

## LINE BY TESTER ANALYSIS FOR YIELD AND YIELD COMPONENTS IN HYBRID RICE

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### ABSTRACT

This study was conducted to investigate combining ability and gene action of rice hybrids and their parental lines. Four CMS lines as female parents and three restorers' lines as male parents were hybridized to produce 12 F<sub>1</sub> hybrids were used in a line x tester mating design. the resulted genotypes were used to estimate combining ability, heterosis, and gene action for yield and yield components characters. The results indicated that most characters were largely governed by additive gene action. General and specific combining ability effects of the genotypes for the characters under study were estimated. The results showed that the characters were controlled both general combining ability (GCA) and specific combining ability (SCA). The CMS and restorer lines showed variable effects for GCA. The study also indicated the presence of heterosis over the better parent (BP), Mid-parents (MP) and over the best check variety Giza 178 for nine characters of yield and yield components.

### INTRODUCTION

Rice has become one of the main factors of food security for the world population. Hybrid rice offers from 15-20% yield advantage over the high-yielding inbred varieties under similar cultivation conditions. In order to obtain good hybrids, it is essential to understand the nature of gene action that controls yield and its components. Combining ability estimation is a powerful tool available to select the desirable parents and crosses for the exploitation of heterosis. General combining ability (GCA) effects largely involves additive gene effects, whereas specific combining ability (SCA) effects represent only non-additive gene action including dominance. The presence of non-additive genetic variance offers scope for exploration of heterosis (Yadav *et al.*, 1999). The parents with good GCA and SCA could good hybrids (Yan *et al.*, 2000). The rice researchers around the world carried out many studies on combining ability of different lines of rice among them, (Sun *et al.*, 1993; Gong *et al.*, 1993; Chen *et al.*, 1997). Their achievements in this aspect Could recommend the use of hybrid rice by selecting good parents in hybridization breeding program. In addition, heterosis and combining ability of hybrid rice were studied by Zhang *et al.*, (2002). Line x tester analysis provides information about GCA and SCA effects of parents and is helpful in estimating various types of gene actions (Rashid *et al.*, 2007). Identification of suitable parents through line x tester analysis in rice has been studied by Singh & Kumar (2004).