A Western Canada Wheat Field.

Improving Wheat by Selection

During Royal Show week, at the Farmers' Club, London, Eng., Mr. A. D. Hall, now connected with the Rothamsted Experiment Station, read a very valuable paper on "The quality of English wheat." Attempts have been made to introduce our Western hard wheats, such as Manitoba No. 1 hard, into England, in order to strengthen the quality of home grown wheats. These attempts so far have not been altogether successful, as the following extracts from the address show:

"However, it cannot be said that any of these wheats provide material which can be recommended to English farmers. For spring wheats especially on light soils, Red Fife will probably crop as well as any English variety of Spring wheat, and in seasons like the past, when in many cases men wanted to sow wheat late in March, they could not do better than obtain some No. 1 Hard Manitoba, which consists almost wholly of Red Fife wheat. Several reports have reached us as to the good returns from growing Manitoban seed; without doubt it is the best graded wheat to try here both Northern and Kansas giving inferior results.

"Valuable as the results obtained with these foreign wheats may be, none of them supply the wheat for which we are looking. The English farmer might obtain an extra 2s. per quarter for growing them, but on the whole he would lose money, because of their deficient yield and shortness in straw. The important thing, however, is to notice that they retain their strength under English conditions, that their strength is inherent in the variety and not simply due to climate and soil. Strength then being a factor proper to the variety (and the differing strengths of English sorts also show this) it is a quality upon which the breeder can work, which can be raised by breeding and selection, just as surely as the proportion of sugar in beetroot, or the amount of wool upon a breed of sheep can be improved. The only hope for ultimate success lies in cross-breeding and selection; we must get some of the blood of these strong varieties associated with our English wheats, and then by selection we may hope to obtain a variety combining a measure of the strength of Red Fife with the cropping powers and good straw of sorts like Square Head's Master. For a long time now in raising new English wheats the yield has alone been considered, the wheats have been bred and selected for big, coarse berries and sturdy straw, without any particular attention being paid to the quality of the grain itself. In the future we must breed for strength in the grain, retaining, of course, the position previously attained with regard to crop and straw."

The important point for Canadians to note in this is the value placed by Prof. Hall on selection. His experience with growing Manitoba wheats leads him to the conclusion that, as these wheats retain their inherent strong qualities, when grown abroad, the plant breeder has something here to work on and can by selection and cross-breeding secure their qualities for their home grown wheats. This is additional evidence that the Seed Growers' Association, recently formed at Ottawa, is on the right track and capable of doing very much for Canada by seed selection.

In discussing Prof. Hall's paper, Mr. Martin Sutton, an English seedsman of long standing and experience, bore testimony to the value of selection, though he seems to have little faith in the value of cross-fertilization, as follows:

"After much experience of my own in cross-fertilization in other directions, and after watching the cross-fertilization of cereals abroad, I think I ought to tell you that, personally, I have not the slightest hope of any great improvement in our English cereals as a result of that process, at least for many years to come. To mention one difficulty alone, all of us know that to ensure an even sample of grain all the plants of which the crop is composed must ripen simultaneously. This is the result only of the growth of any variety for a long series of years during which any laggard, late ripening wheat plants have automatically been eliminated.

"Meanwhile, there is a far more practical method at our command, viz., the process of selection; and when I remind you that our agricultural roots are the result of selection rather than of cross-fertilization, and that our breeds of cattle originated as the result of the same process, you will, I think, be prepared to agree with me that it is probable more may be done by selection in the improvement of seed corn than in any other way."

A Wheat Hospital

In Port Arthur, Ont., there is what is known as a wheat hospital. A great deal of the wheat grown in Manitoba and the North West Territories is affected with smut. Smut is a disease that attacks certain kernels, changing the gluten and starch into a black dust, which, when the grain is threshed, adheres to the sound kernels and greatly depreciates the value of the wheat. The worst form is called "stinking smut" and effects the whole kernel so that it becomes a mass of germs, which absorb all the nutritive parts and reduce the kernel to a thin shell. When the shell is crushed, innumerable little spores appear, which emit a fetid smell and ruin any flour they touch. At this stage "smut" is incurable, and wheat affected by it cannot be rendered fit for human food.

But if the disease at this stage cannot be cured, the grain shipper has a way of cleansing wheat in which the kernel inside the brown skin is not infected, though the outside may be discolored by coming in contact with smut germs. The grain reaches Port Arthur in carloads and is there examined by a government inspector. If found to be suffering from smut, it is separated into three grades, according to the amount of smut adhering to it. That which is least dirty is scoured and brushed until all vestige of smut is removed, while the dirtier grain is thoroughly washed and dried before being cleansed. The scouring machine turns and tosses the wheat so vigorously that every grain becomes highly polished, and is said to be in better condition for milling than ordinary wheat, since it has lost part of its outer integument, which would have to be removed. It is believed the "wheat hospital" has saved many thousands of dollars to the farmers of Western Canada.

Any farmer or owner of grain may send it to the elevator to be treated, the charges being the same to every one for each particular operation. The capacity of the elevator has been increased from time to time. At present, 20,000 to 30,000 bushels can be dried in twenty-four hours, and from 40,000 to 100,000 bushels can be cleaned in the same time, according to the condition of the wheat and the amount of work necessary before it can be discharged as "cured" About 2,000,000 bushels are received and treated in a year.

While a great deal of good has been accomplished by this treatment, "prevention is better than cure." The way to prevent smut in wheat is to treat the seed with a formalin solution before it is sown. This plan has frequently been described in these columns. Western farmers should treat smutty seed before sowing.

To Improve Western Wheat

Mr. Jas. Murray, B.S.A., has gone to Winnipeg to take charge under Prof. Robertson, of the Western branch of the Canadian Seed Growers' Association. He is confident that if Western farmers take up seed selection as advised by the Association that a very great improvement in the wheat crop will be effected in a very few years.

About Sugar Beets

American capitalists contemplate the erection of a large sugar beet factory at Calgary at an estimated expenditure of $800,000.

Trustees have been appointed at Wiarton to receive the bounty from the Ontario Government and pay it out pro rata to the beet growers of the now insolvent Wiarton Sugar Company, entitled to it. Representatives from the beet growers, who met to appoint the trustees, in a resolution expressed their entire confidence in the beet sugar industry as a profitable and beneficial crop for farmers to grow.