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Heterosis for growth, yield and quality traits in Ridge gourd [*Luffa acutangula* (L.) Roxb.]

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Abstract
The present study was carried out to estimate heterosis for growth, yield and quality traits in ridge gourd. A total of thirty F_1 hybrids were developed using a line × tester mating design. These hybrids, along with ten lines and three testers, were evaluated in a randomized block design with two replications at the Department of VSC, College of Horticulture, Bagalkot, during *summer* 2025. The mean values of F_1 hybrids over two replications were used to estimate heterosis. The hybrid Hireharukuni Local × Arka Sumeet recorded the highest standard heterosis for fruit yield per vine (57.96% over commercial check-1 (Arka Vikram) and 57.27% over commercial check-2 (Naga F_1) and was identified as the best hybrid, excelling in number of fruits per vine and fruit length. Hireharukuni Local × Arka Prasan ranked second with 52.21% and 51.54% heterosis over the checks, while IC92700 × Arka Sumeet was third, showing 46.02% and 45.67% heterosis and notable superiority for earliness and average fruit weight.

Keywords: Ridge gourd, heterosis, mid parent, better parent, commercial check

Introduction
Ridge gourd [*Luffa acutangula* L. Roxb.] is an important cucurbitaceous vegetable in this family. It belongs to genus *Luffa* with a diploid chromosome number 2n=26 and it is native to India. The term "Luff" or "Loofah" has its roots in Arabic and is used to describe the sponge-like texture of the mature fruit. The crop has a rich history of cultivation in the tropical regions of Asia and Africa. As a warm-season crop, it can withstand higher temperatures and make it ideal for extensive cultivation across tropical regions. It is popularly known as Kalitori, Angled gourd, Angled loofah, Chinese okra, Silky gourd and Ribbed gourd (Narasannavar *et al*., 2014) [10].

The absence of superior, high yielding varieties and the prevalence of pests and diseases account for India's low ridge gourd production and productivity. Despite the crop's potential, economic significance and medicinal use, crop improvement programmes have not received proper attention. However, due to its nutritional worth and therapeutic significance, ridge gourd farming has recently gained popularity. Regarding several quantitative and qualitative aspects, ridge gourd has developed a wide range of variations. An improvement in the yield and quality can be possible with heterosis breeding. Ridge gourd, being predominantly monoecious, is a cross-pollinated crop and it provides ample scope for utilization of the hybrid vigour (Sarkar *et al*., 2015) [13]. Breeders can increase yield and other economic features by using the practical instrument of heterosis breeding. Hence, the present study was undertaken with the objective of estimating the magnitude of heterosis for yield and quality traits.

Materials and Methods
The present study was conducted at the Department of Vegetable Science, College of Horticulture, Bagalkot, University of Horticultural Sciences, Bagalkot, Karnataka, India, during the *Rabi* and *Summer* seasons of 2024-25. The experimental material comprised ten lines, namely IC0648090, Rajanukunte Local, Hireharukuni Local, IC110893, IC23255, IC92700, IC0648092, IC201145, Budihal Local and IC0648094. These lines were crossed in a Line × Tester design with three testers namely, Arka Prasan, Arka Sujat and Arka Sumeet during the *Rabi* season of 2024.

The resulting 30 F_1 hybrids, along with the thirteen parents and two standard checks, were evaluated in a randomized block design with two replications with a spacing of 2 × 1 m during *Summer* 2025.

Observations were recorded from three randomly selected plants. The F_1 values, averaged over the two replications, were used to estimate heterosis. The magnitude of heterosis was expressed as the percentage increase or decrease of the F_1 mean over the better parent (BP) following the methods of Turner (1953) [57] and Hays *et al*. (1955) and percent superiority over standard checks was also calculated. Analysis of variance for all traits was performed according to the procedure described by Panse and Sukhatme (1985) [12].

Results and discussion

Analysis of variance

The analysis of variance showed clear differences in the distribution of sum of squares across sources of variation. All growth, yield and quality traits exhibited highly significant differences among the genotypes (Table 1), indicating substantial genetic variability and strong potential for heterosis, consistent with Acharya *et al*. (2019) [1]. The lines also displayed marked variation for every trait. Significant differences among line × tester crosses further reflected the broad genetic diversity in both groups. The significant line × tester interactions for all traits suggest the role of non-allelic gene interactions in trait expression (Dey *et al*., 2007) [5].

Magnitude of heterosis

Heterosis for yield is primarily manifested through improvements in growth and earliness traits, which have a direct impact on overall productivity. An ideal plant type for higher yield usually requires vigorous growth, longer vines and a greater number of primary branches to support higher fruit production (Sirohi & Choudhury, 1978) [15]. For number of primary branches per vine, the cross IC201145 × Arka Sujat recorded the highest mid-parent heterosis (20.82%), whereas Rjanakunte Local × Arka Sujat showed the lowest (Table 2). Three hybrids expressed significant positive heterosis over the mid-parent and both commercial checks, in agreement with earlier reports in ridge and sponge gourd (Chittora *et al*. 2018; Chauhan *et al*. 2018) [3]. Hireharukuni Local × Arka Sujath displaying the highest heterosis over the mid-parent, better parent and both checks (12.75%, 11.5%, 19.43%, and 18.03%, respectively) for vine length. Nine hybrids were superior to the mid-parent, four to the better parent and several to the commercial checks (Table 2), supporting earlier findings by Chittora *et al*. (2018) [4].

Earliness traits—days to first female and male flowering, nodes to first female and male flowering and days to first harvest—showed significant variation. Desirable negative heterosis was expressed by several hybrids. Days to first female flowering, IC0648092 × Arka Prasan showing the greatest mid-parent heterosis (-11.39%) and IC92700 × Arka Prasan the best better parent heterosis (-11.98%) (Table 2). Many hybrids showed superiority across different heterosis categories, consistent with earlier work (Chittora *et al*., 2018; Narasimha Rao & Venkat Rao, 2002) [4, 11]. For days to first male flowering, Hireharukuni Local × Arka Sumeet showing strong heterosis both over the better parent (-16.97%) and check-1 (-9.52%) (Table 3). A large proportion of hybrids showed significant heterosis, particularly over the better parent, similar to reports in sponge gourd (Lakhnotra *et al*., 2019) [8].

IC0648094 × Arka Prasan recorded the highest mid-parent heterosis (-5.40%), while IC0648090 × Arka Sujath expressed the best better parent heterosis (-8.24%) for node to first female flowering (Table 3). Several hybrids exceeded commercial checks as well. A similar trend of negative heterosis for this trait has been reported in ridge gourd (Chittora *et al*., 2018) [4]. For node to first male flower appearance, IC92700 × Arka Sumeet recorded the strongest heterosis (-7.82% over mid-parent and -17.50% over better parent) (Table 3). Hybrids such as IC92700 × Arka Sujath also performed significantly better than checks. Comparable results were noted earlier in sponge gourd (Lakhnotra *et al*., 2019) [8]. For days to first harvest, IC92700 × Arka Sumeet emerging as the earliest. This hybrid also recorded desirable heterosis over mid-parent (-7.51%), better parent (-8.73%) and both checks (Table 4). Early maturity is an important breeding objective, contributes to increased market value and aligns with previous findings (Shaha & Kale, 2003a).

Yield-contributing traits exhibited substantial variability and frequent heterotic responses. Fruit length varied widely across all genetic groups and hybrids such as Hireharukuni Local × Arka Sumeet and IC0648094 × Arka Prasan recorded exceptionally high heterosis across mid-parent (56.07%), better parent and commercial checks (Table 4). Similar findings were reported by Bhalerao *et al*. (2022) [22]. Fruit diameter also showed considerable variation, with most hybrids expressing desirable positive heterosis. IC0648094 × Arka Prasan showed maximum mid-parent heterosis (22.25%), while Hireharukuni Local × Arka Prasan showed the highest heterosis over checks (Table 4). Comparable results were reported in bitter gourd (Tangamani *et al*., 2011).

For average fruit, IC0648094 × Arka Prasan exhibited the highest mid-parent heterosis (27.56%), while IC92700 × Arka Sujat showed maximum heterosis over the better parent (Table 5). Many hybrids surpassed commercial checks, consistent with reports by Bhalerao *et al*. (2022) and Nagadevi *et al*. (2022). Hireharukuni Local × Arka Sumeet again displayed outstanding performance, showing the highest heterosis across all comparisons for fruits per vine. These findings are in agreement with results in ridge and bitter gourd (Narasimha Rao & Venkat Rao, 2002) **[11]**.

Yield parameters—per vine, per plot and per hectare—similarly revealed wide genetic divergence and strong heterotic expression. The hybrid Hireharukuni Local × Arka Sumeet consistently recorded the highest heterosis over the better parent and both checks for all yield traits (for fruit yield per vine, 55.22% over better parent, 57.96% over commercial check-1, 57.27% over commercial check-2) whereas IC0648094 × Arka Prasan showed the largest mid-parent heterosis (Table 5). Yield heterosis observed here matches earlier reports (Wakale *et al*. 2018; 2013; Narasannavar *et al*. 2014 [10]; Kamble, 2018) [10, 18].

Significant heterosis was evident over the mid-parent, better parent and checks for TSS. Positive heterosis is desirable to improve fruit quality. The cross ICC0648094 × Arka Sumeet showed maximum heterotic effect (36.7% over the mid-parent, 10.48% over commercial check 1), IC92700 × Arka Prasan showed 22.76% over better parent, Hireharukuni Local × Arka Sujat recorded 14.12% over check 2 (Table 6). Similar findings were previously reported in ridge gourd (Chittora *et al*., 2018 [4]; Nagadevi *et al*.,

2022) [4, 9]. Significant heterosis was observed for Vitamin C over the mid-parent better parent and commercial checks. Positive heterosis is desirable for nutritional quality. The cross ICO648094 × Arka Sumeet exhibited the highest heterotic effect (36.7% over the mid-parent, 10.48% over check-1). Rajanakunte Local × Arka Sumeet showed 17.09% heterosis over better parent and 16.43% over check-2 (Table 6). Several hybrids expressed desirable heterosis, consistent with earlier reports (Chittora *et al.*, 2018 [4]; Nagadevi *et al.*, 2022) [4, 9].

Table 1: Analysis of variance (mean sum of squares) of parents, hybrids and line × tester analysis for various characters in ridge gourd

Sl. No.	Characters	Treatments	Parents	Parent × Crosses	Crosses	Lines	Testers	Line × Tester	Error
	df	42	12	1	29	9	2	18	42
1	NPBV	0.21**	0.22**	0.14	0.19**	0.22**	0.24*	0.19**	0.04
2	VL	0.26**	0.31**	0.0002	0.25**	0.33**	0.12**	0.23**	0.01
3	DFFF	6.71**	7.64**	20.77**	5.84**	9.57**	1.57	3.05**	0.67
4	DFMF	3.77**	7.29**	10.82*	2.06*	6.06**	3.02*	2.32*	0.87
5	NFFF	0.25**	0.25**	0.001	0.26**	0.27**	0.12**	0.11**	0.01
6	NFMF	0.07**	0.13**	0.002	0.05**	0.05**	0.22**	0.02*	0.01
7	DFH	14.08**	7.88**	0.16	17.13**	9.35**	0.84	2.97**	0.47
8	FL	239.02**	156.97**	2130.17**	207.76**	62.62**	129.55**	47.63**	1.28
9	FD	0.43**	0.42**	4.25**	0.30**	0.48**	0.09**	0.05**	0.01
10	AFW	2265.45**	2229.63**	16131.47**	1802.14**	1868.89**	145.19*	521.08**	1.82
11	NFPV	7.79**	6.03**	41.26**	7.37**	7.74**	0.01	0.69**	0.06
12	FYPV	0.95**	0.68**	6.63**	0.87**	0.73**	0.02*	0.10**	0.002
13	FYPP	95.28**	68.76**	666.47**	86.57**	73.06**	1.91*	10.38**	0.23
14	FYPH	23.81**	17.18**	166.60**	21.63**	18.25**	0.47*	2.59**	0.06
15	TSS	0.53**	0.48**	0.01	0.57**	0.41**	0.42**	0.62**	0.01
16	VC	0.71**	0.98**	0.09*	0.62**	0.99**	0.55**	0.69**	0.02

Note: * and** indicate significance of values at p=0.05 and p=0.01, respectively. NPBV: Number of primary branches per vine, VL: Vine length at final harvest (m), DFF: Days to first female flower opening, DFMF: Days to first male flower opening, NFFF: Node at first female flower appears, NFMF: Node at first female flower appears, DFH: Days to first harvest, FL: Fruit length (cm), FD: Fruit diameter (cm), AFW: Average fruit weight (g), NFV: Number of fruits per vine, FYPV: Fruit yield per vine (kg), FYPP: Fruit yield per plot (kg), FYPH: Fruit yield per ha (t), TSS: Total soluble solids (°Brix), VC: Vitamin C (mg/100).

Table 2: Per cent heterosis over mid parent (MP), better parent (BP) and the commercial checks (CC) for growth and yield parameters in ridge gourd

Sl. No.	Crosses	Number of primary branches per vine				Vine length at final harvest				Days to first female flower opening			
		MP	BP	CC1	CC2	MP	BP	CC1	CC2	MP	BP	CC1	CC2
1	$L_1 \times T_1$	2.34	-4.63	5.11	6.71	-1.23	-11.62 **	-4.50 *	-5.62 **	-5.63 **	-6.82 **	3.27 *	2.57
2	$L_1 \times T_2$	0.00	-8.62 *	5.11	6.71	-3.49	-12.44 **	-8.29 **	-9.37 **	2.82	2.39	10.76 **	10.02 **
3	$L_1 \times T_3$	5.05	5.05	0.00	1.52	10.94 **	4.41 *	0.95	-0.23	3.21 *	2.64	11.02 **	10.27 **
4	$L_2 \times T_1$	-2.51	-4.63	5.11	6.71	1.18	-6.14 **	1.42	0.23	-4.61 **	-6.77 **	3.46 *	2.76
5	$L_2 \times T_2$	-26.98 **	-30.03 **	-19.52 **	-18.29 **	4.81 *	-1.36	3.32	2.11	-0.79	-1.27	5.91 **	5.19 **
6	$L_2 \times T_3$	-6.59	-10.86 *	-6.31	-4.88	-11.03 **	-12.99 **	-15.88 **	-16.86 **	-0.07	-0.37	6.51 **	5.80 **
7	$L_3 \times T_1$	3.81	3.81	14.41 **	16.16 **	2.20	1.75	9.95 **	8.67 **	-5.83 **	-10.92 **	-0.37	-1.04
8	$L_3 \times T_2$	-15.47 **	-17.23 **	-4.80	-3.35	12.75 **	11.5 **	19.43 **	18.03 **	-6.84 **	-10.18 **	-3.01	-3.66 *
9	$L_3 \times T_3$	-0.29	-7.08	2.40	3.96	-3.72 *	-8.41 **	-1.90	-3.04	-0.74	-3.72 *	3.15	2.46
10	$L_4 \times T_1$	-9.06	-15.26 **	-6.61	-5.18	10.28 **	-3.51 *	4.27 *	3.04	-2.13	-4.24 *	6.14 **	5.43 **
11	$L_4 \times T_2$	4.86	-4.18	10.21 *	11.89 *	6.38 **	-5.66 **	-1.18	-2.34	-0.83	-1.30	5.88 **	5.17 **
12	$L_4 \times T_3$	6.62	6.62	1.50	3.05	10.13 **	1.23	-2.13	-3.28	1.40	1.10	8.08 **	7.35 **
13	$L_5 \times T_1$	-21.17 **	-22.89 **	-15.02 **	-13.72 *	-3.2	-7.02 **	0.47	-0.70	-2.73	-6.40 **	4.04 *	3.34 *
14	$L_5 \times T_2$	-18.26 **	-21.67 **	-9.91 *	-8.54	-8.82 **	-11.09 **	-6.87 **	-7.96 **	2.75	0.88	8.17 **	7.44 **
15	$L_5 \times T_3$	-5.09	-9.43 *	-4.80	-3.35	-9.42 **	-10.71 **	-11.14 **	-12.18 **	-3.33 *	-5.15 **	1.59	0.90
16	$L_6 \times T_1$	-8.65	-13.62 **	-4.80	-3.35	-3.14	-5.26 **	2.37	1.17	-7.05 **	-11.98 **	-1.49	-2.16
17	$L_6 \times T_2$	-10.70 *	-17.23 **	-4.80	-3.35	-5.24 **	-5.88 **	-1.42	-2.58	-2.26	-5.25 **	1.94	1.25
18	$L_6 \times T_3$	11.49 *	9.79	7.81	9.45	7.58 **	4.13 *	7.58 **	6.32 **	-2.42	-5.25 **	1.59	0.90
19	$L_7 \times T_1$	-20.06 **	-27.25 **	-19.82 **	-18.6 **	-19.55 **	-22.37 **	-16.11 **	-17.1 **	-11.39 **	-15.11 **	1.33	0.65
20	$L_7 \times T_2$	2.34	-8.62 *	5.11	6.71	1.15	-0.90	3.79 *	2.58	-7.98 **	-13.41 **	3.67 *	2.97
21	$L_7 \times T_3$	7.77	5.05	0.00	1.52	6.97 **	5.20 *	5.45 **	4.22 *	-6.00 **	-11.51 **	5.74 **	5.03 **
22	$L_8 \times T_1$	-2.91	-18.26 **	-9.91 *	-8.54	-16.93 **	-20.39 **	-13.98 **	-14.99 **	-8.59 **	-8.78 **	1.33	0.65
23	$L_8 \times T_2$	20.82 **	0.00	15.02 **	16.77 **	5.58 **	2.71	7.58 **	6.32 **	-9.9 **	-11.84 **	-1.66	-2.32
24	$L_8 \times T_3$	17.25 **	5.05	0.00	1.52	0.48	-0.48	-1.66	-2.81	-7.60 **	-9.67 **	0.70	0.02
25	$L_9 \times T_1$	-10.96 *	-13.62 **	-4.80	-3.35	-5.15 *	-15.13 **	-8.29 **	-9.37 **	2.99	-0.36	10.27 **	9.53 **
26	$L_9 \times T_2$	-22.25 **	-26.11 **	-15.02 **	-13.72 *	1.50	-7.92 **	-3.55	-4.68 *	5.12 **	3.41 *	10.79 **	10.04 **
27	$L_9 \times T_3$	-14.5 **	-17.97 **	-15.02 **	-13.72 *	-2.86	-8.58 **	-11.61 **	-12.65 **	-0.73	-2.39	4.44 *	3.73 *
28	$L_{10} \times T_1$	-17.25 **	-22.89 **	-15.02 **	-13.72 *	-15.75 **	-15.75 **	-8.77 **	-9.84 **	-1.11	-2.77	7.68 **	6.96 **
29	$L_{10} \times T_2$	-9.43 *	-17.23 **	-4.80	-3.35	-5.78 **	-7.22 **	0.47	-0.70	3.27 *	3.23 *	10.72 **	9.97 **
30	$L_{10} \times T_3$	0.00	0.00	-4.80	-3.35	-9.24 **	-14.00 **	-6.87 **	-7.96 **	-3.75 *	-3.87 *	3.01	2.32
	SE m ±	0.17	0.19	0.19	0.19	0.08	0.09	0.09	0.09	0.71	0.82	0.82	0.82
	CD at 5%	0.35	0.40	0.40	0.40	0.17	0.19	0.19	0.19	1.45	1.67	1.67	1.67
	CD at 1%	0.47	0.54	0.54	0.54	0.22	0.26	0.26	0.26	1.95	2.25	2.25	2.25

Table 3: Per cent heterosis over mid parent (MP), better parent (BP) and the commercial checks (CC) for growth and yield parameters in ridge gourd

Sl. No.	Crosses	Days to first male flower opening				Node at first female flower appears				Node at first male flower appears			
		MP	BP	CC1	CC2	MP	BP	CC1	CC2	MP	BP	CC1	CC2
1	$L_1 \times T_1$	-6.06 **	-11.51 **	-6.25 **	4.44	-2.91 **	-5.88 **	-3.67 **	5.35 **	-3.81 *	-5.43 **	-2.32	3.27
2	$L_1 \times T_2$	1.57	-1.05	-1.00	10.3 **	-2.52 *	-8.24 **	-5.56 **	3.28 **	0.59	-1.00	-1.16	4.50 *
3	$L_1 \times T_3$	-1.53	-7.42 **	-1.10	10.18 **	-2.52 *	-8.10 **	-5.44 **	3.40 **	-6.46 **	-11.63 **	-1.93	3.68 *
4	$L_2 \times T_1$	-4.03 *	-9.13 **	-4.03 *	6.91 **	-2.10 *	-3.18 **	-6.67 **	2.07 *	4.72 *	-0.21	2.90	8.79 **
5	$L_2 \times T_2$	-2.41	-4.93 *	-4.70 *	6.17 *	3.58 **	2.18 *	-3.67 **	5.35 **	5.91 **	4.15 *	0.58	6.34 **
6	$L_2 \times T_3$	0.48	-5.06 *	1.12	12.66 **	-1.91	-3.26 **	-8.67 **	-0.12	-6.48 **	-15.77 **	-5.03 **	0.41
7	$L_3 \times T_1$	2.55	-4.65 *	0.43	11.89 **	-4.03 **	-7.09 **	-10.11 **	-1.70	-6.08 **	-11.09 **	-7.35 **	-2.04
8	$L_3 \times T_2$	-0.59	-5.43 *	-4.95 *	5.89 *	-1.22	-1.59	-9.78 **	-1.34	-2.43	-3.70 *	-6.77 **	-1.43
9	$L_3 \times T_3$	-8.21 **	-16.97 **	-9.52 **	0.80	-0.49	-0.98	-9.00 **	-0.49	-7.40 **	-16.22 **	-5.61 **	-0.20
10	$L_4 \times T_1$	-4.47 *	-6.46 **	-1.84	9.36 **	3.15 **	0.69	2.00 *	11.54 **	-3.82 *	-5.64 **	-2.51	3.07
11	$L_4 \times T_2$	-0.64	-1.05	-0.20	11.18 **	1.27	-3.88 **	-2.22 *	6.93 **	1.97	0.60	0.00	5.73 **
12	$L_4 \times T_3$	-5.09 *	-7.75 **	-1.86	9.33 **	5.29 **	0.48	1.78	11.3 **	-7.02 **	-12.45 **	-2.71	2.86
13	$L_5 \times T_1$	0.07	-1.95	2.71	14.42 **	2.03 *	-0.12	0.56	9.96 **	-1.90	-3.28	-0.19	5.52 **
14	$L_5 \times T_2$	-3.95	-4.24 *	-3.68	7.31 **	4.50 **	-0.12	0.56	9.96 **	-0.20	-2.00	-1.74	3.89 *
15	$L_5 \times T_3$	-4.70 *	-7.49 **	-1.58	9.64 **	4.61 **	0.12	0.78	10.21 **	-6.26 **	-11.2 **	-1.55	4.09 *
16	$L_6 \times T_1$	-3.47	-10.10 **	-4.70 *	6.17 *	-3.32 **	-6.21 **	-9.33 **	-0.85	-4.54 *	-10.21 **	-6.38 **	-1.02
17	$L_6 \times T_2$	-1.54	-5.48 *	-5.08 *	5.75 *	-1.34	-1.58	-9.78 **	-1.34	-6.53 **	-8.75 **	-11.41 **	-6.34 **
18	$L_6 \times T_3$	-6.27 **	-13.81 **	-6.87 **	3.75	-2.18 *	-2.56 *	-10.44 **	-2.07 *	-7.82 **	-17.5 **	-6.58 **	-1.23
19	$L_7 \times T_1$	-9.09 **	-9.54 **	-5.23 *	5.57 *	0.12	-0.82	-4.44 **	4.50 **	1.37	-3.29	0.00	5.73 **
20	$L_7 \times T_2$	-3.78	-5.74 *	-1.97	9.22 **	4.18 **	2.79 *	-3.00 **	6.08 **	3.45	2.06	-1.35	4.29 *
21	$L_7 \times T_3$	-5.21 *	-6.30 **	-0.59	10.75 **	5.01 **	3.75 **	-2.11 *	7.05 **	-1.90	-10.29 **	0.00	5.73 **
22	$L_8 \times T_1$	-5.66 **	-7.50 **	-2.91	8.16 **	1.04	0.58	-3.11 **	5.95 **	0.00	-4.95 *	-1.55	4.09 *
23	$L_8 \times T_2$	-2.54	-3.11	-1.97	9.22 **	2.61 *	0.61	-4.00 **	4.98 **	4.06 *	2.68	-0.77	4.91 *
24	$L_8 \times T_3$	-9.17 **	-11.76 **	-5.95 **	4.78 *	4.98 **	3.14 **	-1.67	7.53 **	-1.71	-10.31 **	0.00	5.73 **
25	$L_9 \times T_1$	-2.72	-9.30 **	-3.96	7.00 **	6.21 **	4.65 **	0.67	10.09 **	2.15	-2.25	0.97	6.75 **
26	$L_9 \times T_2$	-0.50	-4.40 *	-4.08 *	6.85 **	-0.12	-0.97	-7.67 **	0.97	5.06 **	3.89 *	0.39	6.13 **
27	$L_9 \times T_3$	-1.62	-8.83 **	-2.25	8.9 **	-1.68	-2.42 *	-9.00 **	-0.49	-6.25 **	-14.75 **	-4.26 *	1.23
28	$L_{10} \times T_1$	-7.44 **	-9.71 **	-5.08 *	5.75 *	-5.14 **	-6.11 **	-7.78 **	0.85	-2.51	-5.58 **	-2.32	3.27
29	$L_{10} \times T_2$	-4.18 *	-4.39 *	-3.96	7.00 **	2.22 *	-1.21	-3.00 **	6.08 **	4.59 *	4.40 *	1.35	7.16 **
30	$L_{10} \times T_3$	-7.20 **	-10.14 **	-4.24 *	6.68 **	5.50 **	2.30 *	0.22	9.60 **	-2.62	-9.16 **	0.77	6.54 **
	SE m ±	0.81	0.93	0.93	0.93	0.09	0.10	0.10	0.10	0.09	0.10	0.10	0.10
	CD at 5%	1.65	1.91	1.91	1.91	0.18	0.21	0.21	0.21	0.18	0.21	0.21	0.21
	CD at 1%	2.22	2.57	2.57	2.57	0.24	0.28	0.28	0.28	0.25	0.28	0.28	0.28

Table 4: Per cent heterosis over mid parent (MP), better parent (BP) and the commercial checks (CC) for growth and yield parameters in ridge gourd

Sl. No.	Crosses	Days to first harvest				Fruit length				Fruit diameter			
		MP	BP	CC1	CC2	MP	BP	CC1	CC2	MP	BP	CC1	CC2
1	$L_1 \times T_1$	-1.90	-7.80 **	7.19 **	7.04 **	-11.3 **	-34.03 **	-16.94 **	-29.32 **	4.80 *	-5.60 **	2.49	-1.85
2	$L_1 \times T_2$	-2.94 *	-7.74 **	7.09 **	6.94 **	23.4 **	-0.12	-0.91	-15.69 **	7.97 **	-4.84 **	8.56 **	3.97 *
3	$L_1 \times T_3$	-1.17	-5.71 **	9.20 **	9.05 **	1.44	-28.00 **	5.41	-10.31 **	16.91 **	8.38 **	10.77 **	6.08 **
4	$L_2 \times T_1$	0.04	-1.95	5.4 **	5.25 **	29.55 **	10.58 **	39.22 **	18.46 **	7.38 **	7.38 **	16.57 **	11.64 **
5	$L_2 \times T_2$	-0.34	-1.30	6.04 **	5.89 **	28.87 **	22.26 **	21.29 **	3.20	3.97 *	1.45	15.75 **	10.85 **
6	$L_2 \times T_3$	-4.55 **	-5.39 **	1.71	1.57	27.58 **	2.57	50.16 **	27.77 **	12.83 **	9.67 **	19.06 **	14.02 **
7	$L_3 \times T_1$	-5.44 **	-5.44 **	-2.34 *	-2.47 *	38.24 **	23.94 **	56.04 **	32.77 **	16.26 **	12.92 **	30.39 **	24.87 **
8	$L_3 \times T_2$	-1.02	-2.05	3.28 *	3.14 *	52.85 **	52.36 **	52.13 **	29.45 **	12.98 **	12.44 **	29.83 **	24.34 **
9	$L_3 \times T_3$	-5.72 **	-6.96 **	-1.47	-1.61	27.63 **	7.35 **	57.16 **	33.73 **	18.53 **	11.72 **	29.01 **	23.54 **
10	$L_4 \times T_1$	8.18 **	4.56 **	16.15 **	15.99 **	-25.28 **	-44.72 **	-30.4 **	-40.78 **	-1.44	-12.98 **	-5.52 **	-9.52 **
11	$L_4 \times T_2$	6.17 **	3.48 **	15.10 **	14.94 **	-19.16 **	-34.97 **	-35.49 **	-45.11 **	-6.44 **	-19.13 **	-7.73 **	-11.64 **
12	$L_4 \times T_3$	4.60 **	2.02	13.57 **	13.41 **	1.28	-28.46 **	4.73	-10.88 **	18.45 **	7.57 **	9.94 **	5.29 **
13	$L_5 \times T_1$	6.92 **	2.38 *	15.81 **	15.64 **	0.92	-26.02 **	-6.85 *	-20.74 **	4.14 *	-10.43 **	-2.76	-6.88 **
14	$L_5 \times T_2$	5.87 **	2.33 *	15.81 **	15.64 **	-22.42 **	-38.26 **	-38.75 **	-47.89 **	-6.90 **	-21.55 **	-10.5 **	-14.29 **
15	$L_5 \times T_3$	8.9 **	5.62 **	19.29 **	19.12 **	-9.95 **	-36.94 **	-7.67 *	-21.44 **	17.74 **	4.05 *	6.35 **	1.85
16	$L_6 \times T_1$	-6.10 **	-6.14 **	-2.98 *	-3.12 *	37.42 **	21.95 **	53.54 **	30.65 **	11.03 **	7.09 **	25.14 **	19.84 **
17	$L_6 \times T_2$	-1.06	-2.05	3.28 *	3.14 *	54.03 **	52.76 **	51.54 **	28.95 **	6.94 **	5.67 **	23.48 **	18.25 **
18	$L_6 \times T_3$	-7.51 **	-8.73 **	-3.30 *	-3.44 **	25.92 **	4.90 *	53.57 **	30.67 **	15.11 **	8.04 **	26.24 **	20.90 **
19	$L_7 \times T_1$	3.98 **	2.16	9.42 **	9.27 **	12.99 **	-4.90 *	19.73 **	1.88	9.74 **	6.11 **	15.19 **	10.32 **
20	$L_7 \times T_2$	0.95	0.11	7.31 **	7.16 **	42.35 **	32.90 **	31.84 **	12.18 **	8.21 **	2.18	16.57 **	11.64 **
21	$L_7 \times T_3$	-1.10	-1.79	5.3 **	5.15 **	10.22 **	-12.49 **	28.11 **	9.01 **	14.09 **	13.78 **	16.30 **	11.38 **
22	$L_8 \times T_1$	2.55 *	1.60	6.95 **	6.8 **	10.38 **	-10.84 **	12.26 **	-4.48	9.87 **	4.83 **	13.81 **	8.99 **
23	$L_8 \times T_2$	0.46	0.42	5.84 **	5.69 **	41.06 **	25.64 **	24.64 **	6.05 *	9.35 **	1.94	16.30 **	11.38 **
24	$L_8 \times T_3$	3.55 **	3.37 **	9.26 **	9.11 **	-25.85 **	-43.3 **	-17.00 **	-29.37 **	15.70 **	13.51 **	16.02 **	11.11 **
25	$L_9 \times T_1$	4.32 **	4.13 **	7.97 **	7.82 **	28.81 **	13.38 **	42.75 **	21.47 **	9.00 **	7.89 **	17.13 **	12.17 **

26	$L_9 \times T_2$	0.96	0.16	5.56 **	5.41 **	50.83 **	48.19 **	47.02 **	25.09 **	10.28 **	6.54 **	21.55 **	16.4 **
27	$L_9 \times T_3$	-4.62 **	-5.63 **	-0.12	-0.26	24.27 **	2.75	50.43 **	28.00 **	15.38 **	13.28 **	20.17 **	15.08 **
28	$L_{10} \times T_1$	0.12	-0.68	4.25 **	4.1 **	56.07 **	19.22 **	50.1 **	27.72 **	22.25 **	13.23 **	22.93 **	17.72 **
29	$L_{10} \times T_2$	0.11	-0.10	5.30 **	5.15 **	32.52 **	10.64 **	9.76 **	-6.60 *	9.89 **	-0.48	13.54 **	8.73 **
30	$L_{10} \times T_3$	-0.04	-0.40	5.30 **	5.15 **	26.57 **	-7.97 **	34.73 **	14.64 **	16.76 **	11.08 **	13.54 **	8.73 **
	SE m ±	0.60	0.69	0.69	0.69	0.98	1.13	1.13	1.13	0.06	0.07	0.07	0.07
	CD at 5%	1.21	1.40	1.40	1.40	2.00	2.31	2.31	2.31	0.13	0.15	0.15	0.15
	CD at 1%	1.63	1.89	1.89	1.89	2.70	3.11	3.11	3.11	0.17	0.20	0.20	0.20

Table 5: Per cent heterosis over mid parent (MP), better parent (BP) and the commercial checks (CC) for growth and yield parameters in ridge gourd

Sl. No.	Crosses	Average fruit weight				Number of fruits per vine				Fruit yield per vine			
		MP	BP	CC1	CC2	MP	BP	CC1	CC2	MP	BP	CC1	CC2
1	$L_1 \times T_1$	-8.48 **	-24.21 **	-13.99 **	-19.62 **	3.86 *	-6.45 **	-17.39 **	-11.84 **	-6.94 **	-29.07 **	-28.76 **	-29.07 **
2	$L_1 \times T_2$	4.74 **	-11.02 **	-5.21 **	-11.42 **	3.97 *	-6.14 **	-17.54 **	-12.00 **	6.63 *	-16.51 **	-21.68 **	-22.03 **
3	$L_1 \times T_3$	19.72 **	-1.80 **	14.18 **	6.70 **	6.45 **	-3.77 *	-15.82 **	-10.16 **	24.00 **	-5.65 **	-3.98 *	-4.41 *
4	$L_2 \times T_1$	15.88 **	4.71 **	18.82 **	11.04 **	6.49 **	4.58 *	-4.12 *	2.32	23.44 **	13.66 **	14.16 **	13.66 **
5	$L_2 \times T_2$	16.69 **	8.52 **	15.6 **	8.03 **	-3.92 *	-5.89 **	-13.72 **	-7.92 **	12.44 **	6.60 **	0.00	-0.44
6	$L_2 \times T_3$	17.70 **	5.21 **	22.34 **	14.32 **	17.15 **	14.47 **	4.95 **	12.00 **	38.10 **	26.09 **	28.32 **	27.75 **
7	$L_3 \times T_1$	10.23 **	9.70 **	24.49 **	16.34 **	36.92 **	35.67 **	22.04 **	30.24 **	50.88 **	50.22 **	52.21 **	51.54 **
8	$L_3 \times T_2$	12.37 **	9.44 **	22.99 **	14.94 **	24.03 **	22.58 **	10.27 **	17.68 **	38.91 **	34.06 **	35.84 **	35.24 **
9	$L_3 \times T_3$	8.13 **	6.32 **	23.63 **	15.53 **	43.92 **	42.00 **	27.74 **	36.32 **	55.22 **	55.22 **	57.96 **	57.27 **
10	$L_4 \times T_1$	-18.70 **	-36.6 **	-28.06 **	-32.77 **	3.83	-10.27 **	-20.76 **	-15.44 **	-19.38 **	-43.17 **	-42.92 **	-43.17 **
11	$L_4 \times T_2$	-19.72 **	-35.94 **	-31.76 **	-36.23 **	0.10	-13.31 **	-23.84 **	-18.72 **	-22.37 **	-44.34 **	-47.79 **	-48.02 **
12	$L_4 \times T_3$	18.36 **	-8.51 **	6.38 **	-0.58	12.93 **	-1.97	-14.24 **	-8.48 **	27.95 **	-10.43 **	-8.85 **	-9.25 **
13	$L_5 \times T_1$	-5.34 **	-29.12 **	-19.56 **	-24.83 **	4.04	-10.36 **	-20.84 **	-15.52 **	-7.10 *	-36.56 **	-36.28 **	-36.56 **
14	$L_5 \times T_2$	-14.32 **	-34.45 **	-30.17 **	-34.75 **	-3.85	-16.98 **	-27.06 **	-22.16 **	-21.77 **	-45.75 **	-49.12 **	-49.34 **
15	$L_5 \times T_3$	2.76 **	-23.66 **	-11.24 **	-17.05 **	7.33 **	-7.11 **	-18.74 **	-13.28 **	4.49	-29.13 **	-27.88 **	-28.19 **
16	$L_6 \times T_1$	12.57 **	8.73 **	23.39 **	15.30 **	17.38 **	6.90 **	14.92 **	22.64 **	32.64 **	24.9 **	42.04 **	41.41 **
17	$L_6 \times T_2$	14.78 **	14.35 **	21.81 **	13.83 **	14.50 **	4.04 *	11.84 **	19.36 **	31.06 **	19.84 **	36.28 **	35.68 **
18	$L_6 \times T_3$	11.33 **	6.28 **	23.58 **	15.49 **	20.83 **	9.62 **	17.84 **	25.76 **	35.25 **	28.4 **	46.02 **	45.37 **
19	$L_7 \times T_1$	15.33 **	1.79 **	15.52 **	7.95 **	2.02	-1.27	-12.82 **	-6.96 **	16.92 **	0.44	0.88	0.44
20	$L_7 \times T_2$	21.73 **	10.48 **	17.69 **	9.98 **	9.32 **	6.06 **	-6.82 **	-0.56	32.62 **	16.98 **	9.73 **	9.25 **
21	$L_7 \times T_3$	14.76 **	0.23	16.54 **	8.91 **	7.85 **	4.80 *	-8.32 **	-2.16	23.47 **	5.22 **	7.08 **	6.61 **
22	$L_8 \times T_1$	17.61 **	1.73 **	15.45 **	7.88 **	5.35 *	-1.44	-12.97 **	-7.12 **	22.04 **	0.00	0.44	0.00
23	$L_8 \times T_2$	22.78 **	9.13 **	16.25 **	8.63 **	9.65 **	2.82	-9.67 **	-3.60 *	33.71 **	12.26 **	5.31 **	4.85 *
24	$L_8 \times T_3$	16.60 **	-0.17	16.08 **	8.48 **	7.93 **	1.46	-11.24 **	-5.28 **	24.60 **	1.30	3.10	2.64
25	$L_9 \times T_1$	12.19 **	5.80 **	20.07 **	12.20 **	5.99 **	0.00	-0.45	6.24 **	18.94 **	18.94 **	19.47 **	18.94 **
26	$L_9 \times T_2$	16.6 **	13.33 **	20.73 **	12.82 **	7.84 **	1.51	1.05	7.84 **	25.45 **	21.59 **	22.12 **	21.59 **
27	$L_9 \times T_3$	-9.46 **	-15.58 **	-1.83 *	-8.26 **	15.63 **	8.66 **	8.17 **	15.44 **	4.80 *	4.35 *	6.19 **	5.73 **
28	$L_{10} \times T_1$	27.56 **	7. 11 **	21.55 **	13.59 **	24.29 **	15.11 **	1.65	8.48 **	55.87 **	22.91 **	23.45 **	22.91 **
29	$L_{10} \times T_2$	25.35 **	8.04 **	15.09 **	7.55 **	6.43 **	-1.19	-13.19 **	-7.36 **	31.40 **	6.60 **	0.00	-0.44
30	$L_{10} \times T_3$	22.05 **	1.50 *	18.02 **	10.29 **	15.76 **	7.63 **	-5.85 **	0.48	38.67 **	9.13 **	11.06 **	10.57 **
	SE m ±	1.17	1.35	1.35	1.35	0.21	0.24	0.24	0.24	0.04	0.05	0.05	0.05
	CD at 5%	2.40	2.76	2.76	2.76	0.43	0.50	0.50	0.50	0.09	0.10	0.10	0.10
	CD at 1%	3.22	3.72	3.72	3.72	0.58	0.67	0.67	0.67	0.12	0.13	0.13	0.13

Table 6: Percent heterosis over mid parent (MP), better parent (BP) and the commercial checks (CC) for growth and yield parameters in ridge gourd

Sl. No.	Crosses	Fruit yield per plot				Fruit yield per ha				TSS				Vitamin C			
		MP	BP	CC2	CC2	MP	BP	CC1	CC2	MP	BP	CC1	CC2	MP	BP	CC1	CC2
1	$L_1 \times T_1$	-7.45 **	-30.21 **	-30.02 **	-30.24 **	-7.39 **	-30.16 **	-29.97 **	-30.16 **	-1.82	-3.58 *	-23.37 **	-12.73 **	-5.11 **	-16.81 **	-14.69 **	-6.96 **
2	$L_1 \times T_2$	7.17 *	-17.17 **	-22.64 **	-22.89 **	7.24 *	-17.17 **	-22.64 **	-22.85 **	-10.09 **	-19.20 **	-22.15 **	-11.34 **	8.65 **	-4.96 **	-2.17	6.69 **
3	$L_1 \times T_3$	25.69 **	-5.72 **	-4.03 *	-4.34 *	25.69 **	-5.68 **	-4.03 *	-4.30 *	14.93 **	3.85 **	-1.42	12.27 **	23.22 **	13.73 **	3.70 *	13.09 **
4	$L_2 \times T_1$	24.60 **	14.12 **	14.44 **	14.07 **	24.55 **	14.08 **	14.39 **	14.08 **	5.48 **	-1.53	-21.75 **	-10.88 **	-3.59 *	-9.59 **	-7.28 **	1.11
5	$L_2 \times T_2$	12.80 **	6.77 **	-0.27	-0.59	12.75 **	6.77 **	-0.27	-0.55	-17.49 **	-29.32 **	-31.91 **	-22.45 **	-1.59	-7.82 **	-5.11 **	3.48 *

6	$L_2 \times T_3$	39.73 **	27.15 **	29.42 **	29.01 **	39.8 **	27.21 **	29.42 **	29.07 **	-11.41 **	-23.55 **	-27.44 **	-17.36 **	17.91 **	17.09 **	6.77 **	16.43 **
7	$L_3 \times T_1$	52.78 **	52.15 **	53.9 **	53.4 **	52.78 **	52.08 **	53.9 **	53.47 **	26.37 **	17.65 **	-6.50 **	6.48 **	-5.19 **	-11.21 **	-8.94 **	-0.70
8	$L_3 \times T_2$	40.79 **	35.43 **	36.98 **	36.55 **	40.68 **	35.33 **	36.94 **	36.56 **	21.43 **	4.01 **	0.20	14.12 **	-5.84 **	-12.03 **	-9.45 **	-1.25
9	$L_3 \times T_3$	57.77 **	57.27 **	60.08 **	59.57 **	57.81 **	57.39 **	60.13 **	59.69 **	9.95 **	-5.35 **	-10.16 **	2.31	3.11	2.10	-6.90 **	1.53
10	$L_4 \times T_1$	-20.18 **	-44.7 **	-44.55 **	-44.72 **	-20.18 **	-44.7 **	-44.55 **	-44.7 **	6.68 **	6.14 **	-15.65 **	-3.94 *	-13.43 **	-14.94 **	-12.77 **	-4.87 **
11	$L_4 \times T_2$	-23.94 **	-46.22 **	-49.77 **	-49.93 **	-23.99 **	-46.22 **	-49.77 **	-49.91 **	-17.63 **	-25.11 **	-27.85 **	-17.82 **	-3.16 *	-4.96 **	-2.17	6.69 **
12	$L_4 \times T_3$	29.44 **	-10.72 **	-9.12 **	-9.41 **	29.50 **	-10.63 **	-9.070 **	-9.32 **	8.90 **	-0.43	-5.49 **	7.64 **	-2.82	-6.58 **	-7.54 **	0.84
13	$L_5 \times T_1$	-6.98 *	-37.84 **	-37.67 **	-37.87 **	-6.98 *	-37.84 **	-37.67 **	-37.84 **	-1.44	-6.82 **	-16.67 **	-5.09 **	-4.10 *	-9.71 **	-7.41 **	0.97
14	$L_5 \times T_2$	-22.71 **	-47.40 **	-50.87 **	-51.03 **	-22.77 **	-47.40 **	-50.87 **	-51.01 **	-15.75 **	-18.78 **	-21.75 **	-10.88 **	-1.45	-7.32 **	-4.60 **	4.04 *
15	$L_5 \times T_3$	4.87	-30.17 **	-28.92 **	-29.15 **	5.01	-30.09 **	-28.87 **	-29.07 **	-13.44 **	-15.85 **	-20.12 **	-9.03 **	7.87 **	7.56 **	-1.92	6.96 **
16	$L_6 \times T_1$	33.63 **	25.48 **	43.31 **	42.85 **	33.68 **	25.52 **	43.35 **	42.96 **	30.79 **	22.76 **	-2.44	11.11 **	2.73 *	2.35	5.87 **	15.46 **
17	$L_6 \times T_2$	32.58 **	20.51 **	37.63 **	37.19 **	32.48 **	20.47 **	37.58 **	37.20 **	-4.16 *	-17.3 **	-20.33 **	-9.26 **	-10.15 **	-10.37 **	-7.28 **	1.11
18	$L_6 \times T_3$	36.4 **	29.01 **	47.34 **	46.87 **	36.50 **	29.05 **	47.39 **	46.98 **	12.35 **	-2.57	-7.52 **	5.32 **	7.35 **	0.99	4.47 **	13.93 **
19	$L_7 \times T_1$	17.86 **	0.46	0.73	0.41	17.79 **	0.46	0.73	0.46	-12.59 **	-19.7 **	-23.78 **	-13.19 **	-6.34 **	-6.45 **	-3.70 *	5.01 **
20	$L_7 \times T_2$	34.08 **	17.76 **	9.99 **	9.64 **	34.08 **	17.76 **	9.99 **	9.69 **	-0.64	-1.27	-4.88 **	8.33 **	-18.73 **	-18.73 **	-16.35 **	-8.77 **
21	$L_7 \times T_3$	24.24 **	5.22 *	7.10 **	6.76 **	24.12 **	5.23 *	7.06 **	6.76 **	-19.27 **	-19.27 **	-23.37 **	-12.73 **	-2.11	-7.69 **	-4.98 **	3.62 *
22	$L_8 \times T_1$	23.55 **	0.23	0.50	0.18	23.54 **	0.27	0.55	0.27	-10.75 **	-12.50 **	-27.44 **	-17.36 **	8.99 **	2.62	5.24 **	14.76 **
23	$L_8 \times T_2$	35.06 **	12.66 **	5.22 *	4.89 *	35.06 **	12.66 **	5.22 *	4.94 *	2.49	-4.64 **	-8.13 **	4.63 **	-17.15 **	-22.08 **	-19.8 **	-12.53 **
24	$L_8 \times T_3$	25.61 **	1.35	3.16	2.83	25.67 **	1.44	3.21	2.93	-22.37 **	-27.19 **	-30.89 **	-21.30 **	1.40	1.12	-7.79 **	0.56
25	$L_9 \times T_1$	20.03 **	19.97 **	20.30 **	19.92 **	19.93 **	19.93 **	20.26 **	19.93 **	10.89 **	7.43 **	-8.94 **	3.70 *	-3.25 *	-14.82 **	-12.64 **	-4.74 **
26	$L_9 \times T_2$	26.89 **	22.65 **	22.82 **	22.43 **	26.89 **	22.6 **	22.82 **	22.49 **	-5.16 **	-10.76 **	-14.02 **	-2.08	1.98	-10.42 **	-7.79 **	0.56
27	$L_9 \times T_3$	5.40 **	4.55 *	6.42 **	6.08 **	5.35 **	4.59 *	6.42 **	6.12 **	-27.60 **	-31.48 **	-34.96 **	-25.93 **	-3.63 *	-10.64 **	-18.52 **	-11.14 **
28	$L_{10} \times T_1$	58.77 **	24.09 **	24.43 **	24.03 **	58.71 **	24.04 **	24.38 **	24.04 **	-23.77 **	-24.55 **	-40.04 **	-31.71 **	-9.92 **	-15.19 **	-13.03 **	-5.15 **
29	$L_{10} \times T_2$	33.39 **	7.02 **	-0.05	-0.37	33.25 **	6.97 **	-0.09	-0.37	8.62 **	-1.69	-5.28 **	7.87 **	4.49 **	-1.86	1.02	10.17 **
30	$L_{10} \times T_3$	40.94 **	9.59 **	11.55 **	11.19 **	41.02 **	9.64 **	11.55 **	11.24 **	-7.53 **	-15.85 **	-20.12 **	-9.03 **	-2.67	-3.08	-11.62 **	-3.62 *
	SE m ±	0.42	0.48	0.48	0.48	0.21	0.24	0.24	0.24	0.06	0.07	0.07	0.07	0.12	0.13	0.13	0.13
	CD at 5%	0.86	1.00	1.00	1.00	0.43	0.50	0.50	0.50	0.13	0.15	0.15	0.15	0.24	0.27	0.27	0.27
	CD at 1%	1.16	1.34	1.34	1.34	0.58	0.67	0.67	0.67	0.18	0.20	0.20	0.20	0.32	0.37	0.37	0.37

MP= Mid parent heterosis
BP= Better parents heterosis
CC 1= Heterosis over commercial check (Naga F_1)
CC 2= Heterosis over commercial check (Arka Vikram)

L_1: IC0648090	L_2: Rajanukunte Local	L_3: Hireharukuni Local	L_4: IC110893	L_5: IC23255
L_6: IC92700 T_1: Arka Prasan	L_7: IC0648092 T_2: Arka Sujat	L_8: IC201145 T_3: Arka Sumeet	L_9: Budihal Local	L_{10}: IC0648094

Conclusion

The hybrid Hireharukuni Local × Arka Sumeet emerged as the most promising, showing the highest heterotic advantage and excelling in number of fruits per vine and fruit length. The second-best hybrid Hireharukuni Local × Arka Prasan, recorded significant standard heterosis for fruit yield per vine. The third-best hybrid IC92700 × Arka Sumeet, showed notable heterosis and superiority in early flowering and fruit weight. Overall, these hybrids hold considerable promise for enhancing productivity in future breeding programs.

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