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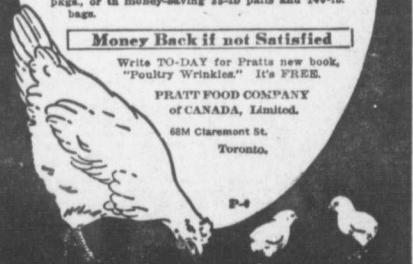
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Why Northern Grown Seed Potatoes Increase Yields

Physiological Diseases Lower Yields in Old Ontario. Immature Seed Potatoes Give Best Results. By Justus Miller, Assistant Commissioner of Agriculture for Ontario

THE superiority of Northern Ontario potatoes is due, we believe, to three factors. The first of these is found in the peculiarly favorable climate that prevails in the North. The natural habitat of the potato was found in the high plateaus in Colorado and Peru. The characteristics of the climate prevailing in these districts are: long growing days of sunshine, cool nights, abundant moisture and heavy dews are the rule, and drought. Under such conditions the potato has been proven to thrive best. In Northern Ontario these conditions are prevalent. Severe heat and drought, which arrest the growth and lower the vitality of potatoes, are very uncommon, while abundant rains and heavy dews are the rule.

Physiological diseases, which are becoming all too common in Old Ontario, are hardly known in the north. Leaf Roll, the worst of these diseases, was not found in a single case during a lengthy investigation conducted in Northern Ontario in the summer of 1917. Curly Dwarf is not noted either. Mosaic, a bad disease, but less serious than leaf roll, was encountered to a small extent, but in a very few cases was the percentage of diseased plants large.

These diseases are all hereditary. Their action is to stunt the growth of the plants and reduce the size and number of the tubers. If tubers from plants affected with these disease are planted, the disease will exist in the resultant plants in a still more aggravated form until in the third or fourth generation the plants will be very small and stunted and the crop of marketable potatoes produced by them almost nil.

From experiments conducted by P. A. Murphy, who has charge of potato disease investigation work in Canada, it would appear that these diseases are also communicable. Just how they are communicated is not known, as no organism has been found which causes them. It is thought, however, that enzymes of the diseased plants contaminate healthy plants immediately adjacent to them. It is generally believed that the diseases are produced by prolonged drought or other unfavorable conditions which produce the degeneracy noted.

Whatever the cause, however, it has been abundantly proven that these diseases are about the most serious obstacle which the potato grower has to face. As an example, a number of experiments conducted in Nova Scotia may be cited. Several lots of potatoes were planted in this experiment, some from healthy and some from diseased stock. Where 100 per cent. healthy seed was used, the yield of the rate per acre from 35 to 46 bushels of marketable potatoes. Where no leaf roll was present from 226 to 249 bushels of marketable potatoes were secured per acre. Intermediate percentages of leaf roll give yields varying between these two extremes very nearly in direct proportion to the amount of leaf roll present. As a general result of these experiments it may be taken that for each per cent. of leaf roll present in the crop the yield of marketable potatoes will be reduced 1.24 bushels per acre.

Must Secure Clean Seed. It is believed that these diseases can be communicated to healthy plants and they are certainly transmissible. The best authorities, both in Canada and United States, agree that it is practically impossible to control these diseases in a district where they are well established by selection. The only safe remedy is to use seed from a district where they

have not become established. This district, so far as potato growers in Old Ontario, would logically seem to be Northern Ontario, as has already been explained, physiological diseases have not yet become established to any extent in the North, and owing to the climatic conditions it does favor the development of such diseases, it is doubtful that they ever will become a menace to the potato industry of the North.

The third factor which makes Northern Ontario particularly adapted to the production of high-class quality of seed potato is the immaturity of the seed in these districts which is found. That immaturity increases yields can hardly be doubted in view of scientific experiment and practical experience which would seem to prove the point. On the Central Experimental Farm at Ottawa the factor of immaturity was emphasized in an experiment for the way last summer. In 1916 Professor W. T. Maconn, Dominion Horticulturist, conducted an experiment with potatoes of three different types of soil—sand, clay and muck. The potatoes planted on the muck happened to be near the boundary of the farm and Professor Maconn discovered, early in the season, that the potatoes were stunted. To preserve uniformity in his experiment he had the three lots dug in August. This immature seed planted in 1917 gave astonishing results, yielding very much more than mature seed of the same variety and planted on the same soil.

Immature Seed in Old Ontario. At a conference of potato experts and practical growers held in Toronto in October, 1917, this question was given thorough discussion and it was generally agreed that the seed of immaturity of seed very greatly increased yields. At that meeting Mr. Walter Cook, of Cataract, explained that in 1917 gave astonishing results, yielding very much more than mature seed of the same variety and planted on the same soil.

In Northern Ontario, owing to climatic conditions, the seed, while growing to large size, very seldom matures. This factor of immaturity is thought to be one very important reason why Northern seed, when planted in Old Ontario, gives such outstanding results.

In a series of experiments conducted for five years, Dr. C. A. Zavits of the Ontario Agricultural College, has proven the relative merits of seed potatoes of different varieties. In New Brunswick and Old Ontario. The seed from these different sources was planted side by side on exactly the same soil. The yields last year were 350 bushels, 313 bushels and 230 bushels respectively, and these results may be taken as representative of the five years' operation.

In Nova Scotia an investigating committee found but six per cent. of serious disease and practically no physiological disease at all. In each of the three districts in Old Ontario that they visited they found a very great amount of all kinds of potato diseases and an alarming amount of physiological disease in each case. Altogether the discoverers at an average of 23 per cent. of serious diseases in these three older counties. Moreover, the Northern crops were more vigorous and produced larger yields.

A Coming Agricultural District. While large districts in the North are not yet cleared, it is one of the great coming agricultural districts of

America. This has 40,000 acres of soil, a country already in thousands of heavier mature potato growing example of the following it means that four years William and P. Bay district where the adjacent now supports to Ontario of 140 bushels. If growers in Ontario convince of planting Northern are willing, by the use of seed production Ontario can be to supply all the of the Province.

In order to secure of a strong Northern Ontario also the plantings seed by growers Northern Ontario has made certain of assistance this to be used purposes are being from New Brunswick—a total north of 1,700 bushels. Northern Ontario has made certain to secure the quantity wanted quality, by the Department farmers will be given the auspices of Union. Some 10, who are taking part. Fairs will also reduce. In every county the district proposed demonstration value of seed. Brunswick, New Brunswick in Old Ontario. By acres of potatoes the Ontario Department Government ownership Ontario production stock of all growers.

Good Seed for C Besides this, it is to some extent in Northern growers. It has been arranged Brunswick of the Green Mountain variety to freedom of disease Government, are to growers in Northern seed will be distributed farmers in three or potato producing seed as in Old Ontario. It has been arranged who wish to buy quality of the Green New Brunswick variety. This seed was inspected in the growing condition, was inspected in the bin and in the spring before Farmers and farmers therefore, who wish potatoes in car load at a reasonable price. num of work on the

Next summer the Department has made a staff of inspectors to make a survey of Old to determine the exact of as they exist. Other work in the North, raw which result from the year shipped in this year also other fields of this reasonably free from variety. By this should be definitely badly Old Ontario change of seed and by vision will have been ample supply of first-class in New Ontario.