

Breeding behaviour of some characters in an Egyptian cotton hybrid

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Eight inbred lines descendant from the cross (Giza 83) I (line 22/80), in addition to the two parents of the cross were grown at seven locations, i.e.; Sakha, Bahtim, Giza, Sids, Maghagha, El-loussia and El-H1nshah in 1987 season. A randomized complete block design with six replications was used. The standard analysis of variance and stability of performance were made for each of the characters under the study. The results obtained could be summarized as follows:

- 1- The relative magnitudes of the genotype-environment interaction: Highly significant mean squares for environments were obtained for all characters. The genotypic differences were significant or highly significant for all characters under study except number of bolls per plant, seed cotton yield and lint yield characters. The mean squares of genotype-environment interaction were significant or highly significant for all characters except number of days to first flower, earliness percentage and the 2.5% span length. These results indicated that cotton as well as other crop varieties often showed different responses when grown under different environments.
- 1- The genotypic stability for different genotypes: The relative ranking of genotypes according to their mean performance over the seven environments was not the same for all characters. Lines 50/85 and 48/85 were the earliest and highest yielding among the other genotypes.
- iWI. In respect to genotype: 1- stability analysis. All of the characters (except, number of days to first flower, earliness percentage and 2.5% span length) show a component of variance (the part that is relatively unpredictable compared to linear response, A_{ij}) of the genotype-environment may be more important than the relatively predictable component (the linear response, $\bar{A}_{i.}$).
- II Estimations of genotypic stability revealed varying degrees of stability for the genotypes. This study shows that the most stable genotype over the seven sampled environments was line 63/85 which exhibited the highest number of stable characters, followed in a descending variety and lines 44/85, 53/85, 50/85, 22/80, 59/85, 48/85, Giza 83, and 61/85. Apparently, the lines with high mean value had below average degrees of stability, lines with poor mean performance had above average stability and lines with average mean performance showed average stability in this study. breeders are concerned does imply general constancy of phenotype in varying environments, but stability in agriculturally important characters (Allard and Bradshaw, 1964; Eberhart and Russell, 1966; Tai, 1971). Therefore, the genotypes 53/85, 44/85 and 50/85 which exhibited high yielding ability and were stable in one or more of the traits studied in the present investigation could be selected.
- III- Estimation of heritability and genetic advance under selection and genetic coefficient of variability. 1- High heritability value (over 50%) were observed for earliness/characters, boll weight, lint seed index, lint index and all of the fiber properties. The high heritability values were approximately, consistent for all the seven environments. Moderate heritability estimates, (from 30 to 50%), were obtained for number of bolls per plant. However, low heritability values (below 30%) were obtained for yield characters. 2- High expected genetic advance (over 7%) were observed for the position of first sympodium and seed index. Moderate genetic gains, (from 5% to 7%) were estimated for earliness percentage, number of bolls per plant, and micronaire reading. While, low genetic gains, (below 5%), were calculated for days to first flowering, yield characters, lint percentage, lint index and all the other fiber properties. 3- The genetic coefficient of variability was intermediate only for the position of first sympodium, however, it was small for the other characters.