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1. Inbred variation and hybrid performance.

Five to seven stocks of the same long-time inbred line for each of six inbreds were crossed to a common yellow or white single-cross tester. Comparisons at the same location of three-way testcrosses within the respective inbreds revealed significant differences between the hybrids in 9 out of 10 agronomic characters: yield, time of silking, ear height, plant height, stalk lodging, erect plants, ears per plot, dropped ears per plot, and leaf position. Grain quality was the only character in which no significant differences were obtained.

These results show a great amount of variation occurring within long-time inbreds maintained at different locations and in their hybrid progeny. Thus a hybrid produced with Inbred A from Texas may not give the same performance as the supposedly same hybrid produced with Inbred A from Georgia.

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2. Biochemical analyses used to differentiate lines of maize.

Biochemical analyses were used to differentiate stocks of the same long-time inbred line of maize in this experiment. Significant differences were found in the amounts of carbohydrates and amino acids in the stocks. The significance of these findings is to provide a biochemical tool for the geneticist to use in selection phases of breeding programs and in basic genetical work.

Seedlings of four stocks of the inbred CI 7 were compared biochemically for total carbohydrates, alcohol soluble sugars, and free amino acids. Apparently three sub-lines with different biotypes have evolved in the four stocks. In general, the stocks which had agronomic differences in a previous study also had biochemical differences in this study.

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3. Effect of Phosfon on growth of maize.

Phosfon is a chemical height retardant on certain plants such as Easter lilies, chrysanthemums, lima beans, seedling Jonathan apple and several other plants. The effect of Phosfon-D on a white single-cross tall hybrid corn,