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Research Paper

Studies on combining ability of promising lines for yield and its components in tomato

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ABSTRACT

Thirty two F_1 hybrids developed as a result of line x tester design involving 8 lines and 4 testers were evaluated in RCBD with three replications during 2005-2006 for tomato for yield and its components. A measure of general and components of genetic variance would be of great value in choice of parents and for effective crosses for crop improvement. Generally, general combining ability is largely associated with additive gene action. While the specific combining ability was the result of dominance epistasis and genotype environment interactions (Spagoe and Tatum, 1942). The analysis of variance for all the characters studied indicated significant differences among hybrids. The line x tester analysis for combining ability revealed the role of non-additive gene action for all the traits under consideration, except for number of primary branches indicating preponderance of non-additive components of genetic variance.

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Key words : Tomato, Hybrids, Genetic variance, Crop improvement

INTRODUCTION

Tomato is the world's largest grown vegetable crop known as protective food both because of its nutritive value and also because of its wide spread production. Tomato is rich source of minerals, Vitamins and organic acid, essential amino acids and dietary fibers. The estimated area and production of tomato crop are about 3.50 lakh ha and 53 lakh tons(www.indiaagronet.com). The average productivity of tomato in our country is merely 158q/ha while its productivity in USA is 588q/ha,in Greece 498q/ha,in Italy 466q/ha and 465q/ha in Spain (www.indiaagronet.com). So, commercial exploitation of hybrid vigour in tomato in India has received great importance on an account of several advantages of hybrids over pure line varieties such as increased yield, high resistance to biotic and abiotic stress. Keeping there facts under consideration the present investigation was designed on combining ability studies of promising lines for yield and its components in tomato.

MATERIALS AND METHODS

The experiment was carried out at the Department of Horticulture, University of Agricultural Sciences, Gandhi Krishi Vignana Kendra, Bangalore during 2005-2006. The experimental material consisted of F_1 population of 32 crosses, developed by crossing 8 lines and 4 testers. The F_1 population of 32 crosses were grown along with standard check Arka Abhijith and their parents (Table 1). Spacing was maintained at 50 cm between the plants and 100 cm between the rows. Data were recorded on plant height (cm), number of primary branches, number of secondary branches, days to 50 per cent flowering, days to first fruit maturity, number of fruits clusters per plant, average fruit weight, total yield per plant (kg), TSS (^{O}Brix), pericarp thickness (mm), number of locules per fruit and fruit firmness. Statistical analysis was carried out as per Singh and Choudhary (1977). Combining ability analysis following line x tester techniques was followed.