



ISSN Print: 2664-844X
 ISSN Online: 2664-8458
 NAAS Rating (2026): 4.97
 IJAFA 2026; 8(9): 793-796
www.agriculturaljournals.com
 Received: 06-07-2026
 Accepted: 25-08-2026
 Published: 24-09-2026

Ganesh N Karde
 Horticulture Section, College
 of Agriculture, Nagpur,
 Maharashtra, India

SS Moon
 Assistant Professor of
 Horticulture, College of
 Agriculture, Gadchiroli,
 Maharashtra, India

VU Raut
 Professor of Horticulture,
 College of Agriculture,
 Nagpur, Maharashtra, India

PV Shende
 Professor of Agricultural
 Botany, College of
 Agriculture, Nagpur,
 Maharashtra, India

Corresponding Author:
Ganesh N Karde
 Horticulture Section,
 College of Agriculture,
 Nagpur, Maharashtra, India

Performance of tomato varieties for growth and yield characters under Nagpur conditions

Ganesh N Karde¹, SS Moon², VU Raut³, PV Shende⁴

DOI: <https://www.doi.org/10.33545/2664844X.2026.v8.i9k.1954>

ABSTRACT

The present investigation entitled “Performance of Tomato Varieties under Nagpur Conditions” was conducted during the rabi season of 2025–26 at the PG Research Farm, Horticulture Section, College of Agriculture, Nagpur, Maharashtra to evaluate the performance of tomato varieties under Nagpur conditions and to identify a suitable variety for cultivation. Eight tomato (*Solanum lycopersicum* L.) varieties, namely Kashi Adarsh, Kashi Chayan, Kashi Vishesh, Kashi Aman, Arka Vikas, Phule Kesari, Gujarat Tomato-7 and PKM-1 were evaluated in a Randomized Block Design with three replications. Significant variation was observed among the varieties for growth and yield parameters. Kashi Adarsh recorded the maximum plant height at 90 DAT (83.43 cm), whereas Kashi Aman recorded the maximum number of branches plant⁻¹ (38.35) and stem diameter (2.58 cm). The maximum leaf area (57.18 cm²) was recorded in Gujarat Tomato-7. Regarding flowering and yield parameters, the earliest initiation of flower bud was recorded in PKM-1 (26.71 days), while the maximum number of flowers plant⁻¹ (70.02) and yield plant⁻¹ (2.74 kg) were recorded in Kashi Aman. Overall, Kashi Aman exhibited superior performance with respect to major growth, flowering and yield attributes and may be considered a promising variety for cultivation under Nagpur conditions.

Keywords: Tomato, Varieties, Yield, Growth parameters, Nagpur conditions

Introduction

Tomato (*Solanum lycopersicum* L.) is an important vegetable crop cultivated extensively in different parts of the world. It has considerable importance in human nutrition as well as agricultural income because its fruits are consumed in fresh form and are also utilized for preparing various processed products. Tomato fruits provide several essential nutrients and bioactive compounds, making the crop an important component of a balanced diet. Improvement in productivity and consistent crop performance is therefore essential for meeting increasing consumer demand and improving the profitability of tomato cultivation.

The growth, flowering and yield performance of tomato are governed by the interaction of genotype with prevailing environmental conditions and crop management practices. Among these factors, varietal selection plays a major role in determining the productivity of the crop. Tomato varieties differ considerably in their plant height, branching habit, stem development, leaf area, flowering behaviour and yield potential. Hence, the identification of varieties having desirable growth and yield attributes is important for obtaining higher productivity under a particular agro-climatic situation.

The performance of a tomato variety may vary considerably from one region to another because climatic conditions, soil properties, temperature, moisture availability and seasonal variations influence plant growth and reproductive development. A variety showing good performance in one location may not necessarily exhibit similar performance under another environment. Therefore, evaluation of different tomato varieties under specific agro-climatic conditions is necessary to determine their adaptability and identify varieties capable of producing superior growth and yield.

Nagpur and its adjoining areas of the Vidarbha region provide favourable conditions for vegetable cultivation; however, varietal response can differ under the local environmental conditions. Assessment of growth characteristics such as plant height, number of branches, stem diameter and leaf area, along with flowering and yield attributes can provide useful information regarding the adaptability and productive potential of different tomato varieties. Such comparative evaluation can assist growers in selecting varieties better suited to local production conditions.

Materials and Methods

The experiment was conducted during the Rabi season of 2025–26 at the PG Research Farm, Horticulture Section, College of Agriculture, Nagpur, Maharashtra, India. The experimental site is situated at 21.10°N latitude and 79.19°E longitude at an altitude of 310.26 m above mean sea level and represents the subtropical agro-climatic conditions of the Vidarbha region.

Eight tomato (*Solanum lycopersicum* L.) varieties, viz., T₁-Kashi Adarsh, T₂-Kashi Chayan, T₃-Kashi Vishesh, T₄-Kashi Aman, T₅-Arka Vikas, T₆-Phule Kesari, T₇-Gujarat Tomato-7 and T₈-PKM-1 were evaluated. The experiment was laid out in a Randomized Block Design (RBD) with three replications, comprising 24 experimental plots. Each plot accommodated 30 plants at a spacing of 60 × 60 cm with a gross plot size of 3.60 × 3.00 m and net plot area of 4.32 m².

Observations were recorded on selected growth and yield parameters of tomato. Growth parameters included plant height, number of branches per plant, stem diameter and leaf area. Yield-related observations comprised days to initiation of flower bud, number of flowers per plant and yield per plant. Plant height, number of branches per plant and stem diameter were recorded at the specified stages of crop growth, while leaf area was measured using standard procedures. Days to initiation of flower bud and number of flowers per plant were recorded during the flowering period, and yield per plant was determined from the harvested fruits. The recorded observations were statistically analysed using analysis of variance (ANOVA) appropriate for a Randomized Block Design (RBD) following the procedure outlined by Panse *et al.* (1967) [1].

Result and Discussion

1. Growth parameters

The data from Table 1 exhibited the significant difference among the varieties on growth parameters.

1.1 Plant height (cm)

At 30 days after transplanting (DAT), plant height ranged from 27.85 to 35.03 cm, with the maximum height recorded in Kashi Adarsh (35.03 cm) and the minimum in PKM-1 (27.85 cm). However, varietal differences were statistically non-significant at this stage. At 60 DAT, plant height ranged from 51.14 to 61.76 cm, with Kashi Adarsh (61.76 cm) recording the highest value, while PKM-1 (51.14 cm) recorded the lowest. At 90 DAT, the maximum plant height was again observed in Kashi Adarsh (83.43 cm), whereas PKM-1 (70.51 cm) recorded the minimum height. The values of Kashi Adarsh at 60 and 90 DAT were statistically at par with several other varieties. The variation in plant height among varieties may be associated with differences in genetic constitution and varietal growth behaviour which influence vegetative development under a particular agro-climatic environment. Similar varietal variation in plant height was reported by Maurya *et al.* (2024) [2] in tomato, Gumasta *et al.* (2023) [3] in tomato and Sindhu *et al.* (2020) [4] in tomato.

1.2 Number of branches plant⁻¹

The Significant differences among tomato varieties were observed for the number of branches per plant at 60 and 90 DAT, whereas the variation at 30 DAT was non-significant. At 30 DAT, the number of branches ranged from 8.43 to 10.94, with the maximum recorded in Kashi Aman (10.94) and the minimum in PKM-1 (8.43). At 60 DAT, Kashi Aman (26.53 branches plant⁻¹) recorded the highest number of branches, while PKM-1 (16.42) recorded the lowest. At 90 DAT, Kashi Aman maintained its superiority with 38.35 branches plant⁻¹, whereas the minimum value was recorded in PKM-1 (21.70). Kashi Chayan and Phule Kesari were statistically comparable with Kashi Aman at 90 DAT. Differences among varieties may be attributed to their inherent genetic potential for branching and canopy formation. Comparable varietal differences in branching behaviour were reported

by Gumasta *et al.* (2023) [3] in tomato, Mounica *et al.* (2022) [5] in tomato and Sindhu *et al.* (2020) [4] in tomato.

1.3 Stem diameter (cm)

The varieties exhibited significant differences in stem diameter at 60 and 90 DAT, while the variation at 30 DAT was non-significant. Stem diameter at 30 DAT ranged from 0.64 to 0.95 cm with the maximum value in Kashi Aman (0.95 cm) and the minimum in PKM-1 (0.64 cm). At 60 DAT, the thickest stem was recorded in Kashi Aman (1.89 cm) followed by Kashi Chayan (1.78 cm), whereas PKM-1 recorded the lowest value (1.31 cm). At 90 DAT, Kashi Aman (2.58 cm) produced the maximum stem diameter, while PKM-1 (1.91 cm) recorded the minimum. The observed differences in stem thickness could be related to varietal differences in vegetative vigour and stem development. Varieties having stronger vegetative growth may develop thicker stems owing to greater structural development during crop growth. Similar variation in stem diameter among genotypes was reported by Maurya *et al.* (2024) [2] in tomato, Sulaiman *et al.* (2020) [6] in brinjal and Singh *et al.* (2019) [7] in tomato.

1.4 Leaf area (cm²)

Significant variation in leaf area was observed among the tomato varieties at 50 per cent flowering. The leaf area ranged from 38.76 to 57.18 cm². Gujarat Tomato-7 (57.18 cm²) recorded the maximum leaf area and was statistically at par with Kashi Chayan (54.41 cm²). The minimum leaf area was recorded in PKM-1 (38.76 cm²) which remained statistically comparable with Kashi Vishesh and Arka Vikas. Differences in leaf area may be associated with genetic variation governing leaf expansion and canopy development. Similar genotypic variation in leaf area has been reported in tomato by Shivani *et al.* (2017) [8] in tomato, Singh *et al.* (2019) [7] in tomato and Mounica *et al.* (2022) [5] in tomato.

2. Yield parameters

The data from Table 2 exhibited the significant difference among the varieties on yield parameters.

2.1 Initiation of first flower bud (days)

Significant variation was observed among the tomato varieties with respect to days required for initiation of the first flower bud. The values ranged from 26.71 to 38.12 days. PKM-1 (26.71 days) exhibited the earliest flower-bud initiation and was statistically at par with Arka Vikas (28.48 days) and Gujarat Tomato-7 (29.37 days). In contrast, Kashi Aman (38.12 days) recorded the latest flower-bud initiation and was comparable with Phule Kesari and Kashi Chayan. The differences in flowering time among varieties may be explained by variation in their genetic constitution and transition from vegetative to reproductive growth. Similar differences in flowering time were reported by Nisha *et al.* (2023) [9] in brinjal, Das *et al.* (2017) [10] in brinjal and Mehraj *et al.* (2014) [11] in tomato.

2.2 Number of flowers plant⁻¹

The varieties differed significantly in the number of flowers produced per plant. Kashi Aman (70.02 flowers plant⁻¹) recorded the highest number and was statistically at par with Kashi Chayan (65.37), Phule Kesari (64.54) and Kashi Adarsh (62.89). The minimum number of flowers was recorded in PKM-1 (40.73), which was comparable with Gujarat Tomato-7 (46.44) and Arka Vikas (41.57). The differences in flower production may be attributed to varietal differences in genetic potential, plant architecture and reproductive capacity. Similar variation in flower production among tomato genotypes was reported by Jyoti *et al.* (2025) [12] in tomato, Gumasta *et al.* (2023) [3] in tomato and Mehraj *et al.* (2014) [11] in tomato.

2.3 Yield plant⁻¹ (kg)

Significant differences were observed among the tomato varieties for yield per plant. Yield ranged from 1.38 to 2.74 kg plant⁻¹. Kashi Aman (2.74 kg plant⁻¹) produced the highest yield and was statistically at par with Kashi Chayan (2.46 kg plant⁻¹). Kashi Adarsh (2.23 kg) and Phule Kesari (2.40 kg) also recorded comparatively

higher yields. The lowest yield was obtained from PKM-1 (1.38 kg plant⁻¹) which was at par with Arka Vikas (1.57 kg plant⁻¹). The superiority of Kashi Aman in yield per plant may be related to its favourable combination of flower production, fruit-bearing capacity

and number of branches which ultimately contributed to greater accumulation of yield. Similar results were reported by Kumar *et al.* (2018) [13] in tomato, Hossain *et al.* (2017) [14] in tomato and Jatav *et al.* (2017) [15] in tomato.

Table 1. Growth parameters of different varieties of tomato.

Treatments	Plant height (cm)			Number of branches plant ⁻¹			Stem diameter (cm)			Leaf area (cm ²)
	30 DAT	60 DAT	90 DAT	30 DAT	60 DAT	90 DAT	30 DAT	60 DAT	90 DAT	
T ₁ –Kashi Adarsh	35.03	61.76	83.43	9.34	22.76	30.43	0.82	1.57	2.18	49.96
T ₂ –Kashi Chayan	34.23	60.48	81.12	10.63	25.85	34.26	0.89	1.78	2.46	54.41
T ₃ –Kashi Vishesh	29.18	55.17	75.46	9.38	20.91	27.77	0.79	1.50	2.09	43.48
T ₄ –Kashi Aman	32.12	56.84	78.13	10.94	26.53	38.35	0.95	1.89	2.58	48.45
T ₅ –Arka Vikas	30.97	53.56	73.62	8.70	18.09	23.57	0.68	1.40	1.98	40.25
T ₆ –Phule Kesari	29.71	55.86	76.68	10.33	23.58	33.40	0.87	1.72	2.36	48.82
T ₇ –Gujarat Tomato-7	32.86	58.12	79.27	9.67	19.31	26.03	0.76	1.64	2.28	57.18
T ₈ –PKM-1	27.85	51.14	70.51	8.43	16.42	21.70	0.64	1.31	1.91	38.76
<i>F</i> test	N.S.	Sig.	Sig.	N.S.	Sig.	Sig.	N.S.	Sig.	Sig.	Sig.
SE (m) ±	1.56	1.72	2.44	0.54	1.26	1.76	0.06	0.10	0.11	2.30
CD at 5%	—	5.21	7.39	—	3.83	5.34	—	0.31	0.34	6.99

Table 2. Yield parameters of different varieties of tomato.

Treatments	Days to first flower bud initiation (days)	Number of flowers plant ⁻¹	Yield plant ⁻¹ (kg)
T ₁ –Kashi Adarsh	33.02	62.89	2.23
T ₂ –Kashi Chayan	37.67	65.37	2.46
T ₃ –Kashi Vishesh	32.28	52.76	1.91
T ₄ –Kashi Aman	38.12	70.02	2.74
T ₅ –Arka Vikas	28.48	41.57	1.57
T ₆ –Phule Kesari	35.46	64.54	2.40
T ₇ –Gujarat Tomato-7	29.37	46.44	1.76
T ₈ –PKM-1	26.71	40.73	1.38
<i>F</i> test	Sig.	Sig.	Sig.
SE (m) ±	1.24	2.93	0.10
CD at 5%	6.99	8.90	0.31

Conclusion

Overall, Kashi Aman exhibited superior performance and may be recommended for commercial cultivation under Nagpur conditions.

References

- Panse VG, Sukhatme PV. Statistical methods for agricultural workers. Indian Council of Agricultural Research, New Delhi. 1967:361.
- Maurya S, Rajiv, Singh RB, Singh DP, Yadav A, Diwakar MK, Nirankar, Singh VP, Sharma H. Evaluation of per se performance of parental lines and their hybrids for growth, yield and quality attributes in tomato (*Solanum lycopersicum* L.). Int. J. Res. Agron. 2024;7(7):897-902.
- Gumasta V, Nagaich KN, Pandey DK, Saxena CK. Growth performance evaluation of selected commercially cultivated tomato (*Solanum lycopersicum* L.) varieties under the semi-arid conditions of Madhya Pradesh, India. Int. J. Agri. Sci. 2023;15(5):12369-12371.
- Sindhu K, Singh D, Bahadur V, Deepanshu. Evaluation of tomato genotypes for growth, yield and quality attributes in northern agro climatic zone. Int. J. Curr. Microbiol. App. Sci. 2020;9(10):3432-3438.
- Mounica N, Padma E, Madhavi M, Suneetha S. Evaluation of tomato (*Solanum lycopersicum* L.) hybrids for growth and yield attributes under coastal conditions of Andhra Pradesh. Pharma Innov. J. 2022;11(4):1403-1408.
- Sulaiman NNM, Rafii MY, Duangjit J, Ramlee SI, Phumichai C, Oladosu Y, Datta DR, Musa I. Genetic variability of eggplant germplasm evaluated under open field and glasshouse cropping conditions. Agronomy. 2020;10:1-17.
- Singh M, Ameta KD, Kaushik RA, Jat R, Rajawat KS. Performance of tomato (*Solanum lycopersicum* L.) hybrids under polyhouse conditions. Int. J. Curr. Microbiol. App. Sci. 2019;8(5):597-603.
- Shivani D, Misra AC, Panday V, Sajwan P. Evaluation of tomato (*Solanum lycopersicum* L.) hybrids for fruit yield characters in hill region of Uttarakhand. Int. J. Curr. Microbiol. App. Sci. 2017;6(9):1622-1633.
- Nisha RT, Khobragade RI, Bansod VU, Ingole MN, Bele PD. Evaluation of brinjal genotypes for plant growth and variability. Pharma Innov. J. 2023;12(11):2135-2138.
- Das A, Pandit MK, Bairagi S, Saha S, Muthaiah K. A study on floral morphology of brinjal genotypes in Gangetic-alluvial zone of West Bengal, India. Int. J. Curr. Microbiol. App. Sci. 2017;6(10):3323-3331.
- Mehraj H, Mutahera S, Roni MZK, Nahiyen ASM, Uddin AFM J. Performance assessment of twenty tomato cultivar for summer cultivation in Bangladesh. J. Sci. Tech. Env. Info. 2014;01(01):45-53.
- Jyoti M, Wamiq M, Choudhary AS, Ghodeswar P, Satankar N. Performance analysis of tomato (*Solanum lycopersicum* L.) cultivars under the agro-climatic conditions of Balaghat region. J. Adv. in Bio. Biotech. 2025;28(8):1718-1726.

13. Kumar PA, Reddy KR, Reddy RVSK, Pandravada SR, Saidaiah P. Comparative performance of dual purpose tomato hybrids for yield and processing traits. *J. Pharmacognosy Phytochemistry*. 2018;7(1):828-835.
14. Hossain E, Ahamed KU, Shamsuzzaman AM, Haque M, Nahar K. Yield and morphophysiological performance of different tomato varieties in winter season. *Middle East J. Sci. Res*. 2017;25(6):1216-1224.
15. Jatav PK, Chikkeri SS, Kumar NM, Bharathkumar MV, Panghal VPS, Duhan D. Performance of elite genotypes of tomato (*Solanum lycopersicum* Mill.) for yield and quality traits under Hisar conditions. *Int. J. Curr. Microbiol. App. Sci*. 2017;6(8):2698-2706.

How to cite this article: Karde GN, Moon S, Raut V, Shende P. Performance of tomato varieties for growth and yield characters under Nagpur conditions. *International Journal of Agriculture and Food Science*. 2026;8(9):793-796. doi: <https://www.doi.org/10.33545/2664844X.2026.v8.i9k.1954>