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شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

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شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

قسم

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بعض الوثائق الأصلية تالفة

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بالرسالة صفحات لم ترد بالأصل

ESTIMATION OF STATISTICAL GENETIC PARAMETERS AND COMBINING ABILITY IN MAIZE CROSSESUNDER DIFFERENT ENVIRONMENTS

BY

MOHAMED ABDEL-AZIEM HASSIB

B.Sc. Agric. Ain Shams Univ., 1992

A thesis submitted in partial fulfillment
of
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IN

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Faculty of Agriculture
Ain Shams University

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Date of Examination : / 6 / 1997

APPROVAL SHEET

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ABSTRACT

Mohamed Abd El-Azeim Hassib, Estimation of statistical genetic parameters and combining ability in maize crosses under different environments. Unpublished Master of science, Agronomy Department, Fac. of Agric., Ain Shams University, 1997.

This investigation aimed to study the effect of heterosis, combining ability estimates and correlations among yield and its attributes under six different environments in maize. Eight inbred lines and their 28 F_1's produced using diallel fushion were evaluated for twelve characters, viz. , tasseling and silking dates, plant and ear heights, number of leaves/plant, stem diameter, ear length, ear circumference, number of rows/ear, number of kernels/row, 100-kernel weight, grain yield/plant in 1995 season.

The results showed that environments, crosses and crosses by environments mean squares were significant for all traits under study. Percentage of heterotic effect of the F_1 hybrids relative to grand mean and check variety ranged from -48.81 to 38.18% and from -58.85 to 11.08%, respectively for grain yield/plant. Ten and one hybrids significantly exceeded the grand mean and check variety respectively. The hybrid ($P_5 \times P_7$) had the highest heterosis values of 38.18 and 11.08% over grand mean and check variety, respectively.

Both additive and non-additive genetic effects were involved in the inheritance of most traits, with difference of their relative importance in the expression of each trait. High GCA/SCA ratios which exceeded the unity were obtained for most characters in combined data. Significant mean squares obtained for interactions of both GCA and SCA with environments for all traits with exception of (SCA × Env.) for ear circumference, indicated the

sensitivity of both kinds of genetic effects to the environments variations. Sensitivity of GCA was higher than SCA for all studied traits. Effects of both GCA and SCA showed distinct differences under various environments. The parental lines 52I, 50I and Rg4 were good general combiner for grain yield/plant. Inbred line 21G was good general combiner for tasseling and silking dates and plant and ear heights. The hybrid ($P_1 \times P_2$) was good F_1 cross combination for grain yield/plant. Result also indicated that grain yield was positively and significantly correlated with each of ear length, ear circumference, number of kernels/row, 100-kernel weight, tasseling and silking dates, plant and ear heights, number of leaves/plant and stem diameter. Results of path analysis indicate that ear circumference, silking date and 100-kernel weight proved to be important components affecting plant yield variation. In general it can be concluded that the importance of evaluating genotypes under various environments in order to get through evaluation for genotypes performance and to recognize the favorable conditions for exploiting both types of gene action in maize breeding programs.

KEY WORDS:

Maize, yield and its attributes, statistical genetic parameters, heterosis, combining ability, genotype-environments interaction correlation and path coefficients analysis.