

Evidence of Improvement in Farm Crops by Selection*

From the latest census report for the Dominion of Canada we learn that for the year 1901 no less than 19,725,016 acres of land were used for the production of field crops. The estimated value of the farm crops for the Dominion for that year amounted to \$194,953,420. These figures show us the great value of the farm crops of our Dominion. It will be seen that even a slight increase in the yield and in the quality of these crops would mean a large increase in the total value of the productions of the country as a whole. It is well, therefore, for the Canadian Seed Growers' Association, the Agricultural Colleges, the Experimental Farms, and all other available agencies to put forward their best endeavors to bring about improvements in our crop productions. In the paper here presented I shall confine my remarks almost entirely to experiences obtained and observations made in Ontario and particularly in connection with the experimental work of the Ontario Agricultural College and of the Ontario Agricultural and Experimental Union.

SELECTION OF CROPS

Great care should be exercised in the selection of those classes of farm crops which are likely to give the best results. The selection of crops is necessarily governed to a great extent by the location of the farm, the quality of the soil and the particular kind of farming which is being followed.

In a study of the reports of the Bureau of Industries of Ontario and of the results obtained through the medium of the Ontario Agricultural and Experimental Union as well as by the results of tests made at the Ontario Agricultural College, we obtain some interesting information in connection with the relative production of some of our leading grain crops. In the following table we present the average yields in pounds of grain per acre of barley, oats, peas and spring wheat, in four separate columns. The first two columns to the left give the results obtained through the Bureau of Industries for Ontario for the past twenty-three years, also for the past three years, and the two columns to the right give the results of experiments made for three years in connection with the Experimental Union and the Experimental Department of the Ontario Agricultural College:

VARIETIES.	Ontario Ex. Union O.A.C.	19 yrs.	3 yrs.	19 yrs.	3 yrs.
Barley	1,301	1,384	1,856	2,714	
Cs. s.	1,217	1,319	1,758	2,634	
Peas	1,170	1,128	1,604		
Sp. Wheat	942	1,082	1,183	1,716	

It will be seen from the figures here presented that barley came first, oats second, peas third and spring wheat fourth, in every instance. It is interesting to note that the area devoted to the growing of barley in Ontario has increased very largely within the last five years; even more largely than that of any other farm crop grown in the province. This increase is due to several causes, among which might be mentioned the development of the live stock

industry and the introduction of improved varieties of barley, more particularly the Mandscheuri, of which there is probably half a million acres now grown in Ontario annually.

SELECTION OF VARIETIES

The writer is convinced that the proper selection of varieties of farm crops is of great importance. Each farmer should endeavor to find out which kinds of field crops are the most suitable for growing on the soil of his own particular farm. This information can be obtained by observing the results on neighboring farms, by studying the reports of the Experiment Stations and by definite and systematic experimental work by the farmer himself. So thoroughly are the farmers of Ontario becoming convinced of the importance of



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studying these matters for themselves that upwards of 4,000 are now carrying on co-operative experiments in connection with the Experimental Union.

As a few varieties of farm crops have now been under test at the Ontario Agricultural College for a period of fifteen years, it is interesting to note the comparative results of a few varieties. The records show that for the past fifteen years the average annual yield of grain per acre of the Mandscheuri barley was 11.7 bushels more than that of the Mensury barley, that the yield of the Siberian oats was 16.7 bushels per acre more than that of the Black Tartarian variety, and that the yield of the wild goose spring wheat was 9.1 bushels per acre more than that of the Colorado variety. As great differences exist between different varieties of grain crops in length of straw, strength of straw, susceptibility to rust and quality of grain as well as in yield per acre, it seems unnecessary to say more regarding the importance of variety in crop production.

SELECTION OF PLANTS

In the spring of 1903, 8,939 of the best seeds available of each of seven leading varieties of barley, oats and spring wheat were planted separately in our experimental grounds. Of this number 2,739 were planted in squares one foot apart and 6,200 were planted in squares one link apart each way. As each seed was planted by itself and at an equal distance from the surrounding seeds, an excellent opportunity was afforded for studying the characteristics of the various plants of each variety. It is scarcely necessary to say that there was a great variation in the individual plants. For the sake of illustration, reference is here made to the Mandscheuri barley. Of this variety there was a variation all the way from one head to twenty-eight heads per plant. The average number of heads per plant of this variety was 11.8, where the plants were one foot apart. At harvest time a number of the very best plants were selected with the object of starting new strains of this important barley. In the spring of 1904 the best seeds were taken from the selected plants and were sown in rows allowing one foot between the rows and also between the plants in the rows. On a careful examination of the crops comprising the different rows grown in 1904, it was found that the average number of heads per plant was 16.6, thus making an increase of 4.8 heads per plant, or 40.7% in one year. Some of the similar results were obtained with the other varieties of crops under investigation.

SELECTION OF SEED

A large amount of experimental work has been conducted at the Agricultural College within the past fifteen years in the selection of seed of various kinds of farm crops. Some of the most important results obtained are here referred to very briefly.

Maturity of Seed.—Much has been said in regard to the proper time of harvesting crops in order to get seed which will give the very best returns. In the average results of fourteen tests conducted within the past seven years we found that seed taken from winter wheat which was allowed to become very ripe before it was cut, produced a greater yield of both grain and straw, and a heavier weight of grain per measured bushel than that produced from wheat which was cut at any one of four earlier stages of maturity. The results of this experiment tend to show that with winter wheat at least, it is wise to select seed which has become thoroughly ripened before it was harvested.

Plumpness of Seed.—In order to ascertain the comparative values of plump and shrunken seeds, a large number of tests have been made at the college within the past eight years. Fresh seed has been taken each year from the general crop of grain grown in the large fields. It will therefore be understood that whatever difference there is from the influence of the selection of seed, that difference is attributed entirely to the careful selection of seed in the separate years in which the tests were made. For the large, plump seed none but well developed seeds were selected and for the shrunken seed, none but shrunken grains were selected, the last selection being made regardless of the size of the kernels. From the selection of large, plump seed exactly one-half pound was taken for each class of grain

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