

The Goal of Modern Vegetable Growing

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THE growing of vegetables is recognized as increasing in importance year by year. By the use of vegetables we get the highest yield of human food from the soil, not entirely from the nutriment they contain, but mainly from the quality they possess of rendering more digestible the proteins and carbohydrates of other constituents of our food. The rapid growth of our cities and towns, which are mostly without big gardens, makes truck farming very profitable with good paying crops.

The providing of the vegetable grower with seeds is surrounded by many difficulties—witness the recently issued volume for 1913 of the Canadian Seed Growers' Association. One of the remedies for the improving of these conditions is the selection of seed. Of course the breeding of seeds for the improvement of crops is a very intricate and expensive work, e.g., the quantity of seed produced in relation to the area is often very small, this in part causes the expense. Again, foreign competition, climatic and technical difficulties, not to mention the great labor problem, make the vegetable seed raisers path one of many tribulations.

Seeds to produce improved crops can be raised in different ways. One of these is by mass selection, which means the selecting of the best plants and fruits from a crop and saving them for seed. The seed from these best plants are mixed and sown and the same process goes on from year to year. This method is defective inasmuch as a plant may be superior to its neighbors but only because it had specially good conditions of soil, light, water or protection, not because it has an inherited superiority.

INDIVIDUAL SELECTION

Individual selection is the selecting of single plants, saving the seed therefrom and planting the progeny under conditions which gives each plant the same advantages. The seed from the best plants is then saved and kept separate. The process goes on as long as the investigator likes. In mass selection you cannot guarantee that you have picked out the best, you only think so. In individual selection you are in a position to be sure. You can apply accurate tests to prove it. One is a hit or a miss; the other gets a bull's eye every time.

These methods are generally used in animal breeding. Ordinarily a sheep farmer will let his ram run with a number of ewes. The resulting lambs may be likened to the plants selected in the mass. When the same farmer wishes to produce something which shall do him credit he picks out a specially good ewe and his best ram and breeds from them.

The lamb or lambs may be likened to individual selection in plants in this case. The parentage is known and when the same thing goes on for generations the final results are infinitely superior to those obtained by the first method. When a farmer wishes to test his herd of cows for milk production he treats all exactly alike, gives them the same water, food and shelter. The product from each is noted separately and after deducting the expense of production, he soon finds which cows are profitable. This is individual selection for milk—similar to what should be done in plant life. If the farmer fed some of his cows well, housed them well, and ill-treated others, afterwards testing the results he would or could only guess which was best. He would not be sure. This is similar to mass selection in plants. People should get firmly fixed in their minds that plants are living organisms, as responsive to treatment as animals, as amenable to improvement under certain conditions. The same laws of heredity rule in the vegetable and animal kingdoms.

SIMPLIFYING THE WORK

In order that the important work of breeding plants for improved seed production may be encouraged, the question of simplifying the work should be considered. This can be materially helped by the reduction in the number of varieties of each kind of vegetable. It is far better that the breeder and grower should devote their energies to the individual improvement of the present old varieties rather than be perpetually crossing for new varieties. With what a flourish of trumpets is a new variety introduced; what a plethora of adjectives are used to describe it and in a few years it is as dead as Queen Anne. It is better that improvement should take place along scientific lines.

What is recommended is that certain districts should grow only one or at most two varieties of the kind which can be grown successfully in the district. Then the breeders can proceed with their work knowing that their efforts can be controlled. Varieties of proved merit should be taken in hand and improved and one name given to each variety. This is another point which should be considered by those anxious to simplify matters. We often find that many names are applied to the one variety. Instead of breeders and growers frittering away their time on hundreds of different varieties, the differences only discoverable under a microscope (and often not then) they should come together and breed one good variety to a state of excellence. Two advantages would accrue by a dis-

trict devoting its attention to only one variety. First from the commercial point of view the crops would command higher prices, because by the formation of small associations transit charges would be reduced to a minimum. The district would become identified with the particular kind of vegetable specialized in. Instances of how this system has revolutionized numerous districts could be cited.

It would benefit such a district to grow its own seeds for two or three years, by the methods of individual selection mentioned before. One or more men supported by the association, should be in charge of the breeding of the stock seed, and after the neighborhood generally had a pure line of a certain vegetable, new seed from another pure line could then be introduced and in some cases could be used for crossing purposes. By having the district restricted to one variety a greater chance of obtaining a pure line in a short time is present.

The difficulties of a pure line breeder of any vegetable are very evident in a district where many varieties of one kind are grown. Cross fertilization when it takes place without knowledge is work of no value.

But the difficulties in the way of having specially trained breeders in each district would perhaps be too great to overcome. It would be a good thing to have breeding stations established in a few well-chosen centres supported by the government if private enterprise was unable to cope with the problem. These stations would be in charge of men scientifically equipped in every way, whose duty it would be to raise pure bred stock seed. These stock seeds could be sent to their respective districts where the vegetable growers could establish multiplying plots. From the plots the seed could be supplied for two or three years—not for very much longer as deterioration might set in. Then fresh stock seed could be procured from the station and the district could proceed as described.

The Glass Culture of Tomatoes

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The tomato crop, an illustration of which appears on the front cover of this issue of *The Canadian Horticulturist*, was benched last August, started fruiting in October and finished in January. The plants were trained to a single stem. We used twine and tied them to an overhead wire for support. The plants were set twenty by twenty-four inches. We find that three pounds to the plant is a very good average for this season of the year. The growers who get less than that are more plentiful than those getting that, let alone more. The house shown is one of our sixty-five by two hundred foot houses. The photo was