THE COMMERCIAL USE OF DOUBLE CROSSED CORN IN MINNESOTA1

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The present method of corn breeding which has been universally adopted by experiment station workers is the result of intensive and extensive studies of the corn plant. The mode of attack was initiated about 1906 by East at the Connecticut Station and by Shull at Cold Spring Harbor. It consisted of the continued self-fertilization of individual plants within a line and a study of the biotypes which could be isolated by this means. After studying the field appearance of lines of corn which had been selfed for 6 years, a well-known botanist asked the author in 1912 if he thought it possible to continue inbreeding indefinitely without a continual loss of vigor in the inbred lines. This question emphasizes the changed viewpoint brought about by genetic studies.

Extensive studies of crosses of inbred lines have been made. \( F_1 \) crosses between inbred lines proved much more vigorous as a rule than the inbred lines and in some cases more vigorous than the normal variety from which the inbred lines were obtained. Shull in 1910 predicted that some method of hybridization would be used eventually by the producer of corn seed.

The large number of genotypically different inbred lines that could be obtained from a variety and the many and striking abnormalities which are present within inbred lines were recognized by all workers. This has led to extensive selection studies and to the general use of a terminology suggested by D. F. Jones known as “selection within self-fertilized lines.” A description of the method by Jones was of great aid in creating a wide interest in this plan.

Even today the number of lines of corn which can be studied with the facilities available are less than are used for similar breeding experiments with other crops. In studies of wheat crosses at Minnesota for the production of stem rust resistant types, it is believed that from each cross which seems worthwhile an \( F_2 \) progeny of

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