CROSSES BETWEEN COMMERCIAL VARIETIES AND SELFED LINES OF CORN HAVE BEEN TERMED TOP CROSSES, INBRED-VARIETY CROSSES, AND LINE-VARIETY CROSSES. TWO USES HAVE BEEN SUGGESTED FOR SUCH CROSSES. JONES AND LINDSTROM HAVE SUGGESTED UTILIZING THEM COMMERCIA LLY INSTEAD OF CROSSES INVOLVING TWO OR MORE INBRED LINES, AND SUCH A PROCEDURE IS BEING FOLLOWED TO A LIMITED EXTENT WITH SWEET CORN. JENKINS AND BRUNSON HAVE POINTED OUT THE POSSIBILITY OF USING TOP CROSSES AS A SIMPLE MEANS OF EVALUATING INBRED LINES FOR USE IN CROSSES. THEY REPORTED APPRECIABLE CORRELATIONS FOR THE YIELDS OF TOP CROSSES WITH THE MEAN YIELDS OF SEVERAL SINGLE CROSSES INVOLVING THE CORRESPONDING INBRED LINES.

IN PRACTICAL UTILIZATION, AN ADVANTAGE OF TOP CROSSES OVER THREE-WAY OR DOUBLE CROSSES LIES IN THE SIMPLICITY OF SEED PRODUCTION. THIS IN TURN REQUIRES THAT THE COMMERCIAL VARIETY BE USED AS THE SEED PARENT AND THERE ARE FEW CONDITIONS UNDER WHICH THE RECIPROCAL CROSS WOULD BE PRACTICAL. IN USING TOP CROSSES TO TEST INBRED LINES, ON THE OTHER HAND, A SIMPLE WAY OF OBTAINING SEED IS TO GROW AND DETASSEL THE INBRED STRAINS TO BE TESTED IN A FIELD OF THE COMMERCIAL VARIETY TO BE USED AS A POLLEN PARENT. A RELATIVELY FEW EARS CONSTITUTE AN ADEQUATE SAMPLE OF THE INBRED AND THE POLLEN FROM THE MANY PLANTS OF THE VARIETY PROVIDES AN EXCELLENT RANDOM SAMPLE OF THAT. IF INBREDS DIFFERING MATTERIALLY IN SEASON ARE USED, THE VARIETY SHOULD BE PLANTED ON TWO OR MORE DATES TO AVOID SELECTIVE POLLINATION OF EARLY INBREDS BY EARLIER TASSELING PLANTS AND VICE VERSA.

IF THE INBRED LINES AS THE SEED PARENTS THE QUESTIONS ARISE (1) WHETHER RECIPROCAL CROSSES OF INBREDS WITH A VARIETY ARE EQUAL IN GENERAL AND (2) THE EXTENT TO WHICH SUCH INEQUALITIES, IF ANY, ARE VARIABLE DEPENDING UPON THE INBREDS USED. IF THE RECIPROCA LS TEND TO BE ESSENTIALLY EQUAL, SEED MAY BE PRODUCED IN WHICHEVER WAY IS MORE CONVENIENT.

IF THE RECIPROCAL CROSSES ARE NOT EQUAL AND THE INEQUALITIES BETWEEN RECIPROCALS DIFFER SIGNIFICANTLY FOR DIFFERENT INBRED LINES, CROSSES MADE ON THE INBRED LINES AS SEED PARENTS MAY NOT GIVE A PROPER INDICATION OF THE RELATIVE VALUE OF THE PARENTAL LINES IN HYBRIDS. DATA BEARING ON THESE QUESTIONS ARE PRESENTED HERE.

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