

RESEARCH ARTICLE :

Performance of tomato (*Solanum lycopersicum* L.) hybrids suitable during *Kharif* for northern Telangana Zone

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SUMMARY : Investigation on performance of different tomato F₁ hybrids under northern Telangana conditions was carried out among twelve different hybrids (*viz.*, BSS-3000, Priya-6636, US - 618, Himsona, Annapurna, Lakshmi, Abhinava, US -404, Hy-Lyco, Arka Abhijit, Arka Ananya and Arka Shreshta, during the *Kharif* seasons of 2010-11, 2011-12 and 2012-13. The Anova revealed that there existed significant differences among the hybrids for all the characters studied (except for days taken to flowering and duration of fruiting) when analysed for individual years and also when pooled over the years. It was found that the average significant maximum plant height was recorded in Priya followed by Himsona. The significant average number of branches plant⁻¹ were maximum in Arka Shreshta followed by Arka Ananya. There was no significant difference for days taken to flowering and duration of fruiting among the hybrids. The significant maximum average number of fruit plant⁻¹ was recorded in Abhinava and the significant highest mean yield was obtained from Abhinava.

KEY WORDS :

Tomato hybrids, BSS-3000, Priya-6636, US - 618, Himsona, Annapurna, Lakshmi, Abhinava, US -404, Hy-Lyco, Arka Abhijit, Arka Ananya, Arka Shreshta, Fruit yield

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BACKGROUND AND OBJECTIVES

Tomato (*Solanum lycopersicum* L.) is an economical vegetable crop grown all over the world. It belongs to the family solanaceae with 2n=24 chromosomes. It is a day neutral plant and can be grown in any season. It is considered as protective food as it possesses several nutritive value traits particularly antioxidant compounds which are being used in several commercial therapeutical formulations. Tomato is protective supplementary food and rich source of

vitamins A, C, potassium, minerals and fibres. It is used in preparation of preserved products like ketch-up, sauce, chutney, soup, paste, puree etc. In tomato yield is the most important agro-economical trait, therefore, it is included in almost all tomato selection programmes. In tomato, yield plant⁻¹ depends on fruit weight and number of fruits, flower bunch⁻¹. Though number of hybrids have been developed commercially but successful cultivation of tomato is based essentially upon choice of suitable varieties for a particular location,

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keeping this in mind, the present study was taken upto identify the best hybrid with higher yields suitable for northern Telangana zone in *Kharif* season.

RESOURCES AND METHODS

The experiment was carried out at Horticulture Research Station, Adilabad, during the *Kharif* seasons of 2010-11, 2011-12 and 2012-13. The material comprises of twelve hybrids of tomato viz., T₁-BSS-3000, T₂-Priya-6636, T₃-US-618, T₄- Himsona, T₅-Annapurna, T₆-Lakshmi, T₇- Abhinava, T₈- US -404, T₉-Hy-Lyco, T₁₀ Arka Abhijit, T₁₁- Arka Ananya and T₁₂-Arka Shreshta. The experiment was laid out in a Randomized Block Design with three replications. Four week old healthy seedlings of each genotype were transplanted during the first week of July every year and plants were spaced at 60 cm distance between rows and 45 cm distance between plants with in the row in a plot of 4 x 5 m². Cultural and agronomic practices were followed as per the standard recommendation and need based plant protection measures were taken upto maintain a healthy crop stand. Observations were recorded on plants excluding border plants in each replication of each genotype for twelve hybrids viz., Five plants were selected at random in each plot every year to record the observations on plant height (cm), number of branches plant⁻¹, days to flowering, fruits plant⁻¹, weight of fruits plant⁻¹, duration of fruiting (days) and yield (q ha⁻¹). The mean for each genotype were analysed statistically.

OBSERVATIONS AND ANALYSIS

The results pertaining to the analysis of variance for the experimental designs are reported in the above Tables 1 to 4 and Fig. 1 to 5. The Anova revealed that there existed significant difference among the hybrids for all characters studied (except for days taken to flowering and duration of fruiting) when analysed for individual years and also when pooled over the years. The average significant maximum plant height was recorded in T₂- priya-6636 (122.66 cm) followed by T₄- Himsona (118.43 cm), while the lowest in T₅-Annapurna (74.29 cm). The significant average number of branches plant⁻¹ were maximum in T₁₂- Arka Shreshta (42.17) followed by T₁₁- Arka Ananya (41.87), while the lowest in T₃-US-618 (19.20). There was no significant difference among the hybrids for days taken to flowering,

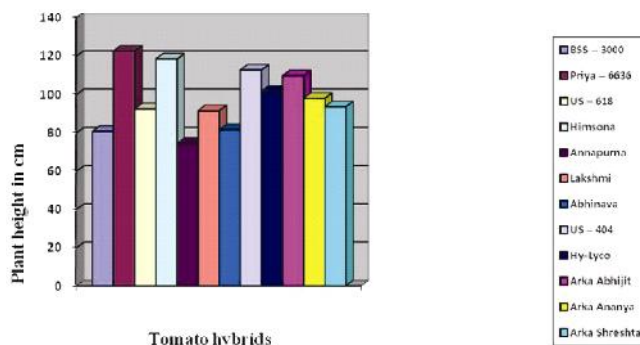


Fig. 1 : Bar graph for plant height of 12 tomato hybrids

Table 1 : Performance for height and number of brancher plant⁻¹ among tomato hybrids

Sr. No.	Cultivar	Plant height (cm)				No. of branches plant ⁻¹			
		2010-11	2011-12	2012-13	VG	2010-11	2011-12	2012-13	AVG
1.	BSS – 3000	79.03	82.11	80.82	80.65	19.04	23.17	22.83	21.68
2.	Priya – 6636	124.27	122.19	121.52	122.66	23.16	25.27	26.31	24.91
3.	US – 618	92.17	93.11	91.85	92.38	19.53	20.14	17.92	19.20
4.	Himsona	118.24	120.27	116.79	118.43	29.41	30.62	27.53	29.19
5.	Annapurna	73.63	74.13	75.1	74.29	20.6	22.13	21.42	21.38
6.	Lakshmi	93.23	90.14	90.85	91.41	37.69	40.17	38.06	38.64
7.	Abhinava	81.2	80.15	83.31	81.55	39.52	37.13	35.93	37.53
8.	US – 404	115.57	110.52	111.98	112.69	38.27	35.14	34.43	35.95
9.	Hy-Lyco	102.2	99.26	103.44	101.63	36.33	33.16	35.7	35.06
10.	Arka Abhijit	113.53	100.41	115.02	109.65	34.14	35.17	34.67	34.66
11.	Arka Ananya	96.56	99.32	97.91	97.93	42.53	41.65	41.42	41.87
12.	Arka Shreshta	93.18	95.13	92.03	93.45	37.35	40.13	49.03	42.17
	S.E.±	4.47	4.76	4.51		0.62	0.54	1.56	
	C.D. (P=0.05)	7.26	7.49	5.31		2.69	2.78	4.28	

Table 2 : Performance for number of days taken to flowering (Days) and duration of the fruiting (days) among tomato hybrids

Sr. No.	Cultivar	Days taken to flowering (days)				Duration of the fruiting(days)			
		2010-11	2011-12	2012-13	avg	2010-11	2011-12	2012-13	avg
1.	BSS – 3000	40.12	41.29	40.1	40.50	16	15	15	15.33
2.	Priya – 6636	41.35	41.31	40.27	40.98	15	15	16	15.33
3.	US – 618	42.06	42.18	41.03	41.76	14	16	15	15.00
4.	Himsona	42.14	42.13	41.93	42.07	15	14	16	15.00
5.	Annapurna	42.32	42.21	42.2	42.24	17	16	14	15.67
6.	Lakshmi	40.26	41.17	41.63	41.02	16	17	15	16.00
7.	Abhinava	40.18	40.05	40.13	40.12	15	16	15	15.33
8.	US – 404	40.25	40.34	40.2	40.26	14	15	15	14.67
9.	Hy-Lyco	40.34	40.27	34.47	38.36	15	14	16	15.00
10.	Arka Abhijit	40.09	41.15	40.93	40.72	16	15	15	15.33
11.	Arka Ananya	41.43	42.17	40.57	41.39	16	14	15	15.00
12.	Arka Shreshta	41.21	41.28	39.83	40.77	17	16	14	15.67
	S.E.±	-	-	-	-	-	-	-	-
	C.D. (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS

NS=Non-significant

Table 3 : Performance for number of fruits plant⁻¹ and weight of the fruit plant⁻¹ among tomato hybrids

Sr. No.	Cultivar	No. of fruits plant ⁻¹				Weight of the fruit plant ⁻¹			
		2010-11	2011-12	2012-13	AVG	2010-11	2011-12	2012-13	AVG
1.	BSS – 3000	8.63	10.54	9.26	9.5	757.71	640.11	678.84	692.22
2.	Priya – 6636	10.21	12.43	11.87	11.5	738.31	515.45	621.97	625.24
3.	US – 618	9.47	10.68	12.01	10.7	842.46	798.23	743.61	794.77
4.	Heemsona	11.24	10.53	11.47	11.1	926.73	842.14	873.21	880.69
5.	Annapurna	12.87	11.45	13.28	12.5	896.21	996.35	838.84	910.47
6.	Lakshmi	16.73	15.11	14.87	15.6	1024.78	925.12	957.21	969.04
7.	Abhinava	24.53	29.34	26.24	26.7	1790.7	1350.13	1350.71	1497.18
8.	US – 404	27.13	25.27	24.86	25.8	1604.24	1550.26	1204.64	1453.05
9.	Hy-Lyco	19.43	21.54	20.37	20.4	1572.11	1208.12	1307.85	1362.69
10.	Arka Abhijit	20.16	22.38	23.43	22.0	1478.28	1216.23	1317.05	1337.19
11.	Arka Ananya	27.12	20.12	25.76	24.3	1554.26	1372.46	1411.71	1446.14
12.	Arka Shreshta	18.27	19.43	19.14	18.9	1322.13	1151.52	1242.69	1238.78
	S.E.±	0.27	0.45	0.41		2565.45	955.95	921.90	
	C.D. (P=0.05)	1.79	2.32	2.21		173.93	106.17	104.27	

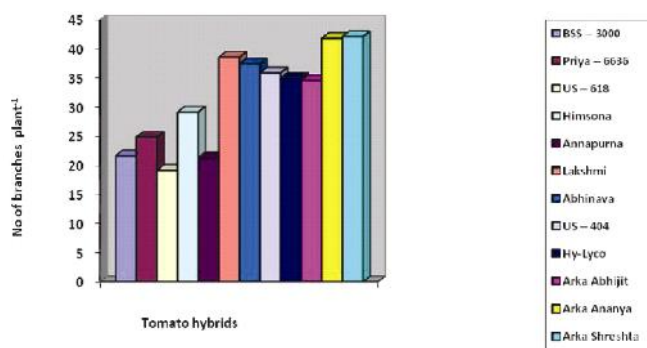


Fig. 2 : Bar graph for no. of branches plant⁻¹ among 12 tomato hybrids

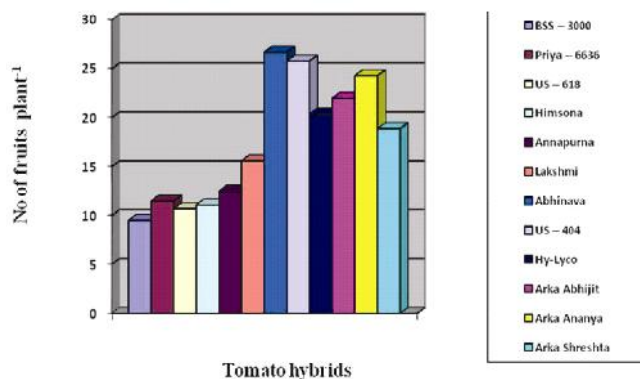
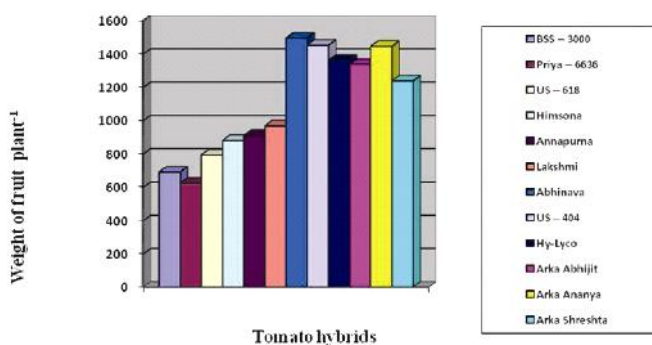


Fig. 3 : Bar graph for no. of fruits plant⁻¹ among tomato hybrids

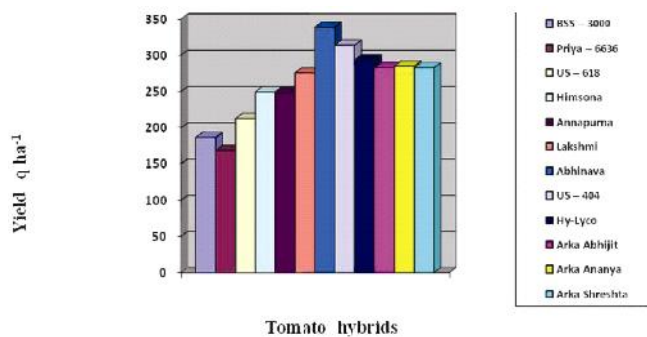
Table 4 : Performance for yield in q ha⁻¹ among tomato hybrids

Sr. No.	Cultivar	Yield in q ha ⁻¹			
		2010-11	2011-12	2012-13	AVG
1.	BSS – 3000	204.58	172.82	183.02	186.81
2.	Priya – 6636	199.31	139.27	167.64	168.74
3.	US – 618	227.22	210.56	200.37	212.72
4.	Himsona	262.75	250.32	235.51	249.53
5.	Annapurna	241.16	280.13	226.46	249.25
6.	Lakshmi	276.69	292.16	258.82	275.89
7.	Abhinava	321.83	330.14	364.78	338.92
8.	US – 404	306.32	310.16	325.56	314.01
9.	Hy-Lyco	298.16	292.52	290.72	293.80
10.	Arka Abhijit	293.52	269.16	287.16	283.28
11.	Arka Ananya	296.54	273.14	285.74	285.14
12.	Arka Shreshta	285.47	294.17	268.97	282.87
	S.E.±	31.75	59.68	58.22	
	C.D. (P=0.05)	19.34	26.53	26.20	

**Fig. 4 : Bar graph for weight of fruit plant⁻¹ among tomato hybrids**

however early flowering was observed in T₉-Hy-Lyco (38.36 days) followed by T₇- Abhinava (40.12 days), while late flowering was observed T₅-Annapurna (42.24 days) and also their no significant difference for duration of fruiting, however the average maximum duration of fruiting was observed in T₆- Lakshmi (16 days) followed by T₇- Abhinava and T₇- Arka Shreshta with (15.67days). The significant maximum average number of fruits plant⁻¹ was recorded in T₇- Abhinava (26.7), followed by T₈-US-404 (25.8), while the minimum in T₁-Bss-3000 (9.5). Significantly highest average weight of fruits plant⁻¹ was recorded in T₇- Abhinava (1497.18 g) followed by T₈-US-404 (1453.05g), while the minimum in T₂- Priya (625.24 g).

The data recorded for three years on yield revealed that significantly the highest mean yield was obtained from T₇- Abhinava (338.92 q ha⁻¹) followed by T₈- US –

**Fig. 5 : Bar graph for yield (q ha⁻¹) among tomato hybrids**

404 (314.01 q ha⁻¹). On the contrary, the lowest yield was recorded from T₂- Priya (168.74 q ha⁻¹).

From the results, it can be concluded that Abhinava and US-404 can be effectively grown in northern Telangana Zone for obtaining higher yields in tomato crop.

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