

1. INTRODUCTION

Maize (*Zea mays* L.) is one of the most important cereals in Egypt due to its vast grown area, total production and cash value. It is essential for human consumption and livestock. Moreover, it is also used for industrial purposes such as manufacturing starch and cooking oils. Many efforts are devoted nowadays to increase its productivity through genetical improvement.

The ultimate goal of most breeding programs is the production of improved hybrids for commercial use through the evaluation of line genotypes for high yielding ability.

Evaluating inbred lines is of prime importance for hybrid production. Therefore, nature and number of tester parents to be used for evaluating inbred lines is still an important step. The top crosses test with abroad and narrow base testers is the most common procedure for the evaluating process. The top cross method of maize breeding has been used to evaluate inbred lines for general combining ability (GCA) and specific combining ability (SCA). **Davis (1927)**, **Jinkins (1935)** and **sqargue (1939)** suggested the method of early testing that greatly effected by the nature and number of testers needed for efficient evaluation of inbred lines. **Sprague and Tatum (1942)** was the first to partition the total combining ability effects of the lines into GCA and SCA. The choice of suitable tester is important to maximize information on evaluating inbred lines for combining ability

The main objectives of the present work were:

- 1) To evaluate some inbred lines of maize.
- 2) Provide information of suitable testers for testing of inbred lines.
- 3) To estimate general and specific combining ability for several traits of maize.
- 4) To estimate heterosis percentage for grain yield relative to S.C. G.155, Pioneer 3080 and T.W.C. G. 352 as checks.