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Evaluation of Different Varieties of Single-Type Tuberose for Vegetative, Flowering and Yield Traits

Pushpanjali Bhosale*, V. V. Bhagat, N. Kumar and T. Shaikh

ICAR- Directorate of Floricultural Research, Pune, Maharashtra, India

**Corresponding author*

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A B S T R A C T

Tuberose (*Agave amica* sync. *Polianthes tuberosa*) is a popular flower used as a cut and loose flower. The present experiment was conducted in Randomized Block Design (RBD) with three replications at ICAR-Directorate of Floricultural Research, Pune, Maharashtra during 2020-2021 to evaluate the performance of fourteen single-type tuberoses for Pune agro-climatic conditions. Among the fourteen varieties of tuberose, early spike emergence and minimum days required for spike emergence were recorded in Bidhan Snigdha., whereas the maximum no. of florets per spike and number of florets per spike was recorded in variety GKTC-4. Furthermore, individual floret parameters like floret weight and diameter were recorded as highest in the Prajwal variety. Bidhan Snigdha recorded the highest Rachis length and length of floret. Prajwal recorded the highest loose flower yield per ha. Area.

Introduction

Tuberose (*Agave amica* sync. *Polianthes tuberosa*) is a white waxy fragrant which one of the most important loose flowers as well as the cut flower in India. It is an ornamental bulbous plant, native to Mexico, and belongs to the family Asparagaceae (Thiede and Govaerts, 2017). As loose flowers, they are in great demand for making garlands and veni in Southern India. It is being used for worship, offerings in religious functions, and on auspicious days (Krishnamoorthy, 2014). The flowers are also used for the extraction of valuable essential oil, which is having a greater export demand (Martolia, 2010). In India, it is grown in the states of West Bengal, Andhra Pradesh, Karnataka, Maharashtra, Chhattisgarh, Uttar Pradesh, Gujarat, Odisha, Assam, Tamil Nadu, Uttarakhand, Haryana, and in small areas of North Eastern and other states of India. Hence, location-specific evaluation of varieties will help the growers to select the most suitable and high-yielding variety for that particular region. Critical assessment of germplasm also helps in selecting parents for breeding programs to improve the yield and quality of the flowers. Hence, the present investigation was conducted to study the

relative performance of the fourteen varieties and the variability present among them.

Materials and Methods

The experiment was conducted at research ICAR-Directorate of Floricultural Research, Pune, Maharashtra during 2020-2021.A total of fourteen single-type tuberose varieties were evaluated for growth, flowering, and yield parameters in a randomized complete block design with three replications. Thirty plants per replication were planted at a spacing of 30 x 30 cm on raised beds under open field conditions. The recommended agronomical practices were adopted to raise the crop. Six random plants were selected for recording various observations viz., plant height (cm), number of leaves per plant, spike length (cm), rachis length (cm), number of florets per spike, number of spikes per plant, days to first flowering, floret length (mm), floret diameter (mm), the weight of single floret (g), number of spikes per plant, yield per plant (g) and yield per hectare (q/ha).

Results and Discussion

The various varieties of single-type tuberose were studied concerning growth, flowering, and yield parameters which are greatly affected by the environmental conditions in which they are grown and the genetic makeup of those varieties.

During the period of investigation, the variegated Local Single variety recorded maximum plant height (123.22cm) whereas minimum plant height (64.27cm), Prajwal significantly recorded the maximum number of leaves (34.09) and at par with variety Bidhan Snigdha whereas minimum (13.59) in Hyderabad single. The maximum plant height in Variegated Local Single variety may be due to its genetic character and the environment variation of Pune must be suitable for developing maximum vigour of the plant. The maximum number of leaves in the Prajwal variety among the various evaluated varieties same result reported by Sateesha (2004). Early emergence of spike and minimum days required for first floret opening were recorded in Bidhan Snigdha (65.76 and 75.49,) respectively whereas maximum days required for spike emergence and the first floret opening variety Variegated Local Single (93.08, 103.57)and which was at par with Phule Rajani (92.84, 100.04) respectively. Flower spike length, spike girth, and rachis length are having a direct influence on the quality of tuberose. The maximum spike length was observed in Variegated Local Single (119.62cm) whereas the minimum was in Hyderabad Single (44.47 cm). The maximum number of florets per spike was recorded in GKTC-4 (57.663) and it was comparable with that of Arka Sugandhi (56.00) Hyderabad Single (55.27) and Prajwal (56.17) these results were slightly similar to the reported by Madhumathi *et al.,* (2018). Floret length, diameter, and weight are characteristics to market tuberose as loose flowers for garland making. Variety Bidhan Snigdha reported a maximum floret length (7.79cm) and a minimum recorded in Arka Sugandhi (5.62cm) Moreover, the maximum floret diameter was recorded in Prajwal (0.64cm). Significantly maximum single floret weight (2.14g) which was compatible with Bidhan Snigdha (2.12g). The results are to the findings of Patil *et al.*, (2009); Ramachandrudu *et al.*, (2009) and Krishnamoorthy (2014). The number of spikes per plant directly influences the yield of the particular genotype. The maximum number of spikes per clump was recorded in GKTC-4 (9.57) which was at par with Pune Local Single (9.18). Yield per hectare (129.94q/ha) was recorded as maximum in Prajwal. The increased yield might be due to its capacity to produce the maximum number of florets per spike, the maxi m eight of a single floret, and the diameter floret of which is a genetic makeup of the variety whereas the minimum loose flower yield was recorded in Arka Sugandhi (47.64q/ha). From the present study, it can be concluded that among the fourteen varieties of tuberose Prajwal followed by Bidhan Snigdha and GKTC-4 are suitable for commercial cultivation in Pune Region due to High yielding as compared to the Pune Local single Variety. Which is useful for the farmers for getting good returns and also helpful as a raw material to the oil extraction company.

Table.1 Evaluation of Different cultivars of single type tuberose for growth and flowering parameters

Sr. No.	Treatment	Plant height (cm)	No. of leaves/ Plant	Days to Spike Emergence	Days to first floret opening	Spike length (cm)	Rachis Length (cm)
1	Mexican Single	116.92	17.78	88.51	102.33	103.77	23.43
2	Shringar	89.23	19.22	76.31	94.01	78.32	27.11
3	Arka Nirantara	99.45	18.67	71.10	88.25	90.04	36.58
4	Bidhan Snigdha	105.33	27.53	65.76	75.49	96.01	46.06
5	Bidhan Ujjwal	77.19	25.02	83.02	98.19	62.25	22.37
6	Prajwal	105.74	34.09	89.61	98.62	97.03	31.94
7	GKTC-4	87.44	19.96	91.59	98.70	68.57	24.28
8	Hyderabad Single	89.31	13.59	80.05	91.94	70.43	24.89
9	Pune Local Single	110.03	22.48	71.41	81.55	96.26	19.81
10	Variegated Local single	123.22	21.07	93.08	103.57	119.62	31.70
11	Arka Sugandhi	64.27	13.75	78.36	89.83	44.47	24.50
12	STR -501	93.76	21.62	82.20	93.23	74.51	25.16
13	Sikkim Selection	118.53	25.28	66.34	78.26	107.70	33.34
14	Phule Rajani	88.87	31.83	92.84	100.04	66.10	22.01
	C.D.	4.24	6.59	8.39	8.64	7.92	5.49
	SE(m)	1.45	2.26	2.87	2.96	2.71	1.88

Table.2 Evaluation of Different cultivars of single type tuberose for flowering and yield parameters

Sr. No.	Treatment	Length of floret (cm)	Diameter of Floret (cm)	Wt. of single floret (g)	No. of florets / Spike	No. of spikes/clump	Flower yield/ ha (q)
1	Mexican Single	6.98	0.41	1.25	40.77	6.03	56.54
2	Shringar	6.51	0.43	1.34	50.17	6.87	77.23
3	Arka Nirantara	6.87	0.46	1.46	47.96	7.05	78.02
4	Bidhan Snigdha	7.79	0.58	2.12	44.22	7.94	104.57
5	Bidhan Ujjwal	6.10	0.42	1.34	56.17	7.96	83.68
6	Prajwal	7.13	0.64	2.14	54.59	7.59	129.94
7	GKTC-4	7.03	0.53	1.34	57.66	9.57	85.82
8	Hyderabad Single	6.40	0.44	1.18	55.27	5.60	72.34
9	Pune Local Single	6.86	0.45	1.06	43.94	9.18	51.97
10	Variegated Local single	6.31	0.41	1.27	45.24	4.93	61.99
11	Arka Sugandhi	5.62	0.34	0.76	56.00	3.90	47.64
12	STR -501	6.56	0.42	1.39	40.94	5.85	63.01
13	Sikkim Selection	6.46	0.35	1.06	48.80	5.36	59.22
14	Phule Rajani	6.37	0.59	1.20	45.33	7.27	60.06
	C.D.	0.40	0.08	0.25	10.54	1.37	18.17
	SE(m)	0.14	0.03	0.09	3.61	0.47	6.22

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