

eration. In this, nature's aims are for the benefit of the plant rather than for the benefit of man. If wheat or oats be grown under conditions where the individual plants have to fight for their existence on account of weeds and a poorly cultivated soil, the plant will adjust itself so as not to form more heads or more kernels in the head than it is able to fill and mature. But man has at his disposal the means to improve on nature's methods much to his own advantage.

The best and dairy breeds of cattle have been improved by feeding, breeding and selecting the best from the best of each succeeding generation. It is true that if the system of selection be not kept up with improved breeds of live stock, the improved herds will rapidly deteriorate and become less profitable to the farmer. It is likewise equally true that if our grain crops do not receive reasonable care in the matter of cultivation and selection they also will become 'run out' and less profitable.

By selecting the best from the best from generation to generation, the sugar beet has been improved until the sugar content has been raised from 9 to 15 per cent. Vilmoren, of France, commenced the work of selecting sugar beets three generations ago. He selected first the sugar beets of the desired type and from these he cut out a small piece and determined their percentage of sugar. On his breeding plot he transplanted and saved seed only from those mother beets which contained a high percentage of sugar.

Vilmoren also commenced to grow and select wild carrots seventy-four years ago. We have reaped large benefits from his skill in the improvement of our cultivated carrot, which is now quite largely grown all over Canada as a vegetable and stock food. We also have with us the original wild carrot, which is a common weed in many districts in Canada.

In the spring of 1893 Prof. Zavitz of the Ontario Agricultural College, Guelph, commenced the work of selection of seed with a variety of oats known as 'Joanette Black.' A quantity of large, plump, black oats and an equal number of oats that were lighter in weight and lighter in colour were selected by hand from a bulk lot that grew in a field on the farm. Each of these two selections were sown on plots that were uniform in quality and size. Selections were made in each of the following years from the product of each of the two plots of the preceding year. That is, large plump, black oats and the oats that were lighter in weight and lighter in colour were selected from the crop produced from similar seed the previous year. The selection of the large, plump kernel year after year made for the gradual improvement in the yield and quality of the crop, while the influence from the selection of the kernels that were lighter in weight and lighter in colour tended in the opposite direction. At the end of twelve years there was a difference of twenty-six bushels per acre in favour of the crop from the large, plump seed, which also weighed ten and a half pounds per measured bushel more than the grain produced from the lighter seed. Here indeed is an illustration of the difference there may be between two strains of seed of the same variety.

The seed of Red Fife wheat and Banner oats grown by Messrs. A. Mackay, of Indian Head, and S. A. Bedford, of Brandon, has the capacity to give a much larger yield of grain than the seed of the same varieties that is sown on the average of farms in western Canada. The strains of seed grain of varieties that were obtained ten or twelve years ago are much improved to-day to what they were when first sown on the experimental farms.

Much more evidence could be given to show that the farmers in the grain growing districts in the west may adopt practical means by which they can increase the yield and improve the quality of their crops of wheat, oats and barley; and that without proper care in the growing and selecting of seed the yield and quality of cereal grains will depreciate from year to year. One other illustration, however, may suffice.

The State Department of Agriculture for Illinois co-operated with some of the leading corn growers in the formation of a Corn Breeders' Association. The members of this Corn Breeders' Association keep accurate records of the yield of corn from their breeding plots or small fields, on which they do the work of special selection in