1. INTRODUCTION

Maize (*Zea mays* L.) is one of the most important grain crops in Egypt. 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 and good resistance to late wilt disease. Evaluating inbred lines is of prime importance for hybrid production, therefore, nature and number of tester parents to be used for evaluating inbred line is still an important step. The top crosses test with a broad 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), Jenkins (1935) and Sprague (1939) suggested the method of early testing that greatly affected 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. Matzinger (1953), Rawling and Thompson (1962) and Hallauer (1975) stated that appropriate tester should include simplicity in use, provide information that correctly classifies the relative importance of lines and maximize genetic gain. Darrah *et al.* (1972) and Horner *et al.* (1973) found that inbred testers have the advantage of no sampling errors of genetic variability within the testers and greater genetic variation among top crosses. Stuber *et al.* (1966) Nawar *et al.* (1980), Nawar and El- Hosary (1985),

Sedhom (1992 and 1994) and Ragheb *et al.* (1995) estimated general and specific combining ability and their role in the inheritance of grain yield and ear characters. Rawlings and Thompson (1962), Paz Jacome *et al.* (1973), and Hallauer and Miranda (1981) found that low performing testers give a better idea of general combining ability of the lines than higher performing testers. Therefore, the main objectives of the present work were :

1) To evaluate some new inbred lines of maize.
2) Provide information of suitable testers for early 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/ (ardab/ fed.) relative to S.C. 9, S.C. 10, S.C. 153 and S.C. 161 as checks.