

## Heterosis Studies for Growth and Flowering characters in Brinjal (*Solanum melongena* L.)

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**Abstract:** The present investigation entitled as "Heterosis studies in brinjal" was conducted at Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during kharif season 2011. The experiment comprised of six parent and fifteen hybrid with one Check. Significantly maximum plant height and number of branches per plant were observed under the crosses Local C1 × AS-1 and AKL-17 × AKL-12 respectively. In plant height, positive heterosis was found in crosses Local C1 × AS-1. Significantly minimum days to 50% flowering was observed under cross Phuleharit XAKL-20 followed by AKL-17 × AKL-20. In days to 50% flowering, negative heterosis was found in cross Phuleharit XAKL-20 over mid and better parent, standard heterosis

**Keywords:** Brinjal, heterosis.

### INTRODUCTION

Brinjal (*Solanum melongena* L.) is one of the major and principle vegetable crops widely grown in India and other parts of world. Also in Maharashtra, it is one of the important vegetable crops under cultivation. The phenomenon of heterosis has been widely utilized in the improvement of crop plants. This facilitates the easy creation of new and more productive F1 hybrid. Presence of heterosis indicates that ability of present depends upon the genetic system operating in crop plant which predicts the efficiency of selection. Study helpful for increasing yield and quality fruits. Keeping all these points in view, an investigation was carried out.

### MATERIAL AND METHODS

The present investigation entitled as "Heterosis studies in brinjal" was conducted at Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during kharif season 2011. The experiment comprised of six parent and fifteen

hybrid with one Check. The experiment was carried out using Randomized Block Design (RBD) with three replications. The observations were recorded for plant height (cm), number of branches per plant, Days to 50% flowering. The data obtained in respect of all analyzed by using statistical method.

### RESULT AND DISCUSSION

The parental mean for Plant height (cm) ranged from 60.73 (cm)(AS-1) to 76.93 (cm)(PhuleHarit) Whereas, in case of the Crosses, it ranged from 67.53 (cm)(Local C-1-1 × AKL-12) to 97.4 (cm) (AKL-17 × AKL-12). Mid parent heterosis is ranged from -0.71 (cm) (AKL-17 × PhuleHarit) to 46.26 \*\* (cm) Local C-1-1 × AS per cent, Out of 15 Crosses, 11 Crosses showed significant positive heterosis. The cross Local C-1-1 × AS-1 (46.26)\*\* showed highest average heterosis followed by AKL-12 × AKL-20 (34.86)\*\*. The heterobeltiosis ranged from -4.88 (cm) (Local C-1-1 × AKL-12) to 35.68 \*\* (cm) (Local C-1-1 × AS-1). Out of 15 Crosses, 11 Crosses showed significant

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positive heterobeltiosis. The cross exhibited Local C-1-1 × AS-1 highest heterobeltiosis followed by AKL-17 × AKL-12 (29.74\*\*). The standard heterosis ranged from -26.46\*\* to 6.07 percent. Out of 15 Crosses, 7 Crosses showed negative standard heterosis. The cross Local C-1-1 × AS-1 (-26.46\*\*) exhibited highest standard negative heterosis followed by AKL-17 × AKL-20 (18.40)\*\*. Out of Fifteen hybrids, eleven over mid parent, six over better parent showed significant heterosis in the desirable direction. However, none of the hybrids exhibited significant desirable heterosis over the check.

The parental mean for number of branches ranged from 13.73 (Local C-1-1) to 18.2 (AKL-17). Whereas, in case of the Crosses it ranged from 13.73

(Local C-1-1 × PhuleHarit) to 23.87 (AKL-17 × AKL-12). Mid parent heterosis is ranged from -16.27 (AS-1 × AKL-17) to 47.02 \*\* (AKL-17 × AKL-12), Out of 15 Crosses, 1 Cross showed significant positive heterosis. The cross AKL-17 × AKL-12 (47.02)\*\* highest average heterosis. The heterobeltiosis ranged from -24.36\* (LocalC-1-1 × AKL-17) to 32.59 \*\* (AKL-17 × AKL-12) Out of 15 Crosses, 1 Cross showed significant positive heterobeltiosis. The cross exhibited Local AKL-17 × AKL-12 highest hetero beltiosis. The standard heterosis ranged from 127.42\*\* (LocalC-1-1 × AKL-17) to 294.27 \*\* (AKL-17 × AKL-12). Out of 15 Crosses, all Crosses showed positive standard heterosis. The cross AKL-17 × AKL-12 (294.27)\*\* exhibited highest standard positive heterosis followed by As-1 × AKL-12 (189.65)\*\*. Out of fiftine hybrids, one over mid

**Table 1**  
**Magnitude of heterosis for plant height (cm), No. of branches per plant, Days to 50% Flowering**

Crosses	Heterosis% over								
	Plant height			No. of branches/plant			Days to 50% Flowering		
	MP	BP	SH	MP	BP	SH	MP	BP	SH
(Local C-1-1) × (AS-1)	46.26 **	35.68 **	4.9	18.7	15.87	181.39 **	4.81 **	2.24	-13.72 **
(Local C-1-1) × (AKL-17)	6.01	3.58	-16.08 **	-14.49	-24.36 *	127.42 **	9.11 **	7.60 **	-9.19 **
(Local C-1-1) × (PhuleHarit)	17.80 **	13.26 *	-5.11	-4.63	-7.21	126.87 **	6.06 **	2.5	-13.50 **
(Local C-1-1) × (AKL-12)	-2.46	-4.88	-26.46 **	5.39	3.69	147.80 **	-0.5	-1.93	-17.24 **
(Local C-1-1) × (AKL-20)	14.60 *	10.78	-8.24	-3.18	-10.34	143.39 **	-0.15	-3.41 *	-12.80 **
(AS-1) × (AKL-17)	12.85 *	2.69	-16.80 **	-16.27	-23.63 *	129.63 **	15.39 **	14.25 **	-6.25 **
(AS-1) × (PhuleHarit)	17.83 **	5.63	-11.50 *	-2.46	-3.11	140.09 **	13.95 **	12.73 **	-9.33 **
(AS-1) × (AKL-12)	29.74 **	23.52 **	-9.25	19	16.89	189.65 **	8.96 **	7.94 **	-11.52 **
(AS-1) × (AKL-20)	15.95 *	4.47	-13.46 *	-11.13	-15.01	130.73 **	-4.94 **	-10.13 **	-18.86 **
(AKL-17) × (PhuleHarit)	-0.71	-2.6	-18.40 **	-10.57	-18.52	142.29 **	-4.03 **	-5.81 **	-23.00 **
(AKL-17) × (AKL-12)	37.70 **	31.62 **	6.07	47.02 **	32.59 **	294.27 **	7.22 **	7.08 **	-12.23 **
(AKL-17) × (AKL-20)	-0.76	-2.1	-18.91 **	-9.78	-13.7	156.61 **	-7.87 **	-12.22 **	-20.75 **
(PhuleHarit) × (AKL-12)	13.89 *	6.84	-10.41	-0.23	-2	142.84 **	5.92 **	4.08 *	-14.69 **
(PhuleHarit) × (AKL-20)	13.41 *	12.73 *	-5.48	-0.74	-5.07	157.71 **	-8.15 **	-13.83 **	-22.20 **
(AKL-12) × (AKL-20)	34.86 **	26.82 **	5.05	6.46	-1.42	167.62 **	-2.86 *	-7.45 **	-16.45 **
Pusa Hybrid-6 (Check)									
	Mid parent	Better parent	Standard Check	Mid parent	Better parent	Standard Check	Mid parent	Better parent	Standard Check
SEm±	4.19	4.84	4.84	1.17	1.98	1.98	0.85	0.98	0.98
CD @ 5%	8.47	9.79	9.79	3.47	4.01	4.01	1.72	1.99	1.99
CD @ 1%	11.34	13.10	13.10	4.64	5.36	5.36	2.30	2.66	2.66

\* - Significant at 5% level

\*\* - Significant at 1% level

parent, three over better parent showed significant heterosis in the desired (positive) direction. all crosses showed significant positive heterosis over standard check.

The mean value of days to 50% flowering ranged from 59.7 (PhuleHarit) to 63.86 (Local C-1-1), and 59 (PhuleHarit × AKL-20) to 71.1 (AS-1 × AKL-17) among the parents and hybrids respectively (Table 2). Among six parents, mean performance ranges from parents 59.7 (PhuleHarit) to 63.86 (Local C-1-1), Where as in crosses it ranged in 59 (PhuleHarit × AKL-20) to 71.1 (AS-1 × AKL-17). Among parents, three parents Phuleharit (59.7 days), AS-1 (60.86 days), AKL-12 (62.16 days) was found to be earliest one. Whereas, AKL-17 (62.23 days), Local C-1-1 (63.86 days), AKL-20 (68.46 days) were latest for days to 50% flowering.

While in the crosses AKL-17 × PhuleHarit (58.4 days), PhuleHarit × AKL-20 (59 days) and AKL-17 × AKL-20 (60.1 days) was found to be earliest among the hybrids. The (AS-1 × AKL-17) (71.1 days) was latest one among hybrids followed by Local C-1-1 × AKL-17 (68.87 days). Mid parent heterosis is ranged from -8.15 \*\* (PhuleHarit × AKL-20) to 13.95 \*\* (AS-1 × Phuleharit) Out of 15 crosses 5 crosses showed significant negative heterosis. The cross showed Phuleharit × AKL-20 (-8.15) \*\* highest average heterosis followed by AKL-17 × AKL-20 (-7.87) \*\*. The heterobeltiosis ranged from, -13.83 \*\* (PhuleHarit × AKL-20) to 12.73 \*\* (AS-1 × Phuleharit) Out of 15 crosses 6 crosses showed significant negative heterobeltiosis. The cross Phuleharit × AKL-20 (-13.83) \*\* exhibited highest heterobeltiosis followed by AKL-17 × AKL-20 (-4.41%). The standard heterosis ranged from -23.00 \*\* (AKL-17 × PhuleHarit) to -6.25 \*\* (AS-1) × (AKL-17)

Out of 15 crosses 6 crosses showed negative standard heterosis. The cross (AKL-17 × PhuleHarit (-23.00) \*\* exhibited highest standard heterosis followed by PhuleHarit × AKL-20 (-22.20) \*\*

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