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Analyzing the Yield and Attributional Features of the F_1 Hybrids Produced by the Parental Lines and their Tomato-producing Parents (*Solanum lycopersicon* L.)

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ABSTRACT: The current study set out to collect information about the genetic development of tomatoes based on the individual traits of the parents and their combinations. A line × testers mating strategy, consisting of eleven lines and three testers, produced 33 hybrids. At the Main Experimental Station (MES), Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) India, the genotypers were assessed in Randomized Complete Block Design (RBD) with three replications for eighteen yield and yield attributing traits during Rabi 2020-21 (Y_1) and 2021-22 (Y_2). The study evident that highly significant differences were observed for most of the traits under study. Based on *per se* performance, parent L_{11} (1.84 Kg) exhibited highest fruit yield per plant followed by T_3 (1.84 Kg). The *per se* performance of crosses *i.e.* $L_9 \times T_2$ (2.88 Kg) followed by $L_{11} \times T_1$ (2.87 Kg), $L_4 \times T_1$ (2.86 Kg) and $L_{11} \times T_2$ (2.74 Kg) were produced significantly higher fruit yield per plant than the general mean. These hybrids may be exploited as new variety after selection and subjected to multi-locational trials for their release as cultivation on commercial scale.

Keywords: Evident, reciprocals, yield, hybrids.

INRODUCTION

The tomato belongs to the Solanaceae family and the genus Solanum, with chromosome number 2n=2x=24. With a weak woody stem that frequently scrambles over other plants, it is planted as an annual herbaceous plant that can reach heights of up to 1-3 metres. It is a crop plant that reproduces sexually and has a tap root, perfect or complete blooms, and hypogynous flower. It is a day-neutral plant that forms compound inflorescences with four to eight blooms in each cluster. The stigma is surrounded by a thin protective anther cone that promotes self-pollination. *Solanum lycopersicum* was the name Linnaeus gave to the tomato when he classified it in the genus Solanum in 1753. It was given the name *Lycopersicon esculentum* by Philip Miller in 1768, who also assigned it to its own genus.

Western Southern America is the native home of all tomato species (Rick, 1976). The ancestor of the tomato was probably the wild cherry tomato, also known as *Lycopersicon esculentum* var. *cerasiforme*. Tomato varieties that are indeterminate and determinate are frequently recognised. Determinate or bush varieties grow to their highest point and harvest their entire yield at once. Because of their greater adaptability and versatility, indeterminate types of tomatoes develop into vines that never reach their maximum height and continue to produce flowers and fruits. They are grown both outdoors and indoors all over the world, ranking second in importance only to potatoes in many nations, including India. India had a total area of 0.789 million hectares and produced 19.759 million tonnes at a productivity of 25.042 tonnes per hectare (Anonymous, 2018).

The top tomato-growing states in India include Karnataka, West Bengal, Maharashtra, Uttar Pradesh, Haryana, Punjab, Gujarat, and Bihar. The tomato is regarded as "Poor man's Orange" and is always used as "Protective Food." Fruits from tomatoes are consumed either raw or cooked. Large amounts of tomato are used to make a variety of processed foods such soup, juice, ketchup, puree, paste, and powder. Tomato soup is a tasty starter and is said to be a helpful treatment for persons with constipation. In addition to providing vitamin C, it gives meals a range of colours and flavours. Ripe tomatoes are used as a fresh salad vegetable whereas green tomatoes are utilised in pickles and preserves.

Tomatoes are renowned for their exceptional nutritional content, which is stated as follows: each 100g of tomato fruit that can be eaten has 93.10g of moisture, 3.60g of carbohydrates, 1.90g of protein, 0.10g of fat, 0.60g of minerals, 0.70g of fibres, 320 I.U. of vitamin "A," and 31mg of vitamin "C" (Ascorbic acid). Additionally beneficial as a medicine, tomatoes. Both the pulp and the juice, which both promote gastric output and cleanse the blood, are quickly metabolised. Oral cancer,

sour mouth, and other diseases, it is said, can be avoided with this. One of the healthiest veggies for keeping our colon and stomach healthy is this one. Vegetable supplies are insufficient compared to the population's daily needs given the population's on-going growth. Though many genetic studies on tomatoes have been conducted, leading to the development of numerous tomato varieties and hybrids. Phenotypically superior lines may produce subpar recombinants in the segregating generations, so choosing ideal parents for hybridization only on the basis of phenotypic performance is not a sound procedure. The choice of parents must consequently be made based on their genetic potential.

MATERIALS AND METHODS

The present investigation was carried out at Main Experimental Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.), India, during *Rabi*, 2020-21 (Y_1) and 2021–22 (Y_2). The experimental farm falls under humid subtropical climate and is located between 24.47° and 26.54°N latitude and 81.84° and 83.58°E longitude at an altitude of 98 m above mean sea level.

The experimental materials comprised of ten promising varieties of tomato selected on the basis of genetic variability from the germplasm stock maintained in the Department of Vegetable Science. The selected parental lines *i.e* NDT-Sel-1, NDT-Sel-2, NDT-Sel-3, Narendra Tomato-4, NDT-Sel-5, NDT-Sel-6, Narendra Tomato-7, NDT-Sel-8, NDT-Sel-9, NDT-Sel-10 and T_6 were crossed Arka vikash, Kashi chayan and Kashi aman in all possible cross combinations during *Rabi* season of 2019-20 to get 33 F_1's for the study of mean performance of parental line and their resultant F_1.

The experiments were grown in a Randomized Complete Block Design (RBD) with three replications to evaluate the performance of 33 F_1 hybrids and their 14 parental lines (11 line × 3 testers) of Tomato. The crop was sown in single row spaced at 60 cm apart with a plant to plant spacing of 50 cm.

A total of 18 economic and quality variables were observed, including days to 50% flowering, days to first fruit harvest, plant height (cm), number of primary branches per plant, number of fruits per cluster, number of fruits per plant, average fruit weight (g), pericarp thickness (mm), number of locules per fruit, polar diameter of fruit (cm), equitorial diameter of fruit (cm), tss (°Brix), titrable acidity (%), and as (mg/100g fresh fruit). A method provided by Panse and Sukhatme was used to evaluate the per se performance of parents and hybrids. for eighteen yield and yield-contributing traits experimental variance analysis.

RESULTS AND DISCUSSION

Selection of suitable parents and proper breeding methodology are basic steps for the improvement of yield and attributing traits. The selection of parents having high *per se* performance would be of merit in producing better hybrids and hence the parents selected for crossing programme were evaluated based on their *per se* performances. The most important trait fruit yield per plant and other quality traits result for pooled data are discussed below.

Perusal of Table 1 Pooled data revealed that the mean squares due to parent, line and crosses were found highly significant for all the traits. Tester showed highly significant for all character except days to 50% flowering, days to first fruit harvest, length of fruit and fruit diameter. The mean squares due to parents *vs.* hybrids also found significant for all the traits studied except for days to first fruit harvest, plant height, pericarp thickness, number of fruit per cluster, total sugar.

Perusal of (Table 2) in pooled, the results revealed significant variation among parents for the characters. Days to 50% flowering was ranged from 34.33 (T_3) and 38.00 days (NDT-Sel-1). Among hybrids, it ranged from 31.33 cm ($L_8 \times T_3$) to 38.67 cm ($L_1 \times T_2$) with an average of 32.38 cm. Among 33 hybrids, 14 hybrids showed significant superior mean performance than the standard check Kashi aman for days to 50% flowering and days to first fruit harvest among parent (59.00) days L_8 to (66.33) T_2 and 71.00 days ($L_7 \times T_1$) to (86.00) days $L_6 \times T_3$ in hybrid and average 63.29 days. Among 33 hybrids, 24 hybrids significantly superior for days to frist fruit harvest when compared to best check kashi aman (63.83). Longer harvesting period was desirable for getting higher yields. The results are in accordance with the results of Ravindra Kumar *et al.,* (2012) and Shankar *et al.* (2014).

Plant height among parents ranged from (76.96) cm in L_{10} and (106.63) cm in L_4. The average for hybrids was 89.05 cm, while the range for $L_6 \times T_1$ to $L_5 \times T_3$ hybrids was 80.75 cm to 98.92 cm. Maximum plant heights were measured for three hybrids: $L_5 \times T_3$ (98.92), $L_4 \times T_3$ (98.82), and $L_4 \times T_2$ (98.28). Results are confirmed with earlier reports Sujeet Kumar and Ramanjini Gowda (2016). The numbers of primary branches per plant parents ranged from (3.40) in L_{10} to (6.16) in T_2. Among the crosses, it ranged from (3.61) in $L_7 \times T_1$ to (5.76) in $L_6 \times T_3$ with an average of 4.41. Among 33 hybrids, 15 hybrids showed significant superior mean performance than the standard check Kashi aman for number of branches per plant. The present result getting support from the findings of Shankar *et al.*, (2014) and Sujeetkumar and Ramanjinigowda (2016). Pericarp thickness of fruit it ranged from (0.29) cm L_2 to (0.68) cm L_6 in parent, among the hybrid (0.37) cm $L_2 \times T_3$ to (0.59) cm $L_7 \times T_2$ with an average of 0.49. Among 33 hybrids, 27 hybrids showed significant superior mean performance than the standard check Kashi aman for pericarp thickness. The number of fruit per clusters ranged from (3.50) in L_9 to 4.88 L_1. Among hybrids, this character was ranged from (3.12) in $L_9 \times T_3$ to (4.53) in $L_7 \times T_3$ with an average of 4.03 hybrids showed significant superior mean performance than the standard check Kashi aman for fruit per clusters. Results for number of fruit per clusters are in agreement with result of Vilas *et al.*, (2015) Number of fruits per plant was ranged from (14.85) in L_3 to (36.73) in T_2 with an average of 21.76 among parents.

In hybrids, the number of fruits per plant was ranged from 23.38 in ($L_3 \times T_3$) to 37.65 in ($L_{11} \times T_1$) with an average of 28.42. Among 33 hybrids, 9 hybrids were showed significantly more number of fruits per plant in comparison with best check Kashi aman. These results are in agreement with the previous findings of Vilas *et al.,* (2015); Sujeet Kumar and Ramanjini Gowda (2016). Higher mean value for number of fruits per plant was recorded in (37.65) in $L_{11} \times T_1$, (34.53) in $L_{11} \times T_2$ and (33.62) in $L_{11} \times T_3$. Five hybrids, $L_1 \times T_1$ (95.96g), $L_1 \times T_1$ (95.13g), $L_9 \times T_2$, (91.51g) $L_9 \times T_3$, (89.57g) and (89.23g) $L_2 \times T_2$ recorded higher fruit weight compared to best check kasha aman (75.63g). Gul *et al.* (2010); Ravindra Kumar *et al.* (2012); Sujeet and Ramanjini Gowda (2016) are also reported the similar results. Polar diameter of fruit was ranged from (5.35 cm) in T_3 to (6.46 cm) L_7 in parent and (6.58 cm) $L_4 \times T_3$ to (4.90 cm) $L_3 \times T_3$ in hybrid, with an average of 5.71 cm. Twenty three hybrids were significant and superior with respect to polar diameter (cm) compared to best check kashi aman (5.35 cm). Equitorial diameter of fruit was ranged from (3.46 cm) $L_6 \times T_2$ to (5.44 cm) $L_2 \times T_2$ in hybrid and (4.15 cm) L_6 to (5.45 cm) L_2 in parent, with an average of 4.54 cm. Twenty five hybrids were significant and superior with respect to equitorial diameter (cm) compared to best check kashi aman (5.35 cm). The results are in close conformity with the findings of Gul *et al.* (2010); Sunil *et al.* (2013). The total fruit yield per plant was high in (3.15 kg) in T_2. Among hybrids, this character was ranged from (1.72 kg) in $L_{10} \times T_1$ and (2.90 kg) $L_4 \times T_1$ with an average mean 2.06 kg. Five hybrids are high yield found (2.90 kg) in $L_4 \times T_1$, (2.88 kg) $L_9 \times T_2$, (2.87 kg) in $L_{11} \times T_1$, (2.81 kg) in $L_1 \times T_1$, (2.74 kg) in $L_{11} \times T_2$. The present findings are in accordance with the results of Basavaraj *et al.* (2016); Sujeetkumar and Ramanjini Gowda (2016). Marketable fruit yield per plant ranged from parent (0.84 kg) in L_3 and (1.43) in T_2. Among hybrids, this character was ranged from (0.92 kg) in $L_3 \times T_1$ to (1.66 kg) in $L_{10} \times T_2$ with an average mean 1.12 kg. Best hybrids $L_{10} \times T_2$ (1.66 kg), $L_{10} \times T_1$ (1.55 kg), $L_{10} \times T_3$ (1.30 kg), $L_{11} \times XT_3$ (1.25) were recorded high marketable fruit yield per plant compared to best check kasha aman (1.04). TSS ranged from parent (5.22) in L_{11} to (6.70) in L_3, with a mean 5.42. Among 33 hybrids, 19 hybrids showed significantly superior TSS (°Brix) compared to best check kashi aman (5.42). Present findings are in accordance with the reports of Shankar *et al.* (2014); Basavaraj *et al.* (2016). Titrable acidity ranged from (0.36) in T_3 to(0.55) in L_7 with a mean 0.45 and hybrids ranged from (0.35) $L_{10} \times T_1$ to (0.57) $L_7 \times T_2$ and mean 0.43.All hybrids showed significant for all character except cross $L_{10} \times T_1$ is non-significant compare to the check variety . Ascorbic acid (mg/100g) content is nutritionally an important constituent. Among the parent ranged from (17.23) in T_3 and (22.50) L_9 genotypes are generally richer in ascorbic acid content. Among hybrids, it ranged from (16.62) $L_1 \times T_1$ in (21.8) $L_9 \times T_2$ with an average of 19.07. Twenty nine best hybrids *viz.*, were showed significant and superior values for ascorbic acid content compared best check Kashi aman the results are in agreement the results of Shankar *et al.* (2014); Basavaraj *et al.* (2016). Total sugar ranged from (3.28) in L_3 to (3.94) in T_2 with a mean (3.59) and hybrids ranged from (3.38) $L_9 x T_2$ to (3.83) $L_4 \times T_2$ and mean 3.60. All hybrids showed significant for all character except cross $L_7 \times T_2$, $L_9 \times T_2$, $L_9 \times T_3$, $L_{10} \times T_3$ is non-significant compare to the check variety. Among parents lycopene (mg/100g) ranged from (2.50) in L_8 and (3.7) in T_2. Among hybrids, it ranged from (2.39) $L_4 \times T_3$ in to (3.61) in $L_4 \times T_2$ with an average of 2.93. Thirteen best hybrids *viz.*, were showed significant and superior values for lycopene compared best check Kashia aman (3.13). The present results are getting support from the findings of Shankar *et al.* (2014); Basavaraj *et al.* (2016).

Table 1: Analysis of variance (Mean sum of squire) for eighteen characters of line × tester set of crosses and their parents in tomato (Y_1=2020-21 and Y_2=2021-22) & Pooled.

Source of variation	Year	DF	Days to 50% flowering	Days to First Fruit harvest	Plant height	Primary Branches/Plant	Pericarp thickness	Locules/Fruit	Fruit /Cluster	Fruit/Plant	Avg. Fruit weight
Replicates	Y_1	2	14.05	7.37	113.55**	0.22	0.00	0.19**	0.03	4.64	866.75**
	Y_2	2	15.24**	3.77	42.12	0.325	6.80	235.99**	0.002*	0.19**	1.57**
	Pooled	2	18.52**	0.76	73.26**	0.004	0.001*	0.118**	0.460**	5.522*	482.05**
Treatments	Y_1	46	17.82	22.89	220.62**	2.27**	0.03**	0.60**	0.55**	110.68**	484.40**
	Y_2	46	13.56**	22.86**	151.53**	1.475**	116.98**	527.68**	0.025**	0.63**	0.41**
	Pooled	46	24.84**	23.64**	164.80**	1.706**	0.026**	0.568**	0.435**	112.522**	503.69**
Parents	Y_1	13	22.23	11.05	370.61**	3.09**	0.06**	1.19**	0.77**	190.72**	1037.67**
	Y_2	13	17.15**	16.49**	269.77**	1.784**	194.68**	1076.08**	0.052**	1.18**	0.47**
	Pooled	13	37.80**	15.47**	294.80**	2.027**	0.057**	1.147**	0.537**	191.183**	1055.93**
Parents (Line)	Y_1	10	26.96	2.76	446.72**	0.41**	0.08**	1.47**	0.85**	60.35**	1288.70**
	Y_2	10	21.85**	21.27**	324.24**	0.455**	38.84**	1340.04**	0.065**	1.32**	0.45**
	Pooled	10	45.00**	15.31**	379.72**	0.392**	0.071**	1.358**	0.546**	48.053**	1313.12**
Parents (Testers)	Y_1	2	4.11	16.78	174.13**	7.27**	0.01**	0.38**	0.73**	23.74**	78.65
	Y_2	2	2.11	0.78	131.50**	1.085**	19.80**	79.02*	0.010**	1.05**	0.79**
	Pooled	2	5.78**	5.25	1.763**	1.756**	0.011**	0.670**	0.762**	20.601**	78.79*
Parents (L vs T)	Y_1	1	11.09	82.43	2.40	21.52**	0.02**	0.01	0.02	1828.36**	445.42**
	Y_2	1	0.21	0.09	1.67	16.471**	2102.76**	430.58**	0.007**	0.04	0.01
	Pooled	1	29.88**	37.51**	0.02	18.921**	0.011**	0.00	0.00	1963.643**	438.24**
Parents vs	Y_1	1	0.02	12.11	1.01	6.28**	0.00	1.88**	0.41*	1264.98**	391.66**

Crosses	Y_2	1	13.65*	5.4	59.64	5.131**	1349.72**	615.61**	0.00	6.41**	1.03**
	Pooled	1	52.34***	3.25	11.27	5.693**	0.00	3.826**	0.03	1306.616**	497.29**
Crosses	Y1	32	16.58	28.04	166.55**	1.81**	0.02**	0.32**	0.47**	42.10**	262.53**
	Y2	32	12.09**	25.99**	106.37**	1.236**	46.89**	302.14**	0.014**	0.22**	0.37**
	Pooled	32	18.71**	27.60**	116.78**	1.451**	0.014**	0.231**	0.406**	43.251**	279.55**
Error	Y1	92	3.35	8.18	18.25	0.08	0.00	0.03	0.08	2.31	25.87
	Y2	92	3.03	2.55	21.73	0.16	2.86	23.61	0.00	0.01	0.08
	Pooled	92	0.07	1.89	10.77	0.06	0.00	0.01	0.04	1.33	22.38

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Source of variation	Year	DF	Length of Fruit	Diameter of Fruit	Total fruit yield/Plant	Marketable fruit yield/Plant	Total soluble solids	Titrable Acidity	Ascorbic acid content	Total Sugar	Lycopene
Replicates	Y_1	2	0.21	0.19	0.88**	0.00	0.11	0.002*	0.84*	0.036**	0.097*
	Y_2	2	1.62**	1.19**	0.00	0.30**	0.11	0.00	2.41*	0.09*	0.02
	Pooled	2	0.681**	0.203**	0.521**	0.00	0.07	0.00	0.591*	0.032*	0.02
Treatments	Y_1	46	0.85**	0.75**	0.94**	0.14**	1.26**	0.019**	7.65**	0.039**	0.363**
	Y_2	46	0.65**	0.71**	0.10**	0.98**	1.20**	0.01**	6.66**	0.13**	0.53**
	Pooled	46	0.649**	0.724**	0.950**	0.1115**	1.223**	0.0144**	6.381**	0.063**	0.387**
Parents	Y_1	13	0.86**	0.88**	1.46**	0.19**	0.71**	0.028**	10.50**	0.061**	0.587**
	Y_2	13	0.68**	0.81**	0.12**	1.48**	0.61**	0.01**	7.96**	0.19**	0.34**
	Pooled	13	0.605**	0.833**	1.464**	0.1424**	0.653**	0.0184**	8.575**	0.100**	0.402**
Parents (Line)	Y_1	10	0.83**	1.03**	0.39**	0.15**	0.60**	0.028**	8.86**	0.039**	0.203**
	Y_2	10	0.72**	1.01**	0.14**	0.31**	0.57**	0.01**	8.85**	0.18**	0.17**
	Pooled	10	0.583**	1.016**	0.344**	0.1398**	0.588**	0.0180**	8.384**	0.079**	0.144**
Parents (Testers)	Y_1	2	0.03	0.12	1.39**	0.31**	0.24*	0.00	6.35**	0.120**	0.757**
	Y_2	2	0.28	0.12	0.06**	1.37**	0.07	0.00	1.99	0.23**	0.07
	Pooled	2	0.12	0.11	1.370**	0.1180**	0.143**	0.0007*	3.095**	0.173**	0.275**
Parents (L vs T)	Y_1	1	2.87**	0.86**	12.26**	0.40**	2.72**	0.084**	35.20**	0.162**	4.084**
	Y_2	1	1.01**	0.17	0.10**	13.39**	1.99**	0.03**	11.07**	0.17	2.53**
	Pooled	1	1.795**	0.444**	12.853**	0.2167**	2.324**	0.0574**	21.444**	0.169**	3.246**
Parents vs Crosses	Y_1	1	3.04**	0.88**	10.77**	0.05*	17.95**	0.014**	28.82**	0.055**	0.274**
	Y_2	1	4.12**	1.43**	0.05*	12.79**	16.26**	0.00	16.04**	0.02	0.74**
	Pooled	1	3.573**	1.139**	11.727**	0.0438**	17.109**	0.0036**	21.942**	0.00	0.471**
Crosses	Y_1	32	0.77**	0.70**	0.42**	0.12**	0.96**	0.015**	5.84**	0.029**	0.275**
	Y_2	32	0.52**	0.65**	0.09**	0.41**	0.97**	0.01**	5.83**	0.11**	0.60**
	Pooled	32	0.575**	0.666**	0.404**	0.1011**	0.958**	0.0132**	5.003**	0.050**	0.379*
Error	Y_1	92	0.12	0.07	0.04	0.01	0.06	0.00	0.22	0.00	0.03
	Y_2	92	0.12	0.08	0.01	0.04	0.06	0.00	0.70	0.02	0.03
	Pooled	92	0.06	0.04	0.03	0.00	0.03	0.00	0.18	0.01	0.02

Table 2: Mean performance, general mean, range, coefficient of variation, critical difference and standard error for eighteen characters of line × tester set of 33 F1's and their 14 parents (Y_1=2020-21 and Y_2=2021-22) and Pooled.

Sr. No.	Genotypes	Days to 50% flowering			Days to first fruit harvest			Plant height			No. of primary branches per plant		
	Crosses	Y_1	Y_2	Pooled	Y_1	Y_2	Pooled	Y_1	Y_2	Pooled	Y_1	Y_2	Pooled
1.	L1×T1	35.33	36.00	35.50	63.67	60.00	62.17	85.16	82.48	83.82	3.88	3.80	3.84
2.	L1×T2	31.33	32.33	31.50	65.33	65.67	65.83	100.21	87.50	93.86	5.81	5.70	5.75
3.	L1×T3	32.67	33.67	32.50	65.00	66.00	65.33	97.84	95.84	96.84	4.83	4.73	4.78
4.	L2×T1	31.67	32.67	31.50	62.67	63.33	63.00	83.80	82.56	83.18	2.91	3.52	3.22
5.	L2×T2	34.00	35.00	34.50	71.00	70.67	70.50	97.58	84.59	91.08	4.67	4.58	4.62
6.	L2×T3	33.33	33.67	31.50	63.67	63.67	64.17	94.39	92.61	93.50	5.82	5.70	5.76
7.	L3×T1	31.67	33.00	31.50	63.00	62.00	62.17	80.68	82.47	81.57	3.88	4.10	3.99
8.	L3×T2	32.33	33.33	31.50	62.00	64.33	64.33	81.45	82.52	81.98	4.85	4.75	4.80
9.	L3×T3	32.33	33.33	30.50	63.00	61.00	60.83	85.36	85.74	85.55	5.82	5.70	5.76
10.	L4×T1	31.67	33.00	34.50	62.67	65.00	65.17	98.58	96.68	97.63	3.88	3.80	3.84
11.	L4×T2	32.33	33.00	35.50	63.00	61.33	60.83	98.22	98.34	98.28	4.52	4.43	4.47
12.	L4×T3	32.33	33.33	34.50	63.67	63.67	63.50	100.40	97.23	98.82	4.84	4.74	4.79
13.	L5×T1	34.67	35.00	37.00	62.33	62.33	62.67	91.85	88.15	90.00	3.88	4.02	3.95
14.	L5×T2	34.33	35.33	36.00	63.33	64.33	63.67	95.39	93.85	94.62	4.35	4.52	4.43
15.	L5×T3	31.33	32.67	34.50	61.67	62.67	62.50	100.21	97.63	98.92	4.85	4.75	4.80
16.	L6×T1	32.67	33.33	34.50	62.67	63.33	63.17	80.24	81.26	80.75	3.87	3.79	3.83
17.	L6×T2	33.33	34.33	35.50	64.00	65.00	64.33	84.42	82.51	83.47	4.58	4.54	4.56
18.	L6×T3	29.00	30.00	31.50	74.67	72.33	73.67	87.60	84.55	86.08	5.82	5.70	5.76
19.	L7×T1	30.00	31.33	32.50	62.00	62.67	62.50	80.54	82.39	81.47	3.52	3.71	3.61
20.	L7×T2	30.67	31.67	33.50	61.67	62.00	61.83	83.69	84.55	84.12	5.72	5.61	5.66
21.	L7×T3	30.67	31.67	33.50	62.67	63.00	63.33	86.93	82.40	84.67	3.54	3.73	3.64
22.	L8×T1	27.67	28.67	30.50	60.00	60.67	60.50	80.81	88.53	84.67	4.53	4.04	4.29

23.	L8×T2	28.67	30.00	31.00	57.00	57.33	56.83	86.66	92.62	89.64	5.14	4.68	4.91
24.	L8×T3	29.67	30.67	32.50	63.00	63.33	63.50	90.51	80.66	85.58	5.46	4.35	4.91
25.	L9×T1	31.33	32.00	32.50	64.00	64.00	63.83	80.57	83.57	82.07	3.88	3.75	3.82
26.	L9×T2	31.33	33.00	34.50	62.67	63.33	63.17	98.86	85.84	92.35	4.85	4.75	4.80
27.	**L9×T3**	32.33	33.33	35.50	58.33	58.33	57.83	86.93	81.65	84.30	4.53	4.45	4.49
28.	**L10×T1**	29.00	31.33	30.50	62.00	64.67	62.17	80.24	82.86	81.55	3.72	3.65	3.68
29.	**L10×T2**	25.67	28.00	26.50	62.67	62.67	61.17	81.15	86.06	83.60	4.54	4.43	4.49
30.	**L10×T3**	32.33	33.33	34.50	63.67	60.00	62.33	86.33	92.22	89.27	5.18	4.74	4.96
31.	**L11×T1**	31.00	32.00	33.50	62.67	64.00	63.83	97.73	92.38	95.05	4.86	4.40	4.63
32.	**L11×T2**	25.33	28.00	26.00	63.67	65.00	64.67	97.73	94.51	96.12	3.87	4.07	3.97
33.	**L11×T3**	28.00	29.33	30.50	59.67	60.00	60.00	97.61	98.39	98.00	5.47	4.60	5.04
1	**L1**	34.67	36.33	33.00	63.67	63.67	63.00	98.21	96.34	97.27	4.33	4.37	4.35
2	**L2**	35.67	37.33	39.00	63.00	63.33	63.50	90.96	86.33	88.65	4.17	3.68	3.92
3	**L3**	27.67	29.67	26.00	61.33	61.00	60.67	75.45	78.52	76.98	3.87	3.65	3.76
4	**L4**	30.33	32.33	30.00	63.00	63.00	62.50	106.84	106.42	106.63	3.47	3.47	3.47
5	**L5**	28.67	30.67	28.00	63.00	65.67	65.50	104.83	103.89	104.36	3.53	3.38	3.46
6	**L6**	33.00	35.00	32.00	64.00	61.00	60.50	79.77	81.67	80.72	3.63	3.50	3.57
7	**L7**	31.33	33.33	33.00	62.67	69.00	65.50	80.76	84.68	82.72	3.60	3.51	3.56
8	**L8**	26.67	30.33	27.00	61.33	59.67	59.00	85.32	84.87	85.10	4.40	4.56	4.48
9	**L9**	29.67	31.67	30.00	63.33	65.00	65.00	81.24	82.67	81.96	3.60	3.84	3.72
10	**L10**	29.00	31.00	28.00	64.00	66.00	65.50	75.37	78.55	76.96	3.40	3.40	3.40
11	**L11**	34.00	36.00	35.00	64.00	63.00	62.67	104.39	101.23	102.81	3.43	3.73	3.58
1	**T1**	33.33	33.67	34.17	69.00	63.33	65.83	82.16	92.11	87.14	6.17	4.57	5.37
2	**T2**	32.33	33.00	33.50	66.00	63.67	66.33	90.34	93.63	91.98	6.63	5.68	6.16
3	**T3**	31.00	32.00	31.50	64.33	64.33	63.83	97.38	81.48	89.43	3.73	5.53	4.63
	Mean	31.22	33.67	32.38	63.31	77.08	63.29	89.63	88.46	89.05	4.46	4.36	4.41
	C.V.	5.87	5.35	0.83	4.52	2.52	2.17	4.77	5.27	3.69	6.28	9.28	5.65
	S.Em	1.06	1.01	0.16	1.65	0.92	0.79	2.47	2.69	1.89	0.16	0.23	0.14
	C.D. 5%	3.41	2.82	0.44	5.74	2.59	2.23	6.93	7.56	5.32	0.45	0.66	0.40
	C.D. 1%	4.51	3.74	0.58	7.60	3.43	2.95	9.18	10.01	7.05	0.60	0.87	0.53
	Max	35.67	37.33	39.00	74.67	72.33	73.67	106.84	106.42	106.63	6.63	5.70	6.16
	Min	25.33	28.00	26.00	57.00	57.33	56.83	75.37	78.52	76.96	2.91	3.38	3.22

Conti…

Sr. No.	**Genotypes**	**Number of fruits per cluster**			**Number of fruits per plant**			**Average fruit weight (g)**			**Pericarp thickness (mm)**		
	Crosses	Y_1	Y_2	Pooled	Y_1	Y_2	Pooled	Y_1	Y_2	Pooled	Y_1	Y_2	Pooled
1.	L1×T1	4.48	4.02	4.25	28.39	25.53	26.96	94.48	97.43	95.96	0.36	0.39	0.37
2.	L1×T2	4.56	4.41	4.49	31.88	33.86	32.87	93.20	97.05	95.13	0.45	0.49	0.47
3.	L1×T3	4.46	4.02	4.23	25.56	23.31	24.43	87.31	87.58	87.45	0.37	0.35	0.36
4.	L2×T1	3.88	3.76	3.82	26.88	26.72	26.80	87.86	90.60	89.23	0.33	0.37	0.35
5.	L2×T2	4.14	4.02	4.08	31.94	34.13	33.04	92.22	93.30	92.76	0.45	0.55	0.50
6.	L2×T3	3.92	3.80	3.86	24.25	23.68	23.96	86.97	88.22	87.59	0.36	0.38	0.37
7.	L3×T1	3.88	3.75	3.82	26.95	25.40	26.18	77.07	82.20	79.64	0.54	0.41	0.48
8.	L3×T2	3.86	3.74	3.80	27.80	26.83	27.31	77.64	78.28	77.96	0.57	0.50	0.54
9.	L3×T3	3.64	3.53	3.59	23.21	23.55	23.38	77.38	79.13	78.26	0.54	0.52	0.53
10.	L4×T1	3.91	3.79	3.85	32.93	34.04	33.49	86.24	88.51	87.38	0.45	0.48	0.46
11.	L4×T2	4.08	3.96	4.02	29.26	28.55	28.90	85.54	90.72	88.13	0.54	0.51	0.53
12.	L4×T3	3.85	3.85	3.85	28.21	28.16	28.18	87.68	85.35	86.51	0.43	0.36	0.40
13.	L5×T1	4.12	4.00	4.06	26.28	24.79	25.54	67.19	70.00	68.59	0.46	0.45	0.45
14.	L5×T2	4.15	4.12	4.13	30.97	29.59	30.28	68.36	64.68	66.52	0.47	0.46	0.46
15.	L5×T3	3.23	3.28	3.26	24.18	24.60	24.39	68.50	69.18	68.84	0.46	0.45	0.45
16.	L6×T1	4.15	4.04	4.10	26.80	26.36	26.58	68.58	70.81	69.69	0.53	0.44	0.48
17.	L6×T2	4.23	4.20	4.21	31.94	31.42	31.68	69.29	71.92	70.61	0.60	0.58	0.59
18.	L6×T3	4.21	4.06	4.14	23.21	24.51	23.86	69.72	70.79	70.25	0.56	0.54	0.55
19.	L7×T1	4.85	4.80	4.83	27.41	26.66	27.04	67.88	67.72	67.80	0.57	0.47	0.52
20.	L7×T2	3.85	3.84	3.85	32.73	33.67	33.20	69.84	73.19	71.51	0.60	0.58	0.59
21.	L7×T3	4.65	4.41	4.53	25.22	25.81	25.52	69.84	70.31	70.07	0.55	0.53	0.54
22.	L8×T1	4.85	4.72	4.79	27.79	25.41	26.60	78.04	80.03	79.04	0.54	0.52	0.53
23.	L8×T2	4.85	4.41	4.63	29.03	27.42	28.23	77.10	81.37	79.24	0.58	0.59	0.58
24.	L8×T3	3.88	3.76	3.82	25.26	24.95	25.11	77.80	81.21	79.50	0.55	0.56	0.56
25.	L9×T1	3.86	3.74	3.80	28.21	27.31	27.76	89.11	91.59	90.35	0.44	0.48	0.46
26.	L9×T2	3.89	3.77	3.83	31.52	32.41	31.97	90.60	92.42	91.51	0.45	0.47	0.46
27.	L9×T3	3.17	3.07	3.12	22.24	23.76	23.00	88.35	90.78	89.57	0.45	0.49	0.47
28.	L10×T1	4.20	4.07	4.14	27.09	25.61	26.35	65.22	63.36	64.29	0.56	0.57	0.56
29.	L10×T2	4.19	4.06	4.13	32.91	31.42	32.16	67.99	70.33	69.16	0.59	0.57	0.58
30.	L10×T3	3.98	3.86	3.92	27.09	27.32	27.20	68.58	70.47	69.52	0.56	0.56	0.56
31.	L11×T1	3.85	3.73	3.79	37.76	37.54	37.65	74.64	75.97	75.30	0.47	0.45	0.46
32.	L11×T2	4.16	4.04	4.10	35.65	33.41	34.53	80.14	81.28	80.71	0.46	0.48	0.46
33.	L11×T3	3.88	3.76	3.82	33.34	33.89	33.62	68.79	68.79	68.79	0.45	0.47	0.46
1	L1	4.92	4.85	4.88	16.29	16.91	16.60	99.87	102.27	101.07	0.29	0.30	0.30
2	L2	3.94	3.86	3.90	16.15	15.56	15.85	98.24	99.98	99.11	0.27	0.31	0.29
3	L3	3.38	3.76	3.57	15.21	14.49	14.85	69.65	68.05	68.85	0.61	0.60	0.61
4	L4	3.59	3.67	3.63	18.20	16.44	17.32	93.57	94.02	93.80	0.48	0.47	0.48

5	L5	4.22	4.28	4.25	16.66	16.33	16.50	57.69	58.66	58.18	0.49	0.48	0.49
6	L6	4.49	4.30	4.40	15.83	17.39	16.61	53.58	55.34	54.46	0.69	0.67	0.68
7	L7	3.90	3.80	3.85	19.90	19.33	19.61	51.59	51.25	51.42	0.65	0.63	0.64
8	L8	4.53	4.42	4.48	18.39	17.61	18.00	68.05	66.90	67.47	0.63	0.62	0.62
9	L9	3.21	3.79	3.50	15.37	13.52	14.45	98.38	99.98	99.18	0.38	0.36	0.37
10	L10	4.07	4.15	4.11	22.17	21.46	21.81	47.19	48.71	47.95	0.68	0.67	0.67
11	L11	3.54	4.58	4.06	30.51	26.43	28.47	63.10	64.39	63.74	0.34	0.34	0.34
1	T1	4.01	4.27	4.14	36.51	35.42	35.97	81.59	81.97	81.78	0.41	0.43	0.42
2	T2	4.37	4.61	4.49	36.10	37.36	36.73	85.40	86.22	85.81	0.53	0.53	0.53
3	T3	3.39	3.60	3.50	31.45	32.27	31.86	75.26	76.00	75.63	0.42	0.43	0.43
	Mean	4.05	4.01	4.03	26.65	26.22	26.43	77.07	78.47	77.77	0.49	0.49	0.49
	C.V.	6.80	6.96	4.73	5.70	6.45	4.36	6.60	6.19	6.08	5.38	4.54	3.61
	S.E	0.16	0.16	0.11	0.88	0.98	0.67	2.94	2.81	2.73	0.02	0.01	0.01
	C.D. 5%	0.45	0.45	0.31	2.46	2.74	1.87	8.25	7.88	7.67	0.04	0.04	0.03
	C.D. 1%	0.59	0.60	0.41	3.26	3.63	2.48	10.92	10.43	10.16	0.06	0.05	0.04
	Max	4.92	4.85	4.88	37.76	37.54	37.65	99.87	102.27	101.07	0.69	0.67	0.68
	Min	3.17	3.07	3.12	15.21	13.52	14.45	47.19	48.71	47.95	0.27	0.30	0.29

Conti….

Sr. No.	**Genotypes**	**Number of locules per fruit**			**Polar diameter (cm)**			**Equitorial diameter (cm)**			**Total fruit yield per plant (kg)**		
	Crosses	**Y_1**	**Y_2**	**Pooled**	**Y_1**	**Y_2**	**Pooled**	**Y_1**	**Y_2**	**Pooled**	**Y_1**	**Y_2**	**Pooled**
1	L1×T1	3.11	3.32	3.21	5.24	5.08	5.16	4.71	4.51	4.61	2.56	1.00	2.53
2	L1×T2	3.31	3.23	3.27	5.67	5.51	5.59	4.58	4.44	4.51	2.72	1.38	2.81
3	L1×T3	3.45	3.39	3.42	5.42	5.18	5.30	5.26	5.06	5.16	2.20	1.21	2.16
4	L2×T1	3.58	3.48	3.53	6.45	6.01	6.23	5.37	5.21	5.29	2.37	1.33	2.44
5	L2×T2	3.68	3.58	3.63	6.32	6.13	6.23	5.53	5.34	5.44	2.71	1.43	2.64
6	L2×T3	3.78	3.68	3.73	6.30	6.11	6.21	4.69	4.55	4.62	2.12	1.25	2.14
7	L3×T1	3.04	3.34	3.19	5.39	5.04	5.22	4.70	4.56	4.63	2.08	0.97	2.12
8	L3×T2	3.10	3.13	3.11	5.41	5.25	5.33	4.56	4.42	4.49	2.15	0.98	2.17
9	L3×T3	3.78	3.66	3.72	4.97	4.82	4.90	4.21	4.08	4.14	1.80	0.94	1.87
10	L4×T1	3.39	3.31	3.35	6.58	5.89	6.24	4.49	4.36	4.42	3.16	2.56	2.86
11	L4×T2	3.29	3.23	3.26	6.49	6.30	6.39	4.56	4.42	4.49	2.51	1.01	2.59
12	L4×T3	3.78	3.67	3.72	6.68	6.48	6.58	4.67	4.53	4.60	2.48	1.07	2.48
13	L5×T1	3.68	3.57	3.62	6.22	6.03	6.13	4.36	4.48	4.42	1.68	0.99	1.74
14	L5×T2	3.97	3.85	3.91	6.11	5.93	6.02	4.56	4.42	4.49	2.12	0.97	2.05
15	L5×T3	2.81	2.89	2.85	5.88	5.70	5.79	4.57	4.43	4.50	1.66	1.09	1.71
16	L6×T1	2.71	2.90	2.81	5.18	5.02	5.10	3.78	3.67	3.72	1.84	1.11	1.89
17	L6×T2	3.27	3.17	3.22	5.34	5.18	5.26	3.51	3.40	3.46	2.22	1.17	2.27
18	L6×T3	3.18	3.08	3.13	5.35	5.19	5.27	4.66	4.50	4.58	1.62	1.24	1.71
19	L7×T1	3.01	2.92	2.96	5.62	5.45	5.53	4.52	4.38	4.45	1.87	0.93	1.87
20	L7×T2	3.17	3.14	3.16	5.61	5.44	5.53	4.68	4.63	4.66	2.28	0.99	2.41
21	L7×T3	3.14	3.05	3.09	5.58	5.41	5.50	4.65	4.51	4.58	1.76	0.96	1.82
22	L8×T1	3.13	3.04	3.08	5.53	6.30	5.91	5.28	5.12	5.20	2.17	1.08	2.14
23	L8×T2	3.19	3.09	3.14	5.36	5.20	5.28	5.45	5.29	5.37	2.24	0.97	2.27
24	L8×T3	3.68	3.57	3.62	5.48	5.32	5.40	4.58	4.44	4.51	1.91	1.12	2.00
25	L9×T1	3.39	3.29	3.34	5.67	5.50	5.58	4.43	4.30	4.36	2.52	0.99	2.54
26	L9×T2	3.47	3.37	3.42	5.44	5.37	5.40	4.56	4.42	4.49	2.84	1.06	2.88
27	L9×T3	3.68	3.57	3.62	5.75	5.58	5.66	4.32	4.19	4.26	1.96	1.03	2.10
28	L10×T1	3.17	3.14	3.16	5.37	5.21	5.29	3.61	3.50	3.56	1.76	1.44	1.72
29	L10×T2	3.68	3.57	3.62	5.58	5.41	5.50	3.59	3.48	3.54	2.24	1.67	2.26
30	L10×T3	3.78	3.67	3.72	4.69	5.52	5.10	4.27	4.14	4.20	1.86	1.35	1.93
31	L11×T1	3.81	2.93	3.37	5.93	5.78	5.86	4.39	4.37	4.38	2.82	1.12	2.87
32	L11×T2	3.81	2.92	3.36	5.44	5.57	5.50	4.40	4.60	4.50	2.76	1.13	2.74
33	L11×T3	3.16	3.10	3.13	4.65	5.48	5.06	4.47	4.34	4.40	2.26	1.23	2.32
1	L1	3.07	3.69	3.38	6.57	5.97	6.27	5.33	5.30	5.32	1.78	1.52	1.65
2	L2	4.57	4.62	4.59	6.55	6.36	6.45	5.53	5.36	5.45	1.59	0.98	1.62
3	L3	3.87	3.85	3.85	5.56	5.40	5.48	4.64	4.73	4.69	1.06	0.90	1.05
4	L4	3.67	3.56	3.61	6.63	6.43	6.53	5.50	5.34	5.42	1.70	0.97	1.67
5	L5	4.53	4.49	4.51	5.34	6.65	6.00	4.61	4.47	4.54	0.96	0.91	0.99
6	L6	2.83	3.02	2.92	6.05	5.87	5.96	4.21	4.08	4.15	0.85	1.12	0.91
7	L7	3.73	3.82	3.78	6.56	6.37	6.46	4.64	4.50	4.57	1.02	0.93	1.03
8	L8	3.07	3.36	3.22	5.68	5.39	5.54	5.35	5.19	5.27	1.25	1.13	1.24
9	L9	4.13	4.30	4.22	6.31	6.44	6.37	4.79	4.65	4.72	1.51	0.93	1.48
10	L10	4.13	4.40	4.26	6.61	6.03	6.32	3.68	3.57	3.62	1.05	1.60	1.07
11	L11	2.47	2.48	2.47	5.39	5.23	5.30	4.43	4.29	4.36	1.93	1.29	1.84
1	T1	4.00	4.22	4.11	5.44	5.68	5.57	4.46	4.64	4.55	2.98	1.30	2.97
2	T2	3.77	3.84	3.81	5.60	5.91	5.76	4.63	4.64	4.64	3.08	1.22	3.15
3	T3	3.30	3.06	3.18	5.39	5.31	5.35	4.24	4.29	4.27	1.96	1.73	1.84
	Mean	3.47	3.44	3.46	5.75	5.67	5.71	4.60	4.49	4.54	2.03	1.12	2.06
	C.V.	5.12	2.92	3.36	5.91	6.00	4.26	5.71	6.44	4.42	9.82	7.70	8.28
	S.E	0.10	0.06	0.07	0.20	0.20	0.14	0.15	0.17	0.12	0.12	0.05	0.10
	C.D. 5%	0.29	0.16	0.19	0.55	0.55	0.39	0.43	0.47	0.33	0.32	0.14	0.28

	C.D. 1%	0.38	0.22	0.25	0.73	0.73	0.52	0.56	0.62	0.43	0.43	0.19	0.37
	Max	4.57	4.62	4.59	6.68	6.65	6.58	5.53	5.36	5.45	3.08	1.67	3.15
	Min	2.47	2.48	2.47	4.65	4.82	4.90	3.51	3.40	3.46	0.85	0.90	0.91

Conti…

Sr. No.	**Genotypes**	**Marketable fruit yield per plant**			**Total soluble solid (TSS)**			**Titrable acidity (%)**			**Ascorbic acid content (mg/100g)**		
	Crosses	**Y_1**	**Y_2**	**Pooled**	**Y_1**	**Y_2**	**Pooled**	**Y_1**	**Y_2**	**Pooled**	**Y_1**	**Y_2**	**Pooled**
1	L1×T1	1.06	2.49	1.03	5.32	5.22	5.27	0.37	0.38	0.38	16.02	17.22	16.62
2	L1×T2	1.16	2.90	1.27	5.50	5.50	5.50	0.36	0.40	0.38	17.35	18.34	17.85
3	L1×T3	1.26	2.12	1.23	5.17	5.07	5.12	0.46	0.48	0.47	18.32	17.36	17.84
4	L2×T1	1.34	2.50	1.33	5.22	5.11	5.17	0.34	0.37	0.36	16.98	17.42	17.20
5	L2×T2	1.42	2.56	1.43	5.24	5.62	5.43	0.36	0.39	0.38	17.46	18.01	17.73
6	L2×T3	1.52	2.17	1.39	5.56	5.45	5.50	0.37	0.40	0.38	18.43	17.44	17.93
7	L3×T1	0.87	2.16	0.92	2.25	2.20	2.23	0.42	0.43	0.43	16.36	17.63	17.00
8	L3×T2	0.88	2.18	0.93	5.51	5.40	5.46	0.44	0.44	0.44	16.49	17.94	17.22
9	L3×T3	0.92	1.94	0.93	5.63	5.52	5.58	0.45	0.45	0.45	18.43	19.55	18.99
10	L4×T1	1.16	2.97	1.14	5.60	5.49	5.54	0.36	0.36	0.36	17.39	18.47	17.93
11	L4×T2	1.02	2.67	1.02	5.34	5.23	5.29	0.36	0.37	0.37	17.39	18.89	18.14
12	L4×T3	1.03	2.48	1.05	5.42	5.31	5.37	0.36	0.38	0.37	18.43	19.44	18.94
13	L5×T1	0.97	1.80	0.98	5.22	5.11	5.17	0.37	0.40	0.39	19.28	18.82	19.05
14	L5×T2	0.98	1.98	0.97	5.41	5.30	5.35	0.42	0.41	0.42	20.37	17.61	18.99
15	L5×T3	1.06	1.77	1.08	5.23	5.12	5.18	0.44	0.44	0.44	21.34	21.44	21.39
16	L6×T1	1.16	1.94	1.14	5.50	5.39	5.45	0.43	0.43	0.43	18.43	19.43	18.93
17	L6×T2	1.13	2.32	1.15	5.03	4.93	4.98	0.42	0.42	0.42	19.44	19.88	19.66
18	L6×T3	1.23	1.80	1.24	5.04	4.94	4.99	0.46	0.46	0.46	19.36	18.48	18.92
19	L7×T1	0.95	1.88	0.94	5.62	5.51	5.56	0.54	0.55	0.54	18.43	17.42	17.92
20	L7×T2	0.96	2.53	0.98	5.54	5.43	5.48	0.57	0.57	0.57	19.47	20.68	20.07
21	L7×T3	0.97	1.88	0.96	5.42	5.31	5.37	0.53	0.55	0.54	19.42	19.49	19.45
22	L8×T1	1.06	2.10	1.07	5.34	5.23	5.29	0.36	0.38	0.37	18.43	19.77	19.10
23	L8×T2	1.16	2.31	1.07	5.45	5.34	5.40	0.44	0.45	0.45	19.43	20.34	19.88
24	L8×T3	1.24	2.10	1.18	5.11	5.01	5.06	0.41	0.42	0.42	21.34	22.34	21.84
25	L9×T1	0.97	2.56	0.98	5.12	5.02	5.07	0.42	0.43	0.42	19.41	20.14	19.77
26	L9×T2	0.98	2.93	1.02	5.21	5.44	5.33	0.46	0.46	0.46	18.43	19.24	18.84
27	L9×T3	1.06	2.24	1.05	5.48	5.37	5.42	0.44	0.44	0.44	21.34	22.43	21.89
28	L10×T1	1.67	1.68	1.55	5.18	5.08	5.13	0.34	0.37	0.35	18.43	17.78	18.10
29	L10×T2	1.64	2.28	1.66	4.94	4.84	4.89	0.37	0.38	0.38	19.45	18.54	18.99
30	L10×T3	1.25	1.99	1.30	5.02	4.92	4.97	0.38	0.39	0.39	19.47	20.74	20.11
31	L11×T1	1.10	2.92	1.11	5.40	5.29	5.35	0.55	0.55	0.55	16.49	18.94	17.72
32	L11×T2	1.15	2.73	1.14	5.23	5.47	5.35	0.56	0.56	0.56	17.46	18.64	18.05
33	L11×T3	1.26	2.39	1.25	5.29	5.18	5.24	0.56	0.57	0.56	18.43	19.41	18.92
1	L1	0.95	1.73	0.96	6.37	6.24	6.31	0.41	0.40	0.41	18.31	18.77	18.54
2	L2	0.98	1.65	0.98	6.74	6.60	6.67	0.35	0.35	0.35	18.61	18.68	18.65
3	L3	0.78	1.05	0.84	6.77	6.63	6.70	0.51	0.50	0.50	18.75	17.74	18.24
4	L4	0.97	1.63	0.98	6.01	5.89	5.95	0.38	0.38	0.38	19.52	18.52	19.02
5	L5	0.95	1.01	0.93	6.42	6.29	6.35	0.43	0.43	0.43	22.25	22.41	22.33
6	L6	1.05	0.96	1.09	5.96	5.84	5.90	0.54	0.54	0.54	20.27	20.45	20.36
7	L7	0.90	1.04	0.92	6.15	6.02	6.09	0.54	0.55	0.55	20.48	21.46	20.97
8	L8	1.15	1.24	1.14	5.63	5.52	5.57	0.52	0.52	0.52	22.50	21.22	21.86
9	L9	0.95	1.44	0.94	6.29	6.17	6.23	0.47	0.46	0.46	22.33	22.68	22.50
10	L10	1.61	1.09	1.61	5.96	5.85	5.90	0.38	0.40	0.39	19.78	20.33	20.06
11	L11	1.24	1.76	1.26	5.27	5.17	5.22	0.68	0.48	0.58	17.58	18.56	18.07
1	T1	1.17	2.96	1.23	5.76	5.64	5.70	0.36	0.38	0.37	19.40	19.10	19.25
2	T2	1.65	3.22	1.43	5.60	5.49	5.55	0.38	0.40	0.39	17.44	19.46	18.45
3	T3	1.04	1.94	1.04	5.20	5.33	5.27	0.35	0.38	0.36	16.56	17.91	17.23
	Mean	1.13	2.08	1.12	5.46	5.38	5.42	0.43	0.44	0.44	18.86	19.29	19.07
	C.V.	7.84	9.66	5.26	4.52	4.65	3.02	4.86	4.42	3.21	2.51	4.35	2.23
	S.E	0.05	0.12	0.03	0.14	0.14	0.09	0.01	0.01	0.01	0.27	0.48	0.25
	C.D. 5%	0.14	0.33	0.10	0.40	0.41	0.27	0.03	0.03	0.02	0.77	1.36	0.69
	C.D. 1%	0.19	0.43	0.13	0.53	0.54	0.35	0.05	0.04	0.03	1.02	1.80	0.91
	Max	1.67	3.22	1.66	6.77	6.63	6.70	0.68	0.57	0.58	**22.503**	22.68	22.50
	Min	0.78	0.96	0.84	2.25	2.20	2.23	0.34	0.35	0.35	16.02	17.22	16.62

Conti….

Sr. No.	**Genotypes**	**Total sugar (mg/100g fresh fruit)**			**Lycopene**		
	Crosses	**Y_1**	**Y_2**	**Pooled**	**Y_1**	**Y_2**	**Pooled**
1	L1×T1	3.59	3.61	3.60	2.64	2.56	2.60
2	L1×T2	3.59	3.58	3.59	3.14	3.41	3.27
3	L1×T3	3.66	3.68	3.67	2.66	2.98	2.82
4	L2×T1	3.63	3.69	3.66	2.79	2.97	2.88
5	L2×T2	3.73	3.78	3.75	3.17	3.71	3.44
6	L2×T3	3.52	3.54	3.53	2.84	2.48	2.66
7	L3×T1	3.46	3.48	3.47	2.77	2.87	2.82
8	L3×T2	3.56	3.59	3.57	3.23	3.32	3.27
9	L3×T3	3.44	3.48	3.46	2.70	2.83	2.76
10	L4×T1	3.67	3.69	3.68	2.61	3.45	3.03

11	L4×T2	3.78	3.88	3.83	3.38	3.83	3.61
12	L4×T3	3.71	3.77	3.74	2.43	2.34	2.39
13	L5×T1	3.74	3.78	3.76	3.17	3.71	3.44
14	L5×T2	3.81	3.84	3.83	3.26	3.62	3.44
15	L5×T3	3.79	3.82	3.81	3.17	3.71	3.44
16	L6×T1	3.56	3.59	3.58	2.75	2.57	2.66
17	L6×T2	3.70	3.77	3.74	3.23	3.32	3.27
18	L6×T3	3.47	3.49	3.48	2.69	2.96	2.83
19	L7×T1	3.70	3.56	3.63	2.48	2.84	2.66
20	L7×T2	3.71	3.17	3.44	3.20	3.02	3.11
21	L7×T3	3.51	3.55	3.53	2.64	2.46	2.55
22	L8×T1	3.65	3.59	3.62	2.58	2.85	2.72
23	L8×T2	3.61	3.66	3.63	2.90	2.92	2.91
24	L8×T3	3.54	3.45	3.50	2.63	2.61	2.62
25	L9×T1	3.64	3.46	3.55	2.75	2.48	2.62
26	L9×T2	3.61	3.16	3.38	3.43	3.34	3.39
27	L9×T3	3.51	3.15	3.33	2.69	2.89	2.79
28	L10×T1	3.64	3.47	3.56	2.57	2.74	2.65
29	L10×T2	3.74	3.48	3.61	3.27	3.66	3.47
30	L10×T3	3.53	3.35	3.44	2.74	2.47	2.61
31	L11×T1	3.59	3.95	3.77	3.16	3.36	3.26
32	L11×T2	3.56	3.65	3.61	3.34	3.43	3.38
33	L11×T3	3.55	3.57	3.56	2.55	2.65	2.60
1	L1	3.47	3.74	3.60	2.56	2.65	2.61
2	L2	3.54	3.54	3.54	2.66	2.68	2.67
3	L3	3.32	3.23	3.28	2.74	2.47	2.61
4	L4	3.65	3.56	3.60	2.56	2.78	2.67
5	L5	3.77	3.87	3.82	3.33	3.34	3.33
6	L6	3.47	3.74	3.60	2.37	2.99	2.68
7	L7	3.54	3.45	3.50	2.41	2.78	2.60
8	L8	3.59	3.95	3.77	2.45	2.54	2.50
9	L9	3.54	3.46	3.50	2.74	2.67	2.71
10	L10	3.60	3.62	3.61	2.61	2.63	2.62
11	L11	3.51	3.15	3.33	2.58	2.78	2.68
1	T1	3.71	3.78	3.75	3.12	3.44	3.28
2	T2	3.89	3.98	3.94	3.98	3.45	3.71
3	T3	3.49	3.43	3.46	3.09	3.17	3.13
	Mean	3.61	3.59	3.60	2.87	2.99	2.93
	C.V.	1.79	4.40	2.54	5.75	5.93	4.65
	S.E	0.04	0.09	0.05	0.10	0.10	0.08
	C.D. 5%	0.10	0.26	0.15	0.27	0.29	0.22
	C.D. 1%	0.14	0.34	0.20	0.35	0.38	0.29
	Max	3.89	3.98	3.94	3.9767	3.83	3.71
	Min	3.32	3.15	3.28	2.37	2.34	2.39

CONCLUSION

Based on the results of the current study, it can be deduced that the top five hybrids for fruit yield per plant were $L_4 \times T_1$, $L_9 \times T_2$, L11×T1), $L_1 \times T_1$, $L_{11} \times XT_2$., with mean values of (2.90, 2.88, 2.87, 2.81, and 2.74, respectively). In order to develop favourable traits, these should be used in future breeding programme.

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Conflicts of Interest. None.

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