THE VALUE IN HYBRID COMBINATIONS OF INBRED LINES OF CORN SELECTED FROM SINGLE CROSSES BY THE PEDIGREE METHOD OF BREEDING \(^{1}\)

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The utilization of inbred lines of corn in hybrid combinations has been studied extensively by many investigators. Most of the inbred lines used in these studies, however, have been obtained by self-pollination and selection from commercial varieties. Recently, Hayes and Johnson (2) and Wu (6) at the Minnesota Station have presented the results of breeding improved inbred lines by what was designated as the pedigree method of breeding. As the method was described in considerable detail in these earlier publications, it seems unnecessary to summarize here in great detail. Inbreds were selected from single crosses between inbreds obtained from commercial varieties. Each of the nine crosses from which inbreds were selected was made for the purpose of combining the desirable characters of the parental inbreds and after crossing selection in self-pollinated lines was practiced from F\(_2\) to F\(_6\) before the new inbreds were considered sufficiently homozygous to be ready for use in hybrids. During the segregating generations selection was made for ability to withstand lodging and for resistance to smut as well as for general plant vigor. Inbreds obtained by this method of breeding are much superior in ability to withstand lodging to those obtained by selection from Minnesota open-pollinated varieties. Before testing the new inbreds in single and double crosses they were tested in inbred-variety crosses with Minn. No. 13. Previous investigations (3, 4, 5) of inbred-variety crosses have led to the general acceptance of this method as a means of discarding lines of low combining ability.

The present study was made to determine the relation between the performance of inbreds in inbred-variety crosses and in single crosses. Since crosses were made also between lines of diverse as well as some-