L. INTRODUCTION

Maize (_zea mays_ L.) is one of the most important creals in Egypt, due to its vast area, total production and cash value. It is essential for human consumption, livestock. Moreover, it is also used for industrial purposes such as manfacturing starch and cooking oils. The total cultivated area of this crop was 1.976.000 feddans in 1990, and the total production was 4.400.000 tons (Anonymous 1991).

Much efforts are devoted nawadays to increase its productivity through genetical improvement. To carry out a successful breeding programme, the breeder should have enough knowledge about the type and relative amount of genetic variance components and their interactions by environments for the attribute in question. Improving cultural treatments such as providing the nutritive requirements by fertilization and using high yielding hybrids are best tools for higher yields. Therefore, the main objectives of this investigation were :-

1. To determine the importance of genotypes X nitrogen fertilizer interaction.

2. To estimate the amount of heterosis.

3. To evaluate the general combining ability (g.c.a.) and specific combining ability (s.c.a.) and their interactions by environment.

4. To estimate the correlation, regression and path coefficient analysis between yield and its main components.

5. To compute the predicted yield for the possible double crosses.

It is hoped that the present study may help corn breeder to produce new hybrid varieties of maize having higher yielding potentiality.