

BREEDING FOR GRAIN YIELD, YIELD COMPONENTS AND QUALITY TRAITS IN YELLOW MAIZE (*Zea mays*, L.)

By

Sedhom S.A., Tag El Din, M. H., El- Badawy. M.E. and Abd El Bakey M.A.

Agronomy Dep. Fac. Agric. Moshtohor, Benha Univ.

ABSTARCT

A diallel cross system involving ten new inbred lines was used in this study to estimate heterosis and combining ability for growth, yield and yield components as well as quality traits in maize. The resulting 45 crosses along with two checks namely, S.C. 162 and S.C. 3084 were evaluated at Moshtohor and Munifiya locations. Significant genotypes mean squares were detected for all traits at both locations. The cross $P_2 \times P_5$ expressed the highest significant mean values for ear length, ear diameter, number of grains/ row, 100 kernel weight and ear grain weight in the combined analysis. The three single crosses highest $P_5 \times P_9$, $P_4 \times P_5$ and $P_1 \times P_3$ gave the highest mean values for carbohydrate, protein and oil %, respectively in the combined analysis. The single cross $P_2 \times P_5$ expressed highest heterotic values for grain weight per plant relative to both checks in the combined data. Significant mean squares due to both general and specific combining abilities were detected for all studied in the combined analysis. Also, high GCA/ SCA ratios which largely exceeded the unity were detected for all studied traits in the combined data except shelling % and carbohydrates % in the combined analysis. The mean squares of interaction between locations and both types of combining ability were significant for all studied traits except 100 kernel weight, carbohydrate %, protein % and SCA/ L for oil %. The parental inbred line P_1 expressed the highest significant positive ($\hat{g}_i$) effects for number of rows/ ear and oil %. The parental line P_2 was the best general combiner for grain weight/ plant in the combined data. The single cross $P_2 \times P_5$ expressed the best $\hat{s}_{ij}$ effects for number of grains/ row and ear grain weight in the combined analysis. The most desirable $\hat{s}_{ij}$ effects were detected by the crosses $P_3 \times P_{10}$, for carbohydrate % ; $P_4 \times P_5$ for protein %; and $P_1 \times P_3$ for oil %, respectively.

Key words: Combining Ability, Heterosis, Quality Traits, Maize.