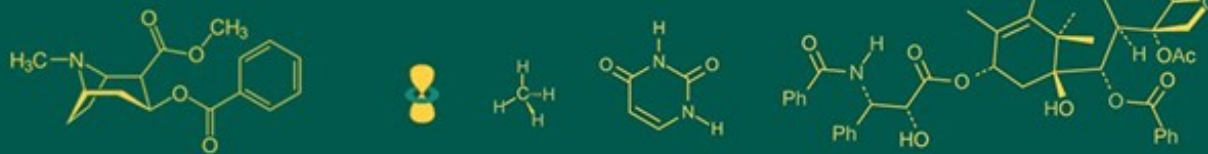


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Performance of Garlic (*Allium sativum* L.) Genotypes for Growth and Yield attributes under Southern Transition Zone of Karnataka

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ABSTRACT

The investigation aimed to evaluate the performance of different garlic (*Allium sativum* L.) genotypes under the local agro-climatic conditions of the Southern Transition Zone of Karnataka to identify high-yielding genotypes with better quality. Twenty garlic genotypes were evaluated in a Randomized Complete Block Design (RCBD) with three replications during Rabi 2025-26, recording various growth and yield parameters. The results revealed significant differences among genotypes, with Yamuna Safed-3 (G-282) recording the maximum plant height, number of leaves, leaf length, and pseudostem length. Regarding yield, Yamuna Safed-3 (G-282) achieved the highest total bulb yield (12.94 t/ha) and marketable yield (12.08 t/ha), while Agrifound Parvati (G-313) recorded the highest collar and bulb neck thickness. It is concluded that Yamuna Safed-3 (G-282), Agrifound Parvati (G-313), and Yamuna Safed-2 (G-50) are high-performing genotypes suitable for further evaluation under the target agro-climatic conditions.

Keywords: *Allium sativum* L., Bulb yield, Genotypes, Southern Transition Zone, Marketable yield

1. Introduction

Garlic (*Allium sativum* L.) is one of the most widely cultivated bulb crops after onion and occupies an important place among spice crops due to its culinary and medicinal value. It belongs to the family Amaryllidaceae (Alliaceae). Kazakhstan in Central Asia is considered the primary centre of origin of garlic while the Mediterranean and Caucasus regions are regarded as the secondary centres of origin (Govind *et al.*, 2015) [1]. The major garlic-producing countries are Spain, Egypt, France, Mexico, Brazil, India, China, Pakistan, Turkey and Sri Lanka. The word garlic is derived from the old English term "garleac" in which "gar" means spear referring to the spear-shaped leaves and "leac" means leek (Parle *et al.*, 2007) [2]. The genus *Allium* is one of the largest genera in the family Alliaceae comprising nearly 450 species and most of them are biennial plants possessing underground storage bulbs and bulbils (Lanzotti, 2006) [3]. These species are economically important and widely utilized for culinary and medicinal purposes (Kamenetsky *et al.*, 2006) [4]. In India garlic is cultivated over an area of 419 thousand hectares with a production of 3589 thousand metric tonnes and an average productivity of 8.57 tonnes per hectare (Anonn., 2024-25). The major garlic-producing states in India are Madhya Pradesh, Odisha, Rajasthan, Karnataka, Uttar Pradesh and Gujarat. Among these states Madhya Pradesh ranks first in area with 207.04 thousand hectares and production with 2138.04 thousand metric tonnes and records a productivity of 10.33 tonnes per hectare. In Karnataka garlic is cultivated over an area of 4.66 thousand hectares with a production of 38.91 thousand metric tonnes with the productivity of 8.35 tonnes per hectare. Dharwad, Haveri and Ballari are the important garlic-growing districts of Karnataka (Anonn., 2024-25).

Garlic is widely used as a flavouring and seasoning agent in several vegetable and meat preparations. In recent years garlic research has gained considerable attention because of its importance as a valuable condiment and health-promoting food material. Garlic is rich in proteins, carbohydrates, phosphorus, potassium, calcium and magnesium. Freshly peeled garlic cloves contain about 62.8 per cent moisture, 29 per cent carbohydrates, 6.3 per cent protein, 1 per cent mineral matter, 0.8 per cent fibre, 0.1 per cent fat, 1 per cent total ash, 0.03 per cent calcium, 0.31 per cent phosphorus, 0.0001 per cent iron, 0.4 mg per 100 g nicotinic acid and 13 mg per 100 g vitamin C (Pandey *et al.*, 2003) [5]. The characteristic pungent, flavour and medicinal properties of garlic are mainly due to sulphur-containing compounds such as allicin, γ -glutamyl cysteine and their derivatives (Tsai *et al.*, 2012) [6]. These sulphur compounds are mainly responsible for the typical aroma and pungency of garlic. Garlic reproduces vegetatively through cloves and belongs to the apomictic group (Ipek *et al.*, 2005) [7]. It is cultivated as an annual crop for bulb production and as a biennial crop for seed production. Garlic is a frost-hardy, bulbous, perennial and erect herb growing up to 30-100 cm in height with narrow flat leaves, small white flowers and bulbils. The scape of garlic is smooth, solid and round

throughout its length unlike onion in which the scape is hollow. The edible underground stem consists of a composite bulb made up of several smaller bulbs known as cloves. When very small cloves are planted or when the crop is grown under poor environmental conditions a single solid clove called “round” is produced. In many garlic types flower stalks are not produced. The inflorescence may remain partially exerted or enclosed within the false stem with bulbils developing as a swelling a few centimetres above the bulb. Garlic possesses a superficial adventitious root system. The bulb is composed of a disk-like stem covered with thin dry scales which form the bases of foliage leaves and support the development of cloves from the axillary buds of younger leaves (Purseghlove, 1975) [8].

Garlic is the second most important bulb vegetable crop after onion because of its immense medicinal and culinary importance. It is extensively used throughout the world for flavouring and seasoning various food preparations. However, the productivity of garlic in India is comparatively low when compared to the international average. In order to enhance productivity, there is a need to identify high-yielding and adaptable genotypes suitable for different agro-climatic regions. Garlic requires specific environmental conditions for flowering and seed production which limits breeding activities to a few states such as Maharashtra and Uttar Pradesh. Therefore, identification and evaluation of suitable genotypes become highly essential for improving garlic cultivation and productivity in other regions particularly in southern Karnataka. Hence the present investigation entitled “Performance of garlic (*Allium sativum* L.) genotypes for growth, yield and quality attributes under Southern Transition Zone of Karnataka” was undertaken to evaluate the performance of different garlic genotypes under local agro-climatic conditions and to identify suitable high-yielding genotypes with better quality.

Materials and Methods

The experiment was conducted at a farmer's field located in Channapura village of Tarikere taluk situated in the Southern Transition Zone (Zone-7) of Karnataka. The experimental site is located at 13.7116° North latitude and 75.8126° East longitude during Rabi 2025-26 (November- March) with 20 garlic genotypes in a Randomized Complete Block Design (RCBD) with 3 replications at a spacing of 15 × 10 cm. Twenty treatments namely DOGR-598, DOGR-244, DOGR-425, DOGR-240, DOGR-460, Yamuna Safed-3 (G-282), Yamuna Safed-2 (G-50), Yamuna Safed (G-1), Yamuna Safed-8 (G-384), Agrifound Parvati (G-313), Agrifound White (G-41), AAS-2, Jagalur local, Bijapur local, Babaleshwar local, Ranebennur local, Sangapur local, Belagavi local, Shivani local and Rajalle Gadde. Well decomposed farmyard manure (FYM) was uniformly applied and thoroughly incorporated into the soil. Then the land was laid out into sub plots of size 2 m × 0.9 m and a total of 60 plots were prepared. Five tagged plants per treatment were selected randomly and observations were recorded on selected plants.

Marketable yield (t/ha)

Marketable bulb yield was calculated by separating rotted, undersized and sprouted bulbs from the total yield. It was expressed in tonnes per hectare.

$$\text{Non-marketable yield (t/ha)} = \text{Total yield per ha} - \text{Marketable yield (t/ha)}$$

Growth parameters

Plant height (cm)

Plant height was measured from ground level to the tip of the longest leaf at 30, 60 and 90 days after sowing. The mean value was calculated and expressed in centimetres.

Number of leaves per plant

The total number of leaves on five randomly selected plants in each treatment was counted at 30, 60 and 90 days after sowing. The average number of leaves per plant was calculated and recorded.

Leaf length (cm)

The length of the fourth leaf from five selected and tagged plants was measured from the point of attachment to the tip of the leaf at 30, 60 and 90 days after sowing. The mean value was calculated and expressed in centimetres.

Leaf width (cm)

The width of the fourth leaf was measured at its widest middle portion from five selected and tagged plants at 30, 60 and 90 days after sowing. The average value was calculated and expressed in centimetres.

Collar thickness (mm)

Collar thickness was measured using a digital vernier calliper on five randomly selected plants at 30, 60 and 90 days after sowing. The mean value was calculated and expressed in millimetres.

Pseudostem length (cm)

Pseudostem length was measured from ground level to the point of emergence of the first green leaf in five selected and tagged plants. The mean value was calculated and expressed in centimetres.

Neck thickness of the bulb (mm)

Neck thickness of the bulb was measured at the narrowest portion between the bulb and pseudostem using a digital vernier calliper at the time of harvest. Observations were recorded from five randomly selected and tagged plants in each treatment and the mean value was expressed in millimetres.

Yield parameters

Duration for harvest (days)

It was recorded from the date of sowing to days required for physiological maturity.

Bulb yield per plot (kg)

Total bulbs in each plot were weighed and expressed in kilograms.

Total bulb yield per hectare (t/ha)

Total bulb yield obtained from the plot was used to calculate the yield of bulbs in tonnes per hectare.

$$\text{Total Bulb Yield (t/ha)} = \frac{\text{Bulb Yield per Plot (kg)}}{\text{Plot Size (m}^2\text{)}} \times \frac{10,000}{1000}$$

Non marketable yield (t/ha)

Bulbs which are rotted, undersized and sprouted were separated from total yield. It was expressed in tonnes per hectare.

Experimental results

Growth parameters

Plant height

At 30 DAS, significant differences among the garlic genotypes were observed for plant height. The highest plant height was recorded in Yamuna Safed-3 (G-282) (29.00 cm), which was on par with Agrifound Parvati (G-313) (28.80 cm) and Yamuna Safed-2 (G-50) (28.20 cm), while Sangapur local recorded the lowest (20.40 cm). At 60 DAS, Yamuna Safed-3 (G-282) recorded the maximum plant height (40.80 cm), followed by Agrifound Parvati (G-313) (40.40 cm) and Yamuna Safed-2 (G-50) (39.80 cm), whereas Sangapur local recorded the minimum (30.80 cm). At 90 DAS, the highest plant height was recorded in Yamuna Safed-3 (G-282) (54.80 cm), which was on par with Agrifound Parvati (G-313) (54.20 cm) and Yamuna Safed-2 (G-50) (53.60 cm), while Sangapur local recorded the lowest (44.20 cm).

Number of leaves per plant

At 30 DAS, significant differences were observed among the garlic genotypes for number of leaves per plant. The highest number was recorded in Yamuna Safed-3 (G-282) (5.90), which was on par with Yamuna Safed-2 (G-50) (5.80) and Yamuna Safed (G-1) (5.70), while Sangapur local recorded the lowest (3.80). At 60 DAS, Yamuna Safed-3 (G-282) recorded the maximum number of leaves (8.90), which was on par with Yamuna Safed-2 (G-50) (8.70) and Yamuna Safed (G-1) (8.60), whereas Sangapur local recorded the minimum (5.70). At 90 DAS, the highest number of leaves was recorded in Yamuna Safed-3 (G-282) (10.30), which was on par with Yamuna Safed-2 (G-50) (10.00) and Yamuna Safed (G-1) (9.90), while Sangapur local recorded the lowest (6.60).

Leaf length (cm)

At 30 DAS, significant differences were observed among the garlic genotypes for leaf length (Table 7). The highest leaf length was recorded in Yamuna Safed-3 (G-282) (31.20 cm), which was on par with Agrifound Parvati (G-313) (30.80 cm) and Yamuna Safed-2 (G-50) (30.40 cm), while Sangapur local recorded the lowest (23.60 cm). At 60 DAS, Yamuna Safed-3 (G-282) recorded the maximum leaf length (46.00 cm), which was on par with Agrifound Parvati (G-313) (45.40 cm) and Yamuna Safed-2 (G-50) (44.80 cm), whereas Sangapur local recorded the minimum (33.80 cm). At 90 DAS, the highest leaf length was recorded in Yamuna Safed-3 (G-282) (55.00 cm), which was on par with Agrifound Parvati (G-313) (54.40 cm) and Yamuna Safed-2 (G-50) (53.80 cm), while Sangapur local recorded the lowest (42.00 cm).

Leaf width (cm)

At 30 DAS, significant differences were observed among the garlic genotypes for leaf width. The highest leaf width was recorded in Agrifound White (G-41) (0.60 cm), which was on par with Agrifound Parvati (G-313) (0.59 cm) and Yamuna Safed-3 (G-282) (0.58 cm), while Sangapur local recorded the lowest (0.40 cm). At 60 DAS, Agrifound White (G-41) recorded the maximum leaf width (1.33 cm), which was on par with Agrifound Parvati (G-313) (1.31 cm) and Yamuna Safed-3 (G-282) (1.29 cm), whereas Sangapur local recorded the minimum (1.00 cm). At 90 DAS, the highest leaf width was recorded in Agrifound White (G-41) (1.82 cm), which was on par with Agrifound Parvati (G-313) (1.80 cm) and Yamuna Safed-3 (G-282) (1.77 cm), while Sangapur local recorded the lowest (1.32 cm).

Collar thickness (mm)

At 30 DAS, significant differences were observed among the garlic genotypes for collar thickness (Table 9). The highest collar thickness was recorded in Agrifound Parvati (G-313) (4.00 mm), which was on par with Agrifound White (G-41) (3.96 mm) and Yamuna Safed-3 (G-282) (3.88 mm), while Sangapur local recorded the lowest (2.50 mm).

At 60 DAS, Agrifound Parvati (G-313) recorded the maximum collar thickness (6.00 mm), which was on par with Agrifound White (G-41) (5.94 mm) and Yamuna Safed-3 (G-282) (5.82 mm), whereas Sangapur local recorded the minimum (3.90 mm). At 90 DAS, the highest collar thickness was recorded in Agrifound Parvati (G-313) (8.00 mm), which was on par with Agrifound White (G-41) (7.92 mm) and Yamuna Safed-3 (G-282) (7.68 mm), while Sangapur local recorded the lowest (5.28 mm).

Pseudostem length (cm)

At 30 DAS, significant differences were observed among the garlic genotypes for pseudostem length (Table 10). The highest pseudostem length was recorded in Yamuna Safed-3 (G-282) (1.90 cm), which was on par with Yamuna Safed-2 (G-50) (1.88 cm) and Yamuna Safed (G-1) (1.84 cm), while Ranebennur local recorded the lowest (1.35 cm). At 60 DAS, Yamuna Safed-3 (G-282) recorded the maximum pseudostem length (6.15 cm), which was on par with Yamuna Safed-2 (G-50) (6.02 cm) and Yamuna Safed (G-1) (5.82 cm), whereas Ranebennur local recorded the minimum (2.45 cm). At 90 DAS, the highest pseudostem length was recorded in Yamuna Safed-3 (G-282) (15.00 cm), which was on par with Yamuna Safed-2 (G-50) (14.72 cm) and Yamuna Safed (G-1) (14.35 cm), while Ranebennur local recorded the lowest (9.55 cm).

Neck thickness of the bulb (mm)

The garlic genotypes differed significantly with respect to neck thickness of the bulb at harvest (Table 11). The highest neck thickness (8.88 mm) was recorded in Agrifound Parvati (G-313), which was statistically on par with Agrifound White (G-41) (8.74 mm) and Yamuna Safed-3 (G-282) (8.46 mm). These were followed by Yamuna Safed-2 (G-50) (8.18 mm) and Yamuna Safed-8 (G-384) (8.02 mm). The lowest neck thickness (5.18 mm) was recorded in Sangapur local, which was significantly lower than the remaining genotypes.

Yield parameters

Duration for harvest (days)

Significant differences were observed among the garlic genotypes with respect to duration for harvest (Table 11). The maximum duration for harvest (152.40 days) was recorded in Agrifound Parvati (G-313), which was statistically on par with Yamuna Safed-3 (G-282) (151.80 days) and Yamuna Safed-2 (G-50) (150.60 days). These were followed by Yamuna Safed-8 (G-384) (150.10 days) and Yamuna Safed (G-1) (149.20 days). The minimum duration for harvest (124.80 days) was recorded in Ranebennur local, followed by AAS-2 (126.80 days) and Sangapur local (127.90 days).

Bulb yield per plot (kg)

Significant variation was observed among the garlic genotypes for bulb yield per plot (Table 12). The highest bulb yield per plot (1.65 kg) was recorded in Yamuna Safed-3 (G-282), which was statistically on par with Agrifound Parvati (G-313) (1.62 kg) and Yamuna Safed-2 (G-50) (1.58 kg). These were followed by Agrifound White (G-41) (1.52 kg) and Yamuna Safed (G-1) (1.45 kg). The lowest bulb yield per plot (0.88 kg) was recorded in Sangapur local, followed by Ranebennur local (0.93 kg) and Babaleswar local (0.98 kg).

Total bulb yield per hectare (t/ha)

The garlic genotypes differed significantly with respect to total bulb yield per hectare (Table 12). The highest total bulb yield per hectare (12.94 t/ha) was recorded in Yamuna Safed-3 (G-282), which was statistically on par with Agrifound Parvati (G-313) (12.71 t/ha) and Yamuna Safed-2 (G-50) (12.39 t/ha). These were followed by Agrifound White (G-41) (11.92 t/ha) and Yamuna Safed (G-1) (11.37 t/ha). The lowest total bulb yield (6.90 t/ha) was recorded in Sangapur local, followed by Ranebennur local (7.29 t/ha) and Babaleswar local (7.69 t/ha).

Marketable yield (t/ha)

Significant differences were observed among the garlic genotypes for marketable yield (Table 13). The highest marketable yield (12.08 t/ha) was recorded in Yamuna Safed-3 (G-282), which was statistically on par with Agrifound Parvati (G-313) (11.88 t/ha) and Yamuna Safed-2 (G-50) (11.53 t/ha). These were followed by Agrifound White (G-41) (11.16 t/ha) and Yamuna Safed (G-1) (10.56 t/ha). The lowest marketable yield (6.18 t/ha) was recorded in Sangapur local, followed by Ranebennur local (6.58 t/ha) and Babaleshwar local (6.99 t/ha).

Non marketable yield (t/ha)

The garlic genotypes exhibited significant variation with respect to non-marketable yield (Table 13). The highest non-marketable yield (0.86 t/ha) was recorded in Yamuna Safed-3 (G-282) and Yamuna Safed-2 (G-50), which were statistically on par with Agrifound Parvati (G-313) (0.83 t/ha) and Yamuna Safed-8 (G-384) (0.83 t/ha). These were followed by Yamuna Safed (G-1) (0.81 t/ha). The lowest non-marketable yield (0.67 t/ha) was recorded in AAS-2, followed by DOGR-240 (0.68 t/ha) and Babaleshwar local (0.70 t/ha).

Discussion

The present investigation revealed significant differences among the garlic genotypes for most of the growth and yield attributes, indicating considerable genetic variability and differential adaptation under the Southern Transition Zone of *Karnataka*. The variation observed may be attributed mainly to differences in genetic constitution and the interaction of genotypes with the prevailing environmental conditions.

Growth parameters

Significant variation was observed among the genotypes for plant height, number of leaves per plant, leaf length, leaf width, collar thickness, pseudostem length and neck thickness. Yamuna Safed-3 (G-282) recorded the maximum plant height, number of leaves, leaf length and pseudostem length, while Sangapur local generally recorded the lowest values. The superior vegetative growth of Yamuna Safed-3 may be associated with its inherent genetic potential, efficient nutrient utilization and greater photosynthetic activity. Increased leaf area and vigorous foliage favour greater assimilate production and its translocation towards developing bulbs. Similar variations among garlic genotypes have been reported by [Anwar et al.](#)

(2012) [9], [Ahmed \(2012\)](#) [10], [Tripathi et al. \(2015\)](#) [11], [Sodh et al. \(2016\)](#) [12] and [Rajyalakshmi et al. \(2024\)](#) [13].

Agrifound White (G-41) recorded the maximum leaf width, followed by Agrifound Parvati (G-313) and Yamuna Safed-3 (G-282). Agrifound Parvati recorded the highest collar and neck thickness, whereas Sangapur local recorded the lowest values. Greater collar and neck thickness may indicate vigorous vegetative development and efficient translocation of assimilates to the bulbs. These results are in agreement with the findings of [Panse et al. \(2013\)](#) [14], [Sangeetha et al. \(2014\)](#) [15], [Chotaliya et al. \(2017\)](#) [16] and [Rajyalakshmi et al. \(2024\)](#) [13].

Yield parameters

Significant differences were observed among genotypes for days to harvest, bulb yield per plot, total bulb yield, marketable yield and non-marketable yield. Agrifound Parvati (G-313) required the maximum number of days to reach harvest maturity, whereas Ranebennur local matured earlier. Longer crop duration can provide greater opportunity for photosynthesis and dry matter accumulation, while early-maturing genotypes may be advantageous where a shorter cropping period is required. Similar observations were reported by [Yadav et al. \(2012\)](#) [17], [Mishra et al. \(2013\)](#) [18], [Sharma et al. \(2015\)](#) [19] and [Islam et al. \(2015\)](#) [20].

Yamuna Safed-3 (G-282) recorded the highest bulb yield per plot, total bulb yield and marketable yield, followed by Agrifound Parvati (G-313) and Yamuna Safed-2 (G-50), whereas Sangapur local recorded the lowest yield. The higher yield of Yamuna Safed-3 may be associated with its superior vegetative growth, greater photosynthetic surface, prolonged growth duration, better bulb development and efficient partitioning of assimilates towards bulbs. Similar results have been reported by [Shigwedha et al. \(2009\)](#) [21], [Yadav et al. \(2012\)](#) [17], [Panse et al. \(2013\)](#) [14], [Sodh et al. \(2016\)](#) [12] and [Rajyalakshmi et al. \(2024\)](#) [13].

Marketable yield followed a similar trend, with Yamuna Safed-3 recording the highest value. Improved bulb development and relatively uniform bulb size may have contributed to higher marketable yield. Non-marketable yield, comprising undersized, malformed, damaged or diseased bulbs, was comparatively lower in improved genotypes such as Yamuna Safed-3 and Agrifound Parvati, while Sangapur local and Ranebennur local recorded higher proportions. These findings are in accordance with [Rahman \(2002\)](#) [22] and [Rajyalakshmi et al. \(2024\)](#) [13].

Table 1. Plant height, number of leaves per plant and leaf length at different growth stages of Garlic (*Allium sativum* L.)

SL No.	Treatments	Plant height (cm)			Number of leaves per plant			Leaf length (cm)		
		30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS
1.	DOGR-598	24.80	37.60	50.40	4.90	7.30	8.30	27.40	40.20	49.40
2.	DOGR-244	23.60	36.20	48.80	4.70	7.00	8.00	26.20	38.80	47.80
3.	DOGR-425	24.20	36.90	49.60	4.80	7.10	8.10	26.80	39.40	48.60
4.	DOGR-240	22.80	34.80	47.00	4.50	6.70	7.70	25.20	37.00	45.80
5.	DOGR-460	24.00	36.80	49.20	4.80	7.20	8.20	26.60	39.20	48.20
6.	Yamuna Safed-3 (G-282)	29.00	40.80	54.80	5.90	8.90	10.30	31.20	46.00	55.00
7.	Yamuna Safed-2 (G-50)	28.20	39.80	53.60	5.80	8.70	10.00	30.40	44.80	53.80
8.	Yamuna Safed (G-1)	26.80	38.20	51.80	5.70	8.60	9.90	29.00	43.00	51.80
9.	Yamuna Safed-8 (G-384)	27.40	38.80	52.40	5.60	8.40	9.70	29.60	43.80	52.60
10.	Agrifound Parvati (G-313)	28.80	40.40	54.20	5.40	8.10	9.30	30.80	45.40	54.40
11.	Agrifound White (G-41)	26.20	37.80	51.00	5.30	8.00	9.10	28.80	42.60	50.80
12.	AAS-2	21.20	31.80	45.00	4.30	6.40	7.40	24.60	35.80	44.20
13.	Jagalur local	22.60	33.80	46.60	4.60	6.80	7.80	25.80	36.80	45.20
14.	Bijapur local	22.20	33.20	46.00	4.40	6.60	7.60	25.20	36.20	44.80
15.	Babaleshwar local	21.80	32.40	45.20	4.10	6.10	7.00	24.40	35.00	43.60
16.	Ranebennur local	20.80	31.20	44.60	4.00	5.90	6.80	24.00	34.40	42.80

(continued on next page)

SL No.	Treatments	Plant height (cm)			Number of leaves per plant			Leaf length (cm)		
		30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS
17.	Sangapur local	20.40	30.80	44.20	3.80	5.70	6.60	23.60	33.80	42.00
18.	Belagavi local	22.40	33.40	46.20	4.50	6.70	7.70	25.40	36.40	45.00
19.	Shivani local	22.00	32.80	45.60	4.30	6.50	7.50	24.80	35.60	44.00
20	Rajalle Gadde	23.20	35.40	48.00	4.90	7.20	8.20	26.00	37.80	46.40
	S.E.m.±	1.13	1.66	2.25	0.23	0.34	0.39	1.25	1.83	2.23
	CD at 5%	3.24	4.75	6.46	0.65	0.97	1.12	3.57	5.23	6.37

Table 2. Leaf width, collar thickness and pseudostem length at different growth stages of Garlic (*Allium sativum* L.)

SL No.	Treatments	Leaf width (cm)			Collar thickness (mm)			Pseudostem length (cm)		
		30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS
1.	DOGR-598	0.53	1.21	1.61	3.28	5.08	6.68	1.68	4.52	12.20
2.	DOGR-244	0.50	1.16	1.55	3.10	4.82	6.32	1.58	4.12	11.70
3.	DOGR-425	0.52	1.19	1.58	3.18	4.94	6.48	1.63	4.30	11.95
4.	DOGR-240	0.47	1.10	1.47	2.92	4.52	5.96	1.48	3.72	11.05
5.	DOGR-460	0.51	1.18	1.57	3.16	4.90	6.42	1.61	4.22	11.85
6.	Yamuna Safed-3 (G-282)	0.58	1.29	1.77	3.88	5.82	7.68	1.90	6.15	15.00
7.	Yamuna Safed-2 (G-50)	0.56	1.26	1.73	3.72	5.60	7.34	1.88	6.02	14.72
8.	Yamuna Safed (G-1)	0.54	1.22	1.66	3.52	5.32	6.96	1.84	5.82	14.35
9.	Yamuna Safed-8 (G-384)	0.55	1.24	1.69	3.62	5.46	7.12	1.76	5.38	13.45
10.	Agrifound Parvati (G-313)	0.59	1.31	1.80	4.00	6.00	8.00	1.80	5.58	13.88
11.	Agrifound White (G-41)	0.60	1.33	1.82	3.96	5.94	7.92	1.72	5.10	13.05
12.	AAS-2	0.44	1.04	1.39	2.72	4.22	5.62	1.42	3.08	10.10
13.	Jagalur local	0.46	1.08	1.45	2.86	4.42	5.84	1.50	3.48	10.82
14.	Bijapur local	0.45	1.06	1.42	2.80	4.32	5.72	1.46	3.34	10.56
15.	Babaleswar local	0.43	1.02	1.36	2.64	4.08	5.46	1.40	2.90	9.95
16.	Ranebennur local	0.42	1.01	1.34	2.58	3.98	5.36	1.35	2.45	9.55
17.	Sangapur local	0.40	1.00	1.32	2.50	3.90	5.28	1.37	2.62	9.78
18.	Belagavi local	0.46	1.07	1.44	2.84	4.36	5.78	1.49	3.40	10.68
19.	Shivani local	0.45	1.05	1.41	2.76	4.26	5.66	1.44	3.18	10.32
20	Rajalle Gadde	0.49	1.14	1.50	3.02	4.72	6.12	1.55	3.82	11.35
	S.E.m.±	0.02	0.05	0.07	0.15	0.23	0.30	0.08	0.21	0.56
	CD at 5%	0.07	0.15	0.21	0.43	0.66	0.86	0.21	0.59	1.61

Table 3. Mean performance of garlic genotypes for neck thickness of the bulb at the time of harvest, duration for harvest, bulb yield per plot, total bulb yield per hectare, marketable yield and non-marketable yield.

SL No.	Treatments	Neck thickness of the bulb (mm)	Duration for harvest (Days)	Bulb yield per plot (kg)	Total bulb yield per hectare (t/ha)	Marketable yield (t/ha)	Non marketable yield (t/ha)
1.	DOGR-598	7.08	139.60	1.30	10.20	9.40	0.80
2.	DOGR-244	6.72	137.20	1.20	9.41	8.65	0.76
3.	DOGR-425	6.94	138.40	1.25	9.80	9.00	0.80
4.	DOGR-240	6.28	135.80	1.10	8.63	7.95	0.68
5.	DOGR-460	6.86	137.90	1.23	9.65	8.88	0.77
6.	Yamuna Safed-3 (G-282)	8.46	151.80	1.65	12.94	12.08	0.86
7.	Yamuna Safed-2 (G-50)	8.18	150.60	1.58	12.39	11.53	0.86
8.	Yamuna Safed (G-1)	7.82	149.20	1.45	11.37	10.56	0.81
9.	Yamuna Safed-8 (G-384)	8.02	150.10	1.40	10.98	10.15	0.83
10.	Agrifound Parvati (G-313)	8.88	152.40	1.62	12.71	11.88	0.83
11.	Agrifound White (G-41)	8.74	148.60	1.52	11.92	11.16	0.76
12.	AAS-2	5.92	126.80	1.02	8.00	7.33	0.67
13.	Jagalur local	6.24	133.20	1.16	9.10	8.34	0.76
14.	Bijapur local	6.08	131.60	1.12	8.78	8.03	0.75
15.	Babaleswar local	5.68	129.40	0.98	7.69	6.99	0.70

(continued on next page)

SL No.	Treatments	Neck thickness of the bulb (mm)	Duration for harvest (Days)	Bulb yield per plot (kg)	Total bulb yield per hectare (t/ha)	Marketable yield (t/ha)	Non marketable yield (t/ha)
16.	Ranebennur local	5.42	124.80	0.93	7.29	6.58	0.71
17.	Sangapur local	5.18	127.90	0.88	6.90	6.18	0.72
18.	Belagavi local	6.14	132.10	1.14	8.94	8.19	0.75
19.	Shivani local	6.02	130.80	1.08	8.47	7.72	0.75
20	Rajalle Gadde	6.58	136.40	1.28	10.04	9.26	0.78
	S.E.m.±	0.33	6.39	0.06	0.47	0.43	0.03
	CD at 5%	0.94	18.29	0.17	1.34	1.24	0.10

Conclusion

Twenty garlic genotypes showed substantial variation for growth, maturity and yield attributes under the Southern Transition Zone of Karnataka. Yamuna Safed-3 (G-282) recorded high performance for several vegetative traits and the highest total bulb yield (12.94 t/ha) and marketable yield (12.08 t/ha). Agrifound Parvati (G-313) recorded the highest collar thickness and bulb neck thickness and produced 12.71 t/ha total bulb yield. Yamuna Safed-2 (G-50) also recorded high yield. These genotypes can be taken forward for further evaluation under the target agro-climatic conditions.

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