

GENETIC ANALYSIS OF DROUGHT TOLERANCE ATTRIBUTES IN F1-CROSSES OF FABA BEAN (*Vicia faba* L.)

By

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ABSTRACT

The present investigation was conducted during 2000/01, 2001/02 and 2002/03 seasons to estimate the type and relative amount of genetic variance components and their interactions with environments for drought tolerance in faba bean. For these purposes, factorial mating design was used , where 5x5 line x tester analysis as outlined by (Kempthorne,1957) was used .

The results of 25 crosses and their 10 parents were arranged in two field experiments under normal irrigation and stress condition, each was grown in a RCBD with three replications. Highly significant mean squares of genotypes, parents and crosses were found for all drought tolerance attributes .Moreover, mean squares of lines and testers were found to be insignificant for most studied traits, Regarding lines x testers mean squares, its were highly significant for all studied traits under both environments.

The ratio of $\sigma^2_{gca} / \sigma^2_{sca}$ was less than unity for all drought attributes, indicating that non-additive genes played an important role in the inheritance of these traits. On the other side, the ratio of $\sigma^2_{gca \times IR} / \sigma^2_{sca \times IR}$ was less than unity for all drought attributes, indicating that SCA variance was more interacted with irrigation regims than GCA variance for these traits. No good combiner could be observed in the present materials for drought tolerant attributes, while the crosses; Giza Blankax x Ryouisia- issun, Giza Blankax Shimizu-issun, Bpl₇₁₀ x Shimizu-issun and LB₄₇₂₆ x Ohishima-zairai had positive and significant ($\hat{S}_{ij}$) for most studied traits under normal irrigation and the cross; Giza Blankax Shimizu-issun had positive and significant ($\hat{S}_{ij}$) for leaf area / plant, size of root and length of root and negative value reached to highly significant for leaf area under stress condition.