Tankards	72.7	2	63.0- 82.0

Copies of this bulletin may be obtained from the secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.