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1. Effect of cytoplasm on agronomic characters in maize.

The cytoplasm in a double-cross corn hybrid is obtained from one inbred line, the female inbred in the seed parent of the double cross. The same genotypic yellow double, GAC 0211, was made with the four following sources of cytoplasm:

Female		Male
(GA 172 x GA 199)	x	(CI 21 x GT 112)
(GA 199 x GA 172)	x	(CI 21 x GT 112)
(CI 21 x GT 112)	x	(GA 172 x GA 199)
(GT 112 x CI 21)	x	(GA 172 x GA 199)

This investigation was made to determine if the cytoplasm affects agronomic characters such as yield, lodging, plant and ear heights, and date of silking. Paired one-row plots (15 hills in length) for the six possible cytoplasmic comparisons were used in a randomized blocks design with ten replications in 1957. Some preliminary results were obtained in 1952 and 1953 under extreme stress of drought.

The 1957 results show the following: Significant differences were obtained between the yields of GA 199 and GT 112 cytoplasms with 89.7 bushels and 82.7 bushels per acre, respectively. GA 172 had more erect plants than CI 21 and GT 112. GA 199 silked earlier than GT 112. CI 21 produced taller plants and higher ears than GA 172.

These results indicate a cytoplasmic effect on the inheritance of the agronomic characters--yield, erect plants, date of silking, plant and ear heights--in the double cross, (GA 172 x GA 199) x (CI 21 x GT 112).

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2. Heterofertilization and pleiotropism.

Several progenies of GT 112 are being maintained which show a 3 yellow to 1 "lemonade" endosperm color segregation. "Lemonade" kernels produce albino seedlings, except for a percentage of 1.45 which produce green seedlings. No albino seedlings from yellow kernels have been obtained. Thirty-six "lemonade" kernel-green seedling plants