NATURAL CROSS-POLLINATION IN WHEAT.¹

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INTRODUCTION.

The pure-line method of breeding has been almost universally adopted for self-fertilized crops. The initial selection is generally considered simply to isolate those types which are present in the commercial variety. Continuous selection in pure lines of self-fertilized crops has not, as a rule, given any improvement of importance, although a few cases are on record of a sudden change in a pure line which proved to be of selection value. Almost all commercial varieties of farm crops are mixtures of various types. Even though all plants are of the same general appearance, selection often isolates types which differ in such important things as yield and resistance to lodging.

As an illustration of the results of such selection, the production of Haynes Bluestem wheat, Minnesota No. 169, may be mentioned. Before the recent introduction of Marquis wheat, this pedigreed type was widely grown in Minnesota. Minnesota No. 169 was one of a large number of selections which were first tested at the Minnesota station in 1892. The initial selection was a single plant which gave progeny of promise and which, when tested in various parts of Minnesota, gave a marked increase as compared with the commercial types then grown.

Minnesota No. 169 is a hairy-chaffed, awnless wheat with red coloring matter in the bran layer of the kernel. An examination in 1915 of bulk seed of this strain showed the presence of some unpigmented or white kernels. These white kernels bred true to the Bluestem type of plant for other characters. Several samples of Minnesota No. 169 as grown by farmers were obtained in 1916 and were examined. Nearly all of these samples contained some white kernels which, when grown, proved to be similar to Haynes Bluestem in other characters.

If Bluestem wheat was originally pure for the red color of the kernel, which seems very likely, the question at once arises as to

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