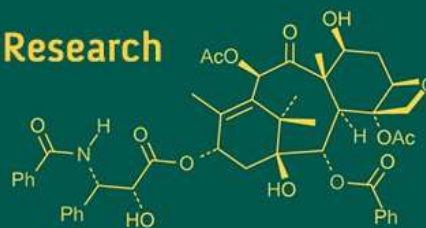
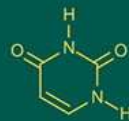
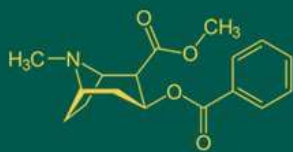


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Performance of different tomato hybrids in Prayagraj agro-climatic condition

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Abstract

The present investigation carried out with title “Performance of Different Tomato Hybrids In Prayagraj Agro Climatic Condition” at the Horticulture Research Farm, Department of Horticulture, Naini Agricultural Institute, Faculty of Agriculture, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj, Uttar Pradesh during Jan-April 2023 to find out the best treatment for better growth and yield of Tomato. The experiment was laid out in Randomized Block Design comprising of 10 treatments viz., T₁ Horsely, T₂ Ayushman, T₃ Ansal T₄ Ashutosh, T₅ Saksham, T₆ TMTH 2230, T₇ Narendra-2, T₈ No-575, T₉ Balwa (LS-1215), T₁₀ Chitra (LS-751) with three replications. The parameters relating to growth, yielding attributes and yield parameters were measure to make a critical analysis of the crop as affected by different treatments. The technique of representative sample was adopted for recording the observations various morphological characters in tomato. At every observation, three plants from each plot were randomly selected and tagged. The treatments in each replication were allotted randomly. The results revealed that the treatment T₃ (Ansal) was found to be the most suitable over all the other treatments in relation to growth and yield of Tomato.

Keywords: Tomato, varieties, protected structure, growth, yield

Introduction

Tomato (*Lycopersicon esculentum*), belong to the Solanaceae family, is one of the most commonly cultivated vegetable crops worldwide. In India it is cultivated in 83,000 ha area with a production of 7, 90, 000 tonnes in both hills and plains. In J&K, it is cultivated in 3.29 th ha with a production of 79.95 th tonnes and a productivity of 24.34 tonnes/ha (Anonymous, 2022) [3].

Tomato being most important to growers, consumers and to the processing industry, there is urgent need to evolve suitable varieties/ hybrids to increase its productivity to fulfill increasing demand and gaps of productivity between Indian and World average with having standardized management and production practices. Lycopene is carotenoid it is the main pigment of tomatoes, conferring to the fruit its red colour. Antioxidants in foods have recently emerged as the biomolecules of almost interest to human health. Tomato is one of the most popular vegetable grown through out the world ranking second in importance next to potato in many countries including India. In India, tomato has wider coverage in comparison to the vegetables.

Tomato is a rich source of minerals, vitamins and organic acid, essential amino acids and dietary fibers. Tomato is known as productive as well as protective food. It is a rich source of vitamin A and C, it also contains minerals like iron, phosphorus. Tomato contains Lycopene and Beta-carotene pigment.

Tomatoes have a rich flavor, high liquid content, very soft flesh which breaks down easily, and the right composition to thicken into a sauce when they are cooked (without the need of thickeners like roux). All of these qualities make them ideal for simple and appealing sauces. The simplest tomato sauces consist just of chopped tomato flesh (with the skins and seeds optionally removed), cooked in a little olive oil and simmered until it loses its raw flavor, and seasoned with salt.

The present investigation carried out with title “Performance of Different Tomato Hybrids in Prayagraj Agro Climatic Condition”.at the Horticulture Research Farm, Department of Horticulture, Naini Agricultural Institute, Faculty of Agriculture, Sam Higginbottom

University of Agriculture Technology and Sciences, Prayagraj, Uttar Pradesh during Jan-March 2023 to find out the best treatment for better growth and yield of Tomato.

The experiment was laid out in Randomized block design (R.B.D) with 3 replications of 10 varieties VIA T₁ - Horsley, T₂ - Ayushman, T₃ - Ansal, T₄ - Ashutosh, T₅ - Saksham, T₆ - TMTH 2230, T₇ - NARENDAR-2, T₈ - No-575, T₉ - BALWA (LS-1215), T₁₀ - CHITRA (LS-751).

Results and Discussion

A. Growth Parameters

1. Plant Height (cm)

The data on plant height (cm) of different genotypes of tomato are presented in Table 1. At 90 DAT, the maximum plant height (60.63 cm) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (59.62 cm) and Whereas the minimum plant height (51.31 cm) was found to be in T (N0-575).

The variation in plant height might be due to specific genetic make up of different cultivars and prevailing environmental condition. Similar finding were reported by Jasmine and Seemanthini (1994) ^[10].

2. Number of Leaves

The data on number of leaves of different genotypes of tomato are presented in Table 1. At 90 DAT, the maximum number of leaves (95.45) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (38.06) and Whereas the minimum number of leaves (80.68) was found to be in T (N0-575).

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients.

3. Number of branches

The data on number of branches of different genotypes of tomato are presented in Table 1. At 90 DAT, the maximum number of branches (95.45) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (38.06) and Whereas the minimum number of leaves (80.68) was found to be in T (N0-575).

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients. The results are in agreement with the finding of Bahadur and Singh (2005) ^[4]

B. Flowering parameter

The data on Days to first harvest, Days to 50% flowering, Number of flowers /cluster of different genotypes of tomato are presented in Table 2.

At Days to first harvest minimum (31.99) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (32.24).

At Days to 50% flowering minimum (52.29) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (52.20).

At number of flowers/ cluster maximum (11.83) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (11.35).

The maximum value associated with Ansal due to intermodal length better adaptability for the environmental conditions and higher uptake of nutrients. The results are in agreement with the finding of Dudi and Sanwal (2004) ^[6]

4. Number of Fruits/cluster

The data on Number of fruits /cluster of different genotypes of tomato are presented in Table 3.

At number of fruits/ cluster maximum (6.53) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (6.16) whereas minimum was found in (3.22) No575.

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients.

5. No. of fruiting cluster/plant

The data on Number of fruiting cluster/plant of different genotypes of tomato are presented in Table3.

At number of fruiting cluster/ plant maximum (6.06) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (5.58) whereas minimum was found in (2.62) No575

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients.

Table 1: Performance of different hybrids of tomato on plant height (cm), Number of leaves and Number of Branches at 90 DAT.

Treatment No.	Variety	Plant height at 90 DAT	Number of leaves at 90 DAT	Number of branches at 90 DAT
T ₁	Horsely	57.30	89.38	8.75
T ₂	Ayushman	56.42	88.02	8.02
T ₃	Ansal	60.63	95.45	10.35
T ₄	Ashutosh	55.49	87.20	7.88
T ₅	Saksham	59.62	93.46	9.43
T ₆	TMTH 2230	54.38	86.21	7.39
T ₇	Narendra-2	58.23	91.15	8.83
T ₈	No-575	51.31	80.68	6.43
T ₉	Balwa (LS-1215)	53.24	85.16	7.02
T ₁₀	Chitra (LS-751)	52.48	83.35	6.78
F test		S	S	S
S.E(d)(±)		0.174	0.207	0.213
CD0.05		0.369	0.438	0.451
C.V.		0.382	0.288	3.228

Table 2: Performance of different hybrids of tomato on Dates to first harvest, Days to 50% flowering, Number of flower /cluster.

Treatment No.	Variety	Days to first harvest	Days to 50% flowering	Number of flowers/cluster
T ₁	Horsely	34.54	54.46	10.77
T ₂	Ayushman	35.43	55.17	10.27
T ₃	Ansal	31.99	52.29	11.83
T ₄	Ashutosh	36.51	56.21	9.80
T ₅	Saksham	32.24	52.50	11.35
T ₆	TMTH 2230	37.32	57.54	9.57
T ₇	Narendra-2	33.32	53.11	11.24
T	No-575	38.54	60.32	6.81
T ₉	Balwa (LS-1215)	39.68	58.45	8.29
T ₁₀	Chitra (LS-751)	39.43	59.22	7.47
F test		S	S	S
S.E(d)(±)		0.312	0.179	0.217
CD0.05		0.660	0.378	0.460
C.V.		1.064	0.391	2.734

Table 3: Performance of different hybrids of tomato on Number of fruits /cluster, Number of fruiting cluster/plant, Days to first fruit harvest

Treatment No.	Variety	Number of fruits/cluster	Number of fruiting cluster/plant	Days to first fruit harvest
T ₁	Horsely	5.17	5.00	59.74
T ₂	Ayushman	4.69	4.62	60.42
T ₃	Ansal	6.53	6.06	57.28
T ₄	Ashutosh	4.44	4.20	61.42
T ₅	Saksham	6.16	5.58	58.45
T ₆	TMTH 2230	4.00	3.68	62.45
T ₇	Narendra-2	5.81	5.14	59.51
T	No-575	3.22	2.62	65.33
T ₉	Balwa (LS-1215)	3.82	3.28	63.41
T ₁₀	Chitra (LS-751)	3.51	2.96	64.46
Ftest		S	S	S
S.E(d)(±)		0.249	0.228	0.239
CD0.05		0.526	0.483	0.506
C.V.		6.431	6.472	6.478

Table 4: Performance of different hybrids of tomato on Average weight (gm), fruit yield / plant

Treatment No.	Variety	Average weight (gm)	fruit yield / plant
T ₁	Horsely	82.31	2.83
T ₂	Ayushman	81.21	2.61
T ₃	Ansal	88.83	3.44
T ₄	Ashutosh	80.27	2.17
T ₅	Saksham	86.26	3.32
T ₆	TMTH 2230	78.30	1.95
T ₇	Narendra-2	84.17	3.03
T	No-575	74.36	1.30
T ₉	Balwa (LS-1215)	77.36	1.76
T ₁₀	Chitra (LS-751)	76.23	1.48
F test		S	S
S.E(d)(±)		0.791	0.200
CD0.05		1.674	0.423
C.V.		1.196	10.248

Table 5: Performance of different hybrids of tomato on Fruit yield ton/ha, fruit yield / plot (kg)

Treatment No.	Variety	fruit yield ton/ha	fruit yield / plot (kg)
T ₁	Horsely	36.34	24.07
T ₂	Ayushman	34.79	23.22
T ₃	Ansal	39.66	28.54
T ₄	Ashutosh	34.91	22.26
T ₅	Saksham	38.25	26.42
T ₆	TMTH 2230	34.37	20.19
T ₇	Narendra-2	25.24	25.24
T	No-575	32.26	14.52
T ₉	Balwa(LS-1215)	33.69	18.36
T ₁₀	Chitra(LS-751)	33.02	17.50
Ftest		S	S
S.E(d)(±)		0.297	0.384
CD0.05		0.628	0.813
C.V.		1.025	2.135

Table 6: Performance of different hybrids of tomato on Specific gravity, TSS, Vitamin C

Treatment No.	Variety	Specific gravity	TSS	Vitamin C
T ₁	Horsely	1.09	8.01	14.78
T ₂	Ayushman	1.05	7.74	14.25
T ₃	Ansal	1.20	9.14	16.15
T ₄	Ashutosh	1.01	7.12	13.79
T ₅	Saksham	1.16	8.78	15.72
T ₆	TMTH 2230	0.69	6.80	13.29
T ₇	Narendra-2	1.16	8.35	15.05
T	No-575	0.81	4.74	11.68
T ₉	Balwa (LS-1215)	0.91	6.38	12.81
T ₁₀	Chitra (LS-751)	0.87	6.04	12.19
F test		S	S	S
S.E(d)(±)		0.138	0.215	0.150
CD0.05		0.292	0.454	0.319
C.V.		16.953	3.596	1.319

6. Days to first fruit harvest

The data on days to first fruit harvest of different genotypes of tomato are presented in Table 3.

At days to first fruit harvest maximum (6.06) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (5.58) whereas minimum was found in (2.62) No 575.

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients.

7. Average weight in (g)

The data on days to first fruit harvest of different genotypes of tomato are presented in Table 4.

At days to first fruit harvest maximum (6.06) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (5.58) whereas minimum was found in (2.62) No575.

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients. The results are in agreement with the finding of Dutta (1992) [7].

8. Fruit yield / plant

The data on fruit yield/ plant of different genotypes of tomato are presented in Table 4.

At days to fruit yield / plant maximum (3.44) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (3.32) whereas minimum was found in (1.30) No 575.

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients.

9. Fruit yield / plot (kg)

The data on fruit yield/ plot of different genotypes of tomato are presented in Table 5 At fruit yield / plot(kg) maximum (28.54) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (26.42) whereas minimum was found in (14.52) No575.

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients. The results are in agreement with the finding of Khookhar *et al.*, (2002) [24]

10. Fruit yield ton/ ha

The data on fruit yield ton/ha of different genotypes of tomato are presented in Table 5 At fruit yield ton/ha maximum (39.66) was recorded in T₃ (Ansal) followed by T₅ (Saksham) (38.25) whereas minimum was found in (32.26) No575.

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients. The results are in agreement with the finding of Bahadur and Singh (2005) [4]

C. Quality Parameter

11. Specific gravity

In terms of Specific gravity maximum 1.20 was recorded in T₃ (Ansal) followed by T₅ (Saksham) with 1.16 and minimum 0.81 was recorded in T (No-575) in Table 6.

12. TSS

In terms of TSS maximum 9.14 was recorded in T₃ (Ansal) followed by T₅ (Saksham) with 8.78 and minimum 4.74 was recorded in T (No-575) in Table 6.

13. VITAMIN C

In terms of Vitamin C maximum 16.15 was recorded in T₃ (Ansal) followed by T₅ (Saksham) with 15.72 and minimum 11.68 was recorded in T (No-575) in Table 6.

The maximum value associated with Ansal due to higher intermodal length, better adaptability for the environmental conditions and higher uptake of nutrients.

Conclusion

From the above experiment finding it may be concluded that the treatment of T₃ (Ansal) was found to be best in the terms of the growth viz, plant height, days to first flowering, days to 50% flowering, number of fruits per plant and in terms of yield viz, average fruit weight, yield per plant, yield per hectare, and in terms of quality viz, TSS and ascorbic acid. The highest net return was found in the T₃ (Ansal) with (Rs 67985) and the highest B:C ratio was found in the same with (1.32).

From above all treatments T₃ was the best treatment in all the perspective.

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Competing interests

Authors have declared that no competing interests exist.

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