A COMPARISON OF THE ACTUAL YIELD OF DOUBLE CROSSES OF MAIZE WITH THEIR PREDICTED YIELD FROM SINGLE CROSSES

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The first extensive study in corn of methods of estimating the yields of double crosses was made by Jenkins (4) who used the yields of single and top crosses in prediction. He concluded from this study that, “inbred variety crosses may be utilized to advantage in estimating the performance of double crosses among these lines.” One of the methods tested by Jenkins, called method B, consisted of averaging the yields of four of the six possible single crosses from any four inbred lines, not using in this average the two single crosses used as parents of a particular double cross. The predicted yields obtained by this method were no more highly correlated with the actual yield of the double cross than they were when the predictions were based on the yields of all six possible single crosses from four lines.

Doxtator and Johnson (2) later showed that method B could be used very well to determine which two single crosses, among four inbred lines, should be used as the parental single crosses in order to give the highest yielding double cross combination out of the three such possible double cross combinations. They demonstrated that some double cross combinations from the same four inbred lines yielded significantly more than others. Anderson (1) gave further proof that this method of predicting the yield of a double cross could be used to determine which double cross combination from four inbred lines would give the highest yield. He compared the actual yield with the predicted for 15 double crosses and obtained a highly significant r value of +.90.

From these results it was concluded that the predicted yield by Jenkins’ method B could be used as an estimate of the actual yield with a high degree of precision. This method has been used extensively at Minnesota since 1938 in making the first estimate of the yielding ability and period of maturity of double crosses.

The present study is a comparison of (a) the relative yields of selected double crosses based on prediction data by method B during one season and the performance of these same double crosses in later seasons, and (b) a comparison of actual yields of double crosses and their predicted yields from single crosses grown with the double crosses.