

**COMBINING ABILITY FOR YIELD AND YIELD
COMPONENTS IN INFLUENTIAL
COTTON VARIETIES**
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Abstract

A great number of germplasm lines have been used as parents in cotton improvement. Those contributing a larger proportion of genes to modern cotton cultivars than other germplasms are called influential lines. The most influential lines from 16 cotton breeding programs were identified based on the analysis of the pedigrees of 260 cultivars released between 1970 and 1990. The objective of this study was to investigate general combining ability (GCA) and specific combining ability (SCA) for yield and yield components of some of these most influential lines. Ten Upland cotton varieties were selected for crossing in a half diallel. Parents and their 45 F_1 s were grown at Winnsboro and St. Joseph, LA, in 1997. Bolls in one square meter of each plot of three replications in each location were counted to calculate seed cotton yield, lint yield, and bolls/plant. Fifty well developed bolls were hand harvested from each plot to determine boll weight, lint percentage, lint index, and seed index. Highly significant GCA effects were detected for every trait investigated. This indicates important additive gene action for these traits among these ten influential cotton varieties. Lint percentage, boll weight, lint index, and seed index also showed significant SCA effects. None of these varieties had positive GCA effects for all of the traits. It suggests that these varieties might have only played a partial role in the development of modern cultivars. Stoneville 2, the most influential line, expressed negative GCA effects for calculated seed cotton yield, calculated lint cotton, lint percentage, bolls/plant, and lint index. These results are not consistent with the fact that it had the greatest genetic contributions to cultivars released during 1970 - 1990.