

Short Communication

**HETROSIS FOR FRUIT YIELD AND ITS COMPONENTS IN TOMATO (*SOLANUM LYCOPERSICON* MILL.)**

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Tomato (*Solanum lycopersicon* Mill.) is one of the most important vegetable crop grown around the world. The hybrid varieties in tomato are gaining popularity due to its number of advantages along with higher yield potential in comparison to open-pollinated varieties. Realizing the economic potential of this crop, there is need to identify such cross combinations which have desirable horticultural traits and better quality in combination with high yield. Hence, the present study as undertaken to study the desirable heterosis in yield and its component traits to develop superior F<sub>1</sub> hybrids in tomato.

The investigation was undertaken at the experimental farm of Horticulture and Agro forestry Research Programme (ICAR- RCER), Ranchi, during Kharif season of 2001-02. Thirty six F<sub>1</sub> hybrids involving nine genetically diverse genotype/varieties viz., Arka Abha, CHRT-4, H-24, CH-48, CH-159, CH-180, CH-189-1, CH-242 and CH-171, were grown in randomized block design with three replications. The observation were recorded on yield and contributing traits (Table 1)

It is evident from the table that, the range of mean of F<sub>1</sub> hybrids was recorded in desirable direction for all the traits. The magnitude of heterosis percentage of F<sub>1</sub> crosses over better parent ranged from 2.28-74.91 for plant height, -1.41 to -18.26 for days to flowering, 2.04 - 40.00 for average fruit weight, 3.33 -29.41 for number of locules, 3.12 - 41.38 for pulp thickness, 0.71 - 49.53 for T.S.S. and 4.44-129.43 for fruit yield, respectively. Out of the 36 F<sub>1</sub> hybrids, the desirable significant heterosis effects over their respective better parent were observed in 6 crosses for plant height, 7 for days to flowering, 6 for average fruit weight, 4 for number of locales, 6 for pulp thickness, 7 for T.S.S. and 12 for fruit yield.

The best performing hybrids over better parents for different traits includes CHRT-4 x CH-189-1 (74.91) for plant height, H-24 x CH-242 (-18.26) for earliness, CH-48 x CH-189-1 (118.18) for average fruit weight, CH-159 x CH-171 (17.04) for fruit length, CH-48 x CH-189-1 (61.4) for fruit breadth, CH-180 x CH-189-1(57.14) for number of locales, Arka Abha x H-24

Table: 1 Range, mean values of parents, F<sub>1</sub> hybrids and heterosis percentage for different traits in tomato

	Plant height (cm)	Days to flowering	Fruit weight (g)	No. of locules	Pulp thickness (cm)	T.S.S. (°brix)	Fruit yield (q/ha)
Range of	47.67- 88.87	26.07- 38.20	29.17- 83.33	2.00- 5.17	0.43- 1.62	3.57- 5.60	284.69- 674.87
parent	55.27- 105.00	26.13- 35.03	50.00- 132.67	2.17- 6.17	0.42- 0.87	2.29- 6.00	328.76- 1057.39
F <sub>1</sub>							
Range of	2.28- 74.91	-1.41 to - 18.26	2.04- 40.00	3.33- 29.41	3.12- 41.38	0.71- 49.53	4.44- 129.43
heterosis over better parent (%)							
Three F <sub>1</sub> with (%) heterosis over better parent	CHRT-4 x CH-189-1 (74.91)	H-24 x CH-242 (-18.26)	CH-48 x CH-189-1 (118.18)	CH-180 x CH-189-1 (57.14)	Arka Abha x H-24 (41.38)	CH-48 x CH-159 (49.53)	CH-180 x CH-242 (129.43)
	Arka Abha x CH-189-1 (49.98)	CH-48 x CH-171 (-16.69)	Arka Abha x CH-180 (69.36)	CH-189-1 (29.41)	H-24 x CH-171 (28.57)	CH-159 x CH-242 (31.45)	CH-180 x CH-189-1 (125.90)
	CHRT-4 x H-24 (35.25)	H-24 x CH-159 (-16.67)	Arka Abha x CHRT-4 (40.00)	Arka Abha x CHRT-4 (19.35)	Arka Abha x CH-171 (27.56)	CH-189-1 x CH-189-1 (25.90)	CH-180 x CH-189-1 (110.14)

(41.38) for pulp thickness. In order of merit F<sub>1</sub> hybrids which exhibited significant heterosis percentage for fruit yield over their respective better parents are CH-180 x CH-242 (129.43), CH-159 x CH-242 (125.90) and CH-180 x CH-189-1 (110.14). On the other hand hybrids suitable for processing industry which exhibited desirable heterosis percentage for TSS over their respective better parents are CH-48 x CH-159 (49.537, CH-189-1 x CH-242 (31.45) and CH-159 x CH-189-1. Srivastava et al., 1998, also observed heterosis for various traits in tomato.

References

Srivastava JP, Singh H, Srivastava BP and Verma HPS (1998). Heterosis in relation to combining ability in tomato. Veg. Sci. 25(1): 45-48.  
 Kumar S, Banerjee MK and Pratap PS (1995). Studies on heterosis for various characters in tomato. Haryana J. Hort. Sci. 24 : 54-60.