



## Combining ability of tropical maize lines for seed quality and agronomic traits

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**ABSTRACT.** Studies of genetic effects of early selection of maize based on seed quality traits are rare, especially those that use materials from different heterotic groups. These studies are also useful in tropical environments and for the advancement of sustainable agriculture with cropping during seasons not commonly used for cultivation. We estimated, through diallel crosses, the predominant genetic effects on the expression of agronomic traits and seed quality and on the general combining ability of nine maize lines from commercial hybrids and the specific combining ability of hybrid combinations among them. In the evaluation of seed quality, seven tests were used: first count and final count of seed germination, seedling vigor classification, cold tolerance, seedling emergence rate in a sand seedbed, speed of emergence in a sand seedbed, and speed of emergence index. Plant height, first ear height and grain yield were the estimated agronomic traits. In the diallel analysis, method 3 (model I) proposed by Griffing was used. There was a greater significance of non-additive genetic effects in the genetic control of seed quality of the various lines. The Flash, Dekalb 350 and P 30F80

lines combined high seed quality and high grain yield. For growth during the normal planting season, the combinations CD 3121-1 x P 30F80, Speed x CD 3121-2, Dow 8330 x AG 8080 and Dekalb 350 x CD 3121-2 were the most promising for both seed quality and agronomic traits.

**Key words:** *Zea mays* L.; Genetic effects; Seed quality tests; Grain yield; Early selection; Hybrids