DIALLEL CROSSES FOR IMPROVING FABA BEAN
(*Vicia faba* L.) UNDER RAIN-FED CONDITIONS
I. YIELD AND YIELD COMPONENTS

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The present study was conducted during 1998/99 and 1999/2000 seasons to estimate the types and relative amount of genetic variance components and their interactions with environments for yield and yield components in faba bean. A half diallel set of crosses involving seven parental varieties were utilized under two environments, normally irrigated every 45 days in addition to the amount of rainfall, and with second, dry method of sowing was, used and one supplemental irrigation at sowing, then after, plants were left to grow under rainfall conditions.

Significant genotype mean squares were obtained for all traits in both environments and in the combined data.

The ratio of Specific Combining Ability, S.C.A. x Environment/S.C.A. was higher than of General Combining Ability, G.C.A. x Environment/G.C.A. for all traits except number of pods/plant. The parental varieties Giza blanka and Giza-717 gave significant positive $\hat{g}_i$ for yield and one or more of its components in all crosses. The combination Giza blanka x Giza-461 and Giza-717 x Moshtohor-103 appeared to be the best promising for breeding to increase seed yield per plant which gave significant positive $\hat{S}_{ij}$ for yield and some of its component in both environments as well as the combined data.

Faba bean (*Vicia faba*, L.) is a protein crop for temperate regions. In Egypt, there is a possibility of increasing the cultivated area. Therefore, it is important to obtain higher yielding varieties through breeding programs for the new reclaimed areas under rain-fed conditions. The breeder should know the type of gene action of the quantitative traits because this is the main