

DIALLEL ANALYSIS OF PARENTAL LINES FOR THE DEVELOPMENT OF TOMATO (*Solanum lycopersicum* L.) F1 HYBRIDS

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Progress in tomato hybrid breeding to increase production quality and quantity is impeded due to lack of good combiner parents to utilize in crosses for the exploitation of heterosis. Present study was conducted to identify parents with better combining ability to produce superior tomato F1 hybrids, in a partial diallel mating design using nine exotic tomato lines at Horticultural Crop Research and Development Institute, Gannoruwa, under field conditions during Maha 2013/2014. Parental lines and their ten F1 hybrid combinations including reciprocals were evaluated in comparison to the check variety, Bhathiya F1. Analysis of variance was carried out for quantitative characters such as plant height, number of branches, number of inflorescences, number of leaves per plant, leaf chlorophyll content, number of fruits per plant, average fruit weight and fruit yield per plant. Griffing's method was employed to estimate, both general and specific combining abilities. Data for each trait were used to estimate mid parent heterosis, heterobeltiosis and standard heterosis. According to the Analysis of Variance, means of most of the F1 hybrids and their respective parental values were significantly different for the traits observed. Positive heterosis values over better parents and mid parents were found in most of the crosses for plant height, per plant yield and total number of fruits per plant. Maximum mid parent heterosis and heterobeltiosis values were observed in AVTO1130×V2 for average fruit weight (105.3% and 84.9%), V2×AVTO1130 per plant yield (169.1% and 111.9%) and AVTO1130×V2 for economical yield per plant (207.4% and 117.9%). The highest general combining ability and specific combining ability per plant yield was observed in PH 12557 (287.6) and AVTO 1130×V2 (1035.7), respectively. This study indicated that, on the basis of genetic analysis V2×1130 and V10×BVC 9758 were the best performed hybrids for many characters.

Keywords: Diallel, F1 hybrid, General combining ability, Heterosis, Specific combining ability