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Mean performance of 40 genotypes in tomato (*Solanum lycopersicum* L.)

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Abstract

The experiment was done to evaluate the performance of forty genotypes of tomato in the experimental farm of college of horticulture, Department of vegetable science, Sri Konda Laxman Telangana State Horticultural University, Rajendranagar, Hyderabad, Telangana, during *Kharif*, 2017-18. Among the genotypes used for evaluation the genotype LA-3667 was the superior for yield and yield contributing characters *i.e.* fruit yield per plant (2.28 kg) and yield per hectare (85.96 tonnes). The genotype EC-313466 was found to be early as observed from the character days to first flowering (21.26 days) and days to 50% flowering (29 days). The genotype EC-631349 was significantly superior for plant height (191.56 cm), number of primary branches (9.83), number of fruits per plant (323.00) and ascorbic acid (59.43mg/100g). The accession EC-514013 was found to be superior for TSS (8.16 °Brix). Highest beta carotene content was found in Money maker (2.63mg/100g). The check variety Arka Meghali was found to be superior for lycopene content (6.12mg/100g) followed by Marutham (5.51mg/100g) and AVTO-1314 (4.97mg/100g).

Keywords: Tomato, genotypes, performance, evaluation, quality, yield

Introduction

Tomato (*Solanum lycopersicum* L.) belonging to the family Solanaceae and is native of Andean region that includes parts of Colombia, Ecuador, Peru, Bolivia and Chile (Rick 1973, Taylor 1986) [7, 8]. It is one of the most popular and widely grown crops of commercial and dietary significance in the world as it is a very versatile vegetable. It was first domesticated in Mexico where various plants with a variety of fruit sizes and colors were selected (Jones, 2008; Kelley and Boyhan, 2010) [1, 3]. Due to its high consumption rate in developed and developing countries, it is often referred to as a luxury crop. In England, it is popularly known as love apple and is grown in all home gardens and by a large number of market and truck growers.

In India, tomato occupies an area of 0.8 million hectares with production of 22.34 million tonnes and productivity of 26 tonnes per hectare (NHB Database, 2017-18). In Telangana, tomato is cultivated in an area of 0.06 million hectares with a production of 1.1 million tonnes and a productivity of 21 tonnes per hectare (NHB Database, 2017-18). It is an excellent source of nutrients and secondary metabolites which are important for human health including minerals, vitamins C and E, β-carotene, lycopene, fla- vonoids, organic acids, phenolics and chlorophyll (Naika, 2005) [4]. Tomato has medicinal values and being used for blood purification and curing digestive ailments (Kaushik *et al.*, 2011) [2].

Material and Methods

The present study was carried out at the PG Research Block, Department of Vegetable Science, College of Horticulture, Rajendranagar, Sri Konda Laxman Telangana State Horticultural University, Hyderabad during *Kharif*, 2017-18. The experimental material comprised of forty germplasm lines, of tomato 34 genotypes and 6 released varieties (Arka Vikas, Pusa Ruby, PKM-1, Marutham, Arka Meghali and Arka Alok) (Table 1) which were obtained from NBPGR, Regional Station, Hyderabad; IARI, New Delhi and IHR, Bengaluru. All the genotypes were evaluated systematically during the research period.

The experiment was laid out with forty genotypes of tomato in Randomized Block Design (RBD) with three replications. Each germplasm line was grown in a plot of 1.8 m × 3.15 m (5.67 Sq. meters) accommodating 21 plants per plot, 7 plants per row with spacing of 60×45 cm² per replication.

The observations were recorded for 13 characters viz., Plant height (cm), Number of primary branches per plant, Days to first flowering, Days to 50% flowering, Days to fruit set, Number of fruits per plant, Average fruit weight (g), Fruit yield/plant (kg), Yield /ha(t), Ascorbic acid content (mg/100g), TSS (⁰Brix), Beta-carotene (mg/100g), Lycopene content (mg/100g) in five randomly selected plants from each genotype in each replication. The mean values of data were subjected to the analysis of variance for Randomized Block

Design as suggested by Panse and Sukhatme (1967) [6].

Results and Discussion

The analysis of variance for yield and its contributing characters under study are presented in Table 2. The mean sum of squares for genotypes was found to be significant for all the characters viz., plant height (cm), number of primary branches per plant, days to first flowering, days to 50% flowering, number of fruits per plant, average fruit weight (g), fruit yield per plant (kg), yield per hectare (t), ascorbic acid content (mg/100g), TSS (⁰Brix), beta-carotene (mg/100g) and lycopene content (mg/100g). The character-wise mean performance of different genotypes is presented in Table 3.

Table 1: List of genotypes used for evaluation along with their sources

S. No	EC No.	Source	S. No	EC No.	Source
1	EC-163681	NBPGR, Hyderabad	21	EC-274046	NBPGR, Hyderabad
2	EC-211582	NBPGR, Hyderabad	22	EC-251751	NBPGR, Hyderabad
3	EC-251518	NBPGR, Hyderabad	23	EC-615047	NBPGR, Hyderabad
4	EC-313466	NBPGR, Hyderabad	24	EC-620481	NBPGR, Hyderabad
5	EC-631349	NBPGR, Hyderabad	25	EC-620428	NBPGR, Hyderabad
6	EC-514013	NBPGR, Hyderabad	26	EC-617067	NBPGR, Hyderabad
7	EC-315481	NBPGR, Hyderabad	27	EC-620401	NBPGR, Hyderabad
8	EC-320565	NBPGR, Hyderabad	28	EC-620446	NBPGR, Hyderabad
9	EC-162601	NBPGR, Hyderabad	29	EC-654286	NBPGR, Hyderabad
10	EC-145057	NBPGR, Hyderabad	30	EC-315479	NBPGR, Hyderabad
11	EC-620480	NBPGR, Hyderabad	31	Arka Vikas©	IIHR, Bengaluru
12	EC-636482	NBPGR, Hyderabad	32	Pusa Ruby©	IARI, New Delhi
13	EC-315480	NBPGR, Hyderabad	33	Money Maker	UC, DAVIS, California, USA
14	EC-620439	NBPGR, Hyderabad	34	AVTO-1219	WVC, Taiwan, China
15	EC-620440	NBPGR, Hyderabad	35	AVTO-1314	WVC, Taiwan, China
16	EC-620441	NBPGR, Hyderabad	36	LA-3667	UC, DAVIS, California, USA
17	EC-620452	NBPGR, Hyderabad	37	PKM-1©	Periyakulam, TNAU
18	EC-620509	NBPGR, Hyderabad	38	Marutham©	IARI, New Delhi
19	EC-620472	NBPGR, Hyderabad	39	ArkaMeghali©	IIHR, Bengaluru
20	EC-620474	NBPGR, Hyderabad	40	Arka Alok©	IIHR, Bengaluru

EC: Exotic collection; ©-Check varieties

Table 2: RBD ANOVA for thirteen fruit yield and yield attributes in tomato

Character	Mean sum of squares		
	Replications (df=1)	Genotypes (df=39)	Error (df=78)
Plant height (cm)	27.064	2918.579**	32.713
Number of primary branches per plant	0.226	14.264**	0.112
Days to first flowering	11.518	50.991**	8.185
Days to 50% flowering	2.408	70.663**	5.092
Days to fruit set	13.080	102.978**	14.821
Number of fruits per plant	10.717	18090.380**	11.990
Average fruit weight (g)	1.963	4895.862**	20.196
Fruit yield per plant (Kg)	0.009	0.833**	0.006
Yield / hectare (t)	9.505	1143.861**	6.495
Ascorbic acid content (mg/100g)	0.905	305.285**	2.270
TSS(⁰ Brix)	0.034	3.988**	0.035
Beta-carotene (mg/100g)	0.009	0.573**	0.005
Lycopene content (mg/100g)	0.006	4.803**	0.025

* and ** significant at P = 0.05 and P = 0.01 level of significance respectively

Plant height (cm)

Plant height of genotypes ranged from 68.60 to 191.56 cm with a total mean of 109.56 cm. The EC-620481 recorded significantly dwarfest genotype (68.60 cm). Only one genotype EC-631349 (191.56 cm) recorded significantly tallest plant. Twenty two genotypes viz., EC-631349 (191.56 cm), EC-514013 (174.56 cm), EC-274046 (165.60 cm), EC-315479 (165.33 cm), EC-315481 (150.83 cm), EC-617067 (146.46 cm), EC-313466 (137.56 cm), EC-251751 (137.10

cm), Moneymaker (134.63 cm), EC-211582 (134.53 cm), EC-162601 (132.53 cm), EC-251518 (123.06 cm), EC-320565 (119.10 cm), EC-620509 (114.90 cm), EC-654286 (111.63 cm), EC-620428 (109.23 cm), AVTO-1219 (108.36 cm), EC-615047 (107.53 cm), EC-620401 (107.30 cm), EC-620439 (106.93 cm), EC-620441 (102.26 cm) and EC-145057 (101.83 cm) were significantly taller than the best check Arka Meghali (99.73 cm).

Number of primary branches per plant

Number of primary branches ranged from 2.43 to 9.83 with a grand mean of 5.89. Only one genotype EC-631349 (9.83) recorded significantly superior followed by EC-313466 (9.63) and EC-315481 (9.46). The genotype EC-620446 recorded the minimum number of primary branches per plant (2.43). Nine genotypes *viz.*, EC-631349 (9.83), EC-313466 (9.63), EC-315481 (9.46), EC-274046 (9.10), EC-514013 (8.73), EC-145057 (8.56), EC-211582 (8.36), EC-315479 (7.93) and EC-251518 (7.76) were recorded significantly higher number of primary branches per plant than the best check Arka Vikas (7.63).

Days to first flowering

Number of days taken to first flowering ranged from 21.26 to 43.86 days with a mean of 31.62 days. Among the genotypes EC-313466 (21.26) was significantly early to flower. The genotype EC-211582 was late to flower (43.86 days). Fifteen genotypes *viz.*, EC-313466 (21.26), EC-631349 (26.13), EC-620446 (27.86), EC-274046 (28.13), EC-315480 (28.26), EC-620441 (28.46), EC-251751 (28.80), EC-315479 (28.86), EC-514013 (29.13), EC-320565 (29.20), EC-615047 (29.53), EC-620481 (29.53), EC-620428 (29.56), EC-620472 (29.60) and EC-145057 (29.80) recorded significantly minimum number of days to first flowering compared to the best check Arka Vikas (29.90days).

Days to 50% flowering

Number of days taken to 50% flowering ranged from 29.00 to 52.00 days with a mean of 37.13 days. Among the genotypes, EC-313466 (29.00) took minimum number of days to 50 per cent flowering while EC-211582 was late to 50 percent flower (52.00 days). Out of forty, twenty five genotypes *viz.*, EC-313466 (29.00), EC-274046 (31.00), EC-315480 (31.66), EC-162601 (32.00), EC-620481 (32.00), EC-615047 (32.33), EC-315479 (32.33), EC-620441 (33.00), EC-620401 (33.33), EC-620472 (33.66), EC-620428 (34.00), EC-163681 (34.00), EC-617067 (34.33), EC-145057 (34.33), EC-620440 (34.66), EC-251751 (35.00), EC-251518 (35.00), EC-320565 (35.00), EC-620474 (35.33), EC-514013 (36.00), EC-620480 (36.33), EC-620446 (36.66), Money Maker (36.66), EC-636482 (37.33) and EC-620439 (37.66) recorded significantly minimum number of days to 50 per cent flowering compared to the best check Arka Meghali (37.66 days).

Days to fruit set

Number of days taken to fruit set ranged from 37.60 to 63.13 days with a mean of 45.40 days. Among the genotypes, EC-620440 (37.60) was significantly earliest to fruit set. Maximum number of days to fruit set was observed in EC-631349 (63.13 days). Twelve genotypes *viz.*, EC-620440 (37.60), EC-620428 (38.20), EC-251751 (38.60), EC-620401 (38.66), EC-620474 (39.50), EC-615047 (40.60), EC-145057 (40.60), EC-620474 (40.76), EC-320565 (40.93), EC-315479 (41.06), EC-163681 (41.66) and EC-620446 (42.00) recorded significantly minimum number of days to fruit set compared to the best check Pusa Ruby (42.20 days).

Number of fruits per plant

Number of fruits per plant ranged from 10.58 to 323. The genotype EC-631349 (323) recorded significantly superior number of fruits per plant. The genotype EC-620446 had least number of fruits (10.58) per plant followed by EC-

620428 (10.70). Fourteen genotypes *i.e.* EC-631349 (323), EC-313466 (271.89), EC-211582 (244.88), EC-514013 (237.72), EC-315481 (168.00), EC-315479 (69.39), EC-163681 (57.83), EC-251518 (49.24), EC-274046 (45.01), EC-162601 (35.37), EC-145057 (34.57), Money Maker (33.80), EC-251751 (32.26) and EC-320565 (32.00) recorded significantly higher number of fruits per plant compared to the best check Arka Alok (30.86).

Average fruit weight (g)

Fruit weight ranged from 0.96 g to 194.44 g. The genotype EC-620446 (194.44 g) recorded significantly superior fruit weight. Minimum fruit weight was observed in EC-313466 (0.96 g) followed by another four genotypes EC-514013 (1.46 g), EC-211582 (1.56 g), EC-631349 (1.57 g) and EC-315481 (1.86 g). Twenty genotypes *i.e.* EC-620446 (194.44 g), EC-620428 (138.36 g), EC-620509 (118.72 g), EC-620474 (95.37 g), EC-620480 (94.92 g), LA-3667 (93.17 g), EC-654286 (86.84 g), EC-620439 (81.63 g), EC-620481 (76.84 g), EC-615047 (74.97 g), EC-620401 (66.84 g), AVTO-1219 (68.81 g), AVTO-1314 (68.66 g), EC-620452 (68.40 g), EC-620441 (67.63 g), Money Maker (64.56 g), EC-620440 (61.34 g), EC-636482 (58.75 g), EC-617067 (55.85 g) and EC-620472 (46.84 g) recorded significantly higher fruit weight compared to the best check Arka Vikas (45.18 g).

Fruit yield per plant (kg)

Fruit yield per plant exhibited a wide range of variability the genotype LA-3667 (2.28 kg) recorded significantly superior yield with a grand mean of 1.17. The highly significant differences among genotypes were recorded for fruit yield per plant with coefficient of variability of 6.52 per cent. The genotype EC-313466 (0.26 kg) recorded minimum fruit weight followed by EC-315481 (0.31kg) which are at par. Out of forty, eleven genotypes *viz.*, LA-3667 (2.28kg), Money Maker (2.17kg), EC-620441 (2.06kg), EC-620446 (2.05kg), AVTO-1219 (2.02kg), AVTO-1314 (1.94kg), EC-620509 (1.87kg), EC-620452 (1.52kg), EC-620428 (1.48kg), EC-620481 (1.42kg) and EC-620474 (1.35kg) recorded significantly higher yield per plant compared to the best check PKM-1 (1.31kg).

Yield per hectare (t)

Fruit yield per hectare exhibited a wide range of variability. The genotype LA-3667 (85.96 t) recorded significantly superior yield per hectare. The genotype EC-313466 recorded minimum yield per hectare (9.66 t). Out of forty, eleven genotypes *viz.*, LA-3667 (85.96 t), Money Maker (80.73 t), EC620441 (76.68 t), EC-620446 (75.96 t), AVTO-1219 (74.83 t), AVTO-1314 (70.73 t), EC-620509 (69.27 t), EC-620452 (56.29 t), EC-620428 (54.82 t), EC-620481 (52.63 t), EC-620474 (50.06 t) recorded significantly higher yield per hectare compared to the best check PKM-1 (48.56 t).

Ascorbic acid (mg/100g)

Ascorbic acid content in tomato genotypes tested ranged from 11.76 mg to 59.43mg per 100g of pulp. The genotype EC-631349 (59.43 mg) recorded significantly superior ascorbic acid content compared to the best checks (Arka Vikas and Pusa ruby, PKM-1, Marutham, Arka Meghali and Arka Alok) followed by EC-211582 (48.46 mg). Lowest ascorbic acid was found in EC-620446 (11.76 mg) per 100g of pulp the grand mean ascorbic acid content was 31.25 mg per 100g.

Table 3: Mean performance of thirteen fruit yield and associated characters in forty genotypes of tomato

S. N	Genotype	Plant height(cm)	Number of primary branches per plant	Days to first flowering	Days to 50% flowering	Days to fruit set	Number of fruits per plant	Average fruit weight(g)	Fruit yield/plant (kg)	Yield /ha(t)	Ascorbic acid content (mg/100g)	TSS(^o Brix)	Beta-carotene (mg/100g)	Lycopene content (mg/100g)
1	EC-163681	87.63	6.90	29.93	34.00	41.66	57.83	19.30	1.10	41.15	40.73	4.26	1.13	3.25
2	EC-211582	134.53	8.36	43.86	52.00	60.26	244.88	1.56	0.38	14.49	48.46	5.86	1.23	0.00
3	EC-251518	123.06	7.76	30.13	35.00	43.00	49.24	10.96	0.54	20.02	42.86	4.26	1.25	2.61
4	EC-313466	137.56	9.63	21.26	29.00	52.20	271.89	0.96	0.26	9.66	41.73	6.46	1.26	2.53
5	EC-631349	191.56	9.83	26.13	42.66	63.13	323.00	1.57	0.51	18.90	59.43	5.40	1.15	0.00
6	EC-514013	174.36	8.73	29.13	36.00	53.46	237.72	1.46	0.35	12.98	46.73	8.16	2.31	4.45
7	EC-315481	150.83	9.46	38.13	45.00	58.66	168.00	1.86	0.31	11.55	46.66	7.73	1.31	0.00
8	EC-320565	119.10	7.46	29.20	35.00	40.93	32.00	35.52	1.13	42.22	24.66	4.36	1.43	4.28
9	EC-162601	132.53	7.20	30.33	32.00	42.53	35.37	20.22	0.71	26.31	36.43	4.13	1.31	3.66
10	EC-145057	101.83	8.56	29.80	34.33	40.60	34.57	32.84	1.13	41.86	40.33	3.33	1.95	2.75
11	EC-620480	95.26	3.66	32.00	36.33	44.73	13.40	94.92	1.27	47.09	35.13	4.00	1.65	4.33
12	EC-636482	74.46	2.60	31.26	37.33	43.66	15.56	58.75	0.90	33.73	18.26	3.43	1.45	3.91
13	EC-514013	93.70	6.50	28.26	31.66	44.06	25.83	34.61	0.88	32.94	26.06	3.50	2.15	3.51
14	EC-620439	106.93	3.20	31.86	37.66	45.40	14.13	81.63	1.14	42.60	32.46	4.43	2.06	3.72
15	EC-620440	84.70	3.16	31.73	34.66	37.60	16.30	61.34	0.98	36.66	26.20	3.76	1.10	3.54
16	EC-620441	102.26	3.43	28.46	33.00	43.20	30.57	67.63	2.06	76.68	20.73	4.13	1.96	2.77
17	EC-620452	89.43	2.46	32.13	38.00	46.26	22.30	68.40	1.52	56.29	27.36	3.20	2.08	2.35
18	EC-620509	114.90	4.33	30.60	38.33	46.26	15.80	118.72	1.87	69.27	26.40	3.06	1.77	2.83
19	EC-620472	89.00	4.03	29.60	33.66	39.50	23.00	46.84	1.07	41.06	26.00	3.33	1.86	3.26
20	EC-620474	97.36	3.83	32.26	35.33	40.76	14.13	95.37	1.35	50.06	28.60	4.00	2.13	2.47
21	EC-274046	165.60	9.10	28.13	31.00	44.26	45.01	25.19	1.13	41.87	33.66	4.06	1.84	2.93
22	EC-251751	137.10	7.30	28.80	35.00	38.60	32.26	40.11	1.28	47.92	22.46	3.06	1.08	3.45
23	EC-615047	107.53	4.50	29.53	32.33	40.60	12.10	74.97	0.89	33.44	19.86	2.96	2.45	2.71
24	EC-620481	68.60	6.30	29.53	32.00	42.86	18.53	76.84	1.42	52.63	19.60	3.16	1.67	2.37
25	EC-620428	109.23	5.30	29.56	34.00	38.20	10.70	138.36	1.48	54.82	23.40	3.63	1.83	3.87
26	EC-617067	146.46	3.36	30.26	34.33	46.73	20.73	55.85	1.15	42.60	32.26	3.50	1.45	3.53
27	EC-620401	107.30	5.06	30.53	33.33	38.66	14.21	66.84	0.95	35.18	30.80	4.16	1.26	3.27
28	EC-620446	82.90	2.43	27.86	36.66	42.00	10.58	194.44	2.05	75.96	11.76	3.43	2.07	2.96
29	EC-654286	111.63	3.76	34.13	45.00	48.33	14.08	86.84	1.23	45.56	36.40	5.06	1.36	3.61
30	EC-315479	165.33	7.93	28.86	32.33	41.06	69.39	8.21	0.57	21.14	33.60	4.96	1.06	3.97
31	Arka vikas ©	72.50	7.63	29.90	38.33	42.53	27.74	45.18	1.25	46.35	28.86	4.76	1.53	3.87
32	Pusa ruby©	79.26	7.03	31.72	40.66	42.20	27.66	38.98	1.07	39.69	25.20	4.60	1.85	4.63
33	Money maker	134.63	4.63	32.80	36.66	45.00	33.80	64.56	2.17	80.73	29.40	3.50	2.63	4.11
34	AVTO-1219	108.36	4.26	36.13	40.33	46.06	29.42	68.81	2.02	74.83	17.13	3.73	1.96	3.91
35	AVTO-1314	76.83	5.70	38.26	42.66	47.36	27.88	68.66	1.94	70.73	27.13	5.03	1.85	4.97
36	LA-3667	72.66	5.13	34.46	40.33	47.90	24.97	93.17	2.28	85.96	32.80	4.83	1.26	3.11
37	PKM-1©	70.26	6.80	36.86	43.33	47.83	29.54	44.51	1.31	48.56	26.66	4.20	1.64	3.07
38	Marutham©	82.70	5.03	40.73	45.00	52.73	29.68	37.22	1.08	40.78	35.10	3.96	1.95	5.51
39	Arka meghali©	99.73	6.33	34.33	37.66	46.40	23.52	30.74	0.72	26.69	47.53	4.23	2.60	6.12
40	Arka alok ©	83.03	6.86	36.60	43.33	48.80	30.86	40.95	1.26	46.70	21.06	5.00	2.17	4.23
	Grand mean	109.56	5.89	31.62	37.13	45.40	54.45	53.87	1.17	43.44	31.25	4.31	1.70	3.31
	S.Em±	3.30	0.19	1.65	1.30	2.22	1.99	2.59	0.04	1.47	0.86	0.10	0.04	0.09
	CV (%)	5.22	5.69	9.04	6.07	8.47	6.35	8.34	6.52	5.86	4.82	4.33	4.33	4.76
	CD(P=0.05)	9.29	0.54	4.65	3.66	6.25	5.62	7.30	0.12	4.14	2.44	0.30	0.12	0.25

Total soluble solids (^oBrix)

Among the 40 genotypes tested, the total soluble solids ranged from 2.96^oBrix to 8.16 ^oBrix. The genotype EC-514013 (8.16^oBrix) recorded significantly higher amount of total soluble solids. Minimum total soluble solids was observed in EC-615047 (2.96 ^oBrix) followed by EC-251751 (3.06 ^oBrix), EC - 620509 (3.06 ^oBrix) and EC - 620481 (3.16 ^oBrix). Six genotypes viz., EC - 514013 (8.16 ^oBrix), EC - 315481 (7.73 ^oBrix), EC - 313466 (6.46 ^oBrix), EC - 211582 (5.86 ^oBrix), EC - 631349 (5.40 ^oBrix), AVTO - 1314 (5.03 ^oBrix) recorded significantly higher amount of total soluble solids compared to the best check Arka Alok (5.00 ^oBrix).

Beta carotene (mg/100g)

Beta carotene content ranged from 1.06 mg to 2.63 mg per 100 g of pulp. Highest beta carotene content was found in Money maker (2.63 mg) followed by Arka Meghali (2.60 mg), which are at par. Lowest beta carotene content was found in the genotype EC-315479 (1.06 mg) followed by EC-251751(1.08 mg), EC-620440 (1.10 mg) and EC-163681

(1.13 mg) with a mean of 1.70 mg.

Lycopene content (mg/100g)

Lycopene content ranged from nil to 6.12 mg per 100 g of pulp. Highest lycopene content of (6.12 mg) was recorded in check variety Arka Meghali. The grand mean was 3.31 mg. Lowest lycopene content of 0.00 mg was found in three genotypes viz., EC- 211582, EC-631349 and EC-315481, which were having greenish yellow fruit. No genotype recorded significantly higher lycopene content compared to the best check (Arka Meghali).

Conclusion

Considering the mean performance, five superior genotypes for fruit yield viz., LA-3667 (2.28 kg/plant), Money Maker (2.17 kg/plant), EC-620441 (2.06 kg/ plant), EC-620446 (2.05 kg/plant), AVTO-1219 (2.02 kg/plant), may be released as pureline or inbreeding programmes after testing their stability over location and years for commercial cultivation. The genotypes with superior quality traits viz., EC-631349 for

ascorbic acid (59.43mg/100gm), EC-514013 for TSS (8.16 °Brix) and Money maker for betacarotene (2.63mg/100gm) can be included in pedigree selection for further improvement.

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