DIALLEL ANALYSIS OF YIELD AND OTHER AGRONOMIC CHARACTERS IN MAIZE (Zea mays, L.)

BY

El-Hosary, A.A. and Sedhom, S.A.

Department of Agronomy, Faculty of Agriculture, Moshtohor, Egypt.

ABSTRACT

An 9x9 diallel analysis of combining ability under two different levels of nitrogen for eight quantitative characters was performed. Significant mean squares due to nitrogen levels were detected for, ear height, number of rows per ear, 100-kernel weight, and grain yield per plant.

Significant general and specific combining abilities (GCA and SCA) were obtained for all traits. The magnitudes of the ratios of GCA/SCA revealed that the additive and additive X additive types of gene action were the msot important expressions for all traits. The magnitude of the interaction for GCA was generally higher than for specific one for most traits. The parental inbred lines M.37, K64 and M.44 showed significant negative (g_i) for silking and tasseling dates. The parental inbred lines M.30 and RgII expressed significant positive of (g_i) for grain yield/plant, number of rows/ear and number of kernels/row. While, M.36 seemed to be the best combiner for grain yield, 100-kernel weight and number of rows/ear.

The highest desirable SCA effects were in crosses: RgII X M.36, RgII X M.25, RgII X M.30, K64 X M.54 and K64 X M.36 for grain yield and one or more of its components. The cross RgII X M.3 showed the highest useful heterosis for grain yield followed by RgII X M.30. The five double corsses; (RgII X K64) (M.36 X M.30), (RgII X K64) (M.54 X M.36), (RgII X K64) (M.36 XX M.25), (RgII X K64) (M.36 X M.24) and (RgII X M.36) (M.24 X M.30) surpassed the respective check variety D.C. 202 by 32.35%, 24.90%, 23.50%, 10.97% and 13.51%, respectively.