



Research Paper

Article history :

Received : 03.06.2013

Revised : 17.09.2013

Accepted : 30.09.2013

Evaluation of double petalled cultivars of tuberose (*Polianthes tuberosa* Linn.) under Delhi condition

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ABSTRACT : In an experiment conducted to evaluate five cultivars of double petalled tuberose (*Polianthes tuberosa* Linn.), namely, Pearl Double, Suvasini, Vaibhav, Hyderabad Double and Swarn Rekha, cv Swarn Rekha could produce significantly taller plants (46.99 cm) followed by cv. Vaibhav (38.87 cm). However, the shortest plants were recorded in cv Pearl Double (29.7 cm). The highest number of leaves (97.8) and tillers (16.51) per clump were produced in cv Suvasini. The maximum leaf width (2.24 cm) and a significantly highest fresh weight (139.07g) as well as dry weight (19.90g) of leaves per clump were recorded in cv Vaibhav. Flowering did not occur in cv Swarna Rekha and remained non-flowering during the entire experiment. The highest flowering duration (25.07 day), spike length (80.38 cm), internodal length of spike (5.25 cm), spike diameter (1.41 cm), fresh weight of cut spike (256.11g), number of florets per spike (47.05), length (6.03 cm), diameter (5.38 cm) and fresh weight (3.34 g) of open floret, length of individual mature floret (5.26 cm) and fresh weight of floret per spike (199.07 g) were recorded in cv Suvasini as compared with rest of the tested cultivars. Significant and the highest number of bulbs (18.73) and bulblets (10.15) per clump, diameter of bulb (3.05 cm) and bulblet (1.18 cm) and weight of individual bulb (32.83 g) and bulblet (3.33g) per clump were recorded in cv. Suvasini which was significantly higher than rest of the cultivars.

KEY WORDS : Bulb, Loose flower, Spikes

HOW TO CITE THIS ARTICLE : Singh, Krishan P. and Singh, Mam C. (2013). Evaluation of double petalled cultivars of tuberose (*Polianthes tuberosa* Linn.) under Delhi condition. *Asian J. Hort.*, 8(2) : 512-514.

Tuberose (*Polianthes tuberosa* Linn.) occupies a prime position in the country among the commercial ornamental bulbous crops because of its highly fragrant flowers which can be used as loose flowers, cut flower and extraction of essential oil etc., is a member of family Agavaceae and native to Mexico. It is estimated that in India tuberose is being commercially cultivated over 30,000 ha mainly in the states of Andhra Pradesh, Assam, Gujarat, Haryana, Karnataka, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal. The flowers of tuberose produce one of the rarest and most valuable aromas with sweet and pleasant fragrance. In the last two decades or so a few new tuberose cultivars have been identified and recommended for commercial cultivation in different regions of our country. Several cultivars had been assessed and evaluated for their performance under different regions of the country taking single petalled and double petalled cultivars together by Bankar and Mukhopadhyay

(1980), Bhattacharjee *et al.* (1981), Pratap and Manohar Rao (2003) and Singh and Misra (2005) and have revealed that a market demand has increased manifold for want of diverse forms and intense fragrance found in them. A particular cultivar may or may not perform satisfactorily in a given location. Hence, five double petalled cultivars of tuberose, *viz.*, Pearl Double, Suvasini, Vaibhav, Hyderabad Double and Swarn Rekha collected from different sources were evaluated for their various vegetative growth, floral and bulb production parameters for two years under Delhi conditions.

RESEARCH METHODS

The present study was conducted at Research Farm of the Division of Floriculture and Landscaping, Indian Agricultural Research Institute, New Delhi-110012. Five double petalled Tuberose cultivars *viz.*, Pearl Double (traditional cultivars), Suvasini, Vaibhav released by IIHR, Bangalore, Hyderabad, Double released by A.N.G. Ranga

Agricultural University, Hyderabad and Swarn Rekha released by National Botanical Research Institute, Lucknow, were evaluated during 2007 to 2009. The experiment was laid out in Randomized Block Design with five replications. The bulbs having a diameter of 3-5 cm, well-seasoned after the dormancy were planted at a depth of 8-10 cm in the plots size of 2.0 m x 2.0 m at 30 x 30 cm spacing in the month of March in both the years. Uniform recommended package of practices were followed along with nutritional application and normal flood irrigation. The data on the plant height (cm), number of leaves, leaf width (cm) and number of tillers/clump, fresh and dry weight (g)/ clump, flowering duration (day), spike and rachis length (cm), internodal length of spike (cm), spike diameter (cm), fresh weight of spike (g), number of florets/ spike, length and diameter of open floret (cm), average weight (g) of single open floret, length (cm) of single mature floret, fresh weight (g) of florets/spike, number of bulbs / clump, average weight (g), diameter (cm) and length (cm) of bulb, number of bulblets / clump, average weight (g), diameter (cm) and length (cm) of bulblet (various vegetative and floral attributes) were recorded time to time upto 10 months after planting. Two years data were pooled and analyzed statistically.

RESEARCH FINDINGS AND DISCUSSION

The statistically analysed data presented on the plant growth and spike characters as presented in the Table 1

showed a significant variation over the years of experimentation for all the traits studied. The vegetative growth characters recorded a significant variation among them and revealed that the cultivar, Swarn Rekha produced significantly taller plants (46.99 cm) followed by cv Vaibhav (38.87 cm). Significantly lower (shorter) plant height was recorded in cv Pearl Double (29.7cm). Significantly higher number of leaves (97.8) and number of tillers (16.51) per clump were produced by cv Suvasini. Significantly maximum width of leaves (2.24 cm) and fresh weight (139.07g) as well as dry weight (19.90g) of leaves per clump were recorded in cv Vaibhav. However, the lowest width of leaves (1.37cm), number of leaves (33.83), number of tillers (8.75), fresh weight (40.16 g), as well as dry weight (5.16g) of leaves per clump were obtained in cv Swarn Rekha. Attaining the varying plant height and leaf characteristics in different cultivars seems to be a genetic character as reported by Biswas *et al.* (2002) and Pratap and Manohar Rao (2003).

It was recorded that flowering did not occur in cv Swarn Rekha (Tables 1 and 2) and which remained non-flowering during the entire experiment in both the years. Significantly higher flowering duration (25.07 day), spike length (80.38 cm), internodal length of spike (5.25 cm), spike diameter (1.41 cm), fresh weight of cut spike (256.11g), number of florets per spike (47.05), length (6.03 cm), diameter (5.38 cm) and fresh weight (3.34 g) of open floret, length of individual mature floret (5.26 cm) and fresh weight of floret

Table 1 : Vegetative growth and flowering parameters in double petalled tuberose cultivars under Delhi conditions (two years pooled data)

Treatments (cultivar)	Plant height (cm)	Number of leaves/clump	Width of leaf (cm)	Number of tillers / clump	Fresh weight of leaves/ clump (g)	Dry weight of leaves /clump (g)	Flowering duration (day)	Spike length (cm)	Rachis length (cm)	Internodal length of spike (cm)	Spike diameter (cm)	Fresh weight/ spike (g)	Number of florets /spike
Pear Double	29.70	62.98	1.95	14.91	46.48	9.62	15.84	61.64	22.83	3.89	1.12	196.93	37.54
Suvasini	32.93	97.83	2.14	16.51	105.33	14.46	25.07	80.38	42.35	5.25	1.41	256.11	47.05
Vaibhav	38.87	80.59	2.24	15.09	139.07	19.89	20.14	58.38	58.38	5.25	1.20	227.56	45.38
Hyderabad Double	31.40	63.01	1.92	12.62	47.75	9.93	15.14	67.80	67.80	4.02	1.19	207.42	43.38
Swarn Rekha	46.99	33.83	1.37	8.75	40.16	5.16	NF*	NF	NF	NF	NF	NF	NF
C.D. (P= 0.05)	3.49	3.48	0.11	1.27	16.56	2.28	2.52	5.89	1.19	0.28	0.06	17.54	NS

* NF = No flowering

Table 2 : Flower and bulb yield parameters in double petalled tuberose cultivars under Delhi conditions (two years pooled data)

Treatments (cultivar)	Length of open floret (cm)	Diameter of open floret (cm)	Weight of single open floret (g)	Length of single mature floret (cm)	Fresh weight of florets /spike (g)	Number of bulbs/ clump	Weight of bulb (g)	Diameter of bulb (cm)	Length of bulb (cm)	Number of bulblets /clump	Weight of bulb let (g)	Diameter of bulblet (cm)	Length of bulblet (cm)
Pear Double	5.35	5.22	2.79	4.61	156.86	15.89	25.45	2.45	8.32	2.70	2.73	1.15	4.18
Suvasini	6.03	5.38	3.34	5.26	199.07	18.73	32.83	3.05	9.57	10.15	3.31	1.18	4.55
Vaibhav	5.54	4.50	1.90	4.77	138.18	16.96	29.85	2.73	8.81	4.57	3.31	1.16	4.08
Hyderabad Double	5.33	5.10	2.86	4.81	161.18	14.48	20.78	2.30	6.58	5.82	3.21	1.09	4.13
Swarn Rekha	NF*	NF	NF	NF	NF	1.88	16.57	1.94	6.30	7.55	1.61	0.99	4.29
CD (P= 0.05)	0.34	0.21	0.22	0.36	17.94	1.66	3.71	0.09	0.45	1.66	NF	0.06	0.27

*NF: No flowering

per spike (199.07 g) were recorded in cv Suvasini when compared with rest of the tested cultivars. Significantly lowest rachis length (22.83 cm), flowering duration (15.14 day), internodal length of spike (3.89 cm), cut spike diameter (1.12 cm), length of open floret (5.33 cm), fresh weight of cut spike (196.93 g), number of florets per spike (37.54 cm) and length of mature floret (4.61 cm) were obtained in cv. Pearl Double. However, the minimum spike length (58.38 cm), diameter (4.50 cm) and weight of individual open floret (1.90 g) and fresh weight of florets per spike (138.18 g) were recorded in cv. Vaibhav. Length and weight of spikes/clump are important characters that contribute to the final economic flower yield in Tuberose. These results of registering the highest length and weight of spikes and number of florets/spikes in cv Suvasini are in close agreement with the reports of Tyagi *et al.* (2008) under agro climatic condition of Meerut (Western Uttar Pradesh).

Flowering duration signifies the fact that longer duration of flowering not only extends the availability of flowers and but also the income of a farmer added over the period of crop. In tuberose cultivar with longer period of flowering are preferred over the short duration as reported by Srivastava *et al.* (2008). Although cultivar (cv), Suvasini has been reported with delayed flowering but recorded with longer duration of flowering under Thrissur (Kerala) conditions (Bhaskar *et al.*, 2006). These findings are in closed agreement with the present findings recorded in case of cv. Suvasini. Significantly higher number of bulbs (18.73) and bulblets (10.15) per clump, diameter of individual bulb (3.05 cm) and bulblet (1.18 cm) and weight of individual bulb (32.83 g) and bulblet (3.31 g) were obtained in cv. Suvasini. Similar findings have also been reported by Martolia and Srivastava (2012). Length of the spikes is preferred in making bouquets and arrangements in vase mostly in case of single petalled cultivars. However, the double petalled cultivars make thick and heavy bouquets and compact arrangements resulting in the more profits in the retail market. The productivity of the crop in terms of bulbs and bulblets harvested with better quality bulbs fetches more returns per unit area to the farmers as recorded in cv Suvasini followed by cv. Vaibhav. Whereas, the significantly lower values for above mentioned bulb and bulblet characteristics were recorded in cv. SWARN REKHA. Therefore, it may be concluded that cvs Suvasini and Vaibhav are ideal for commercial cultivation in and around Delhi condition. The similar results possessing the all economic traits were recorded minimum by Mishra *et al.* (2009) tested under Jammu plains except for the flowering that occurred and produced a minimum of 26.6 flowers/ clump.

Acknowledgement:

The authors are grateful to Dr (Mrs) Meenakshi Srinivas, Principal Scientist, Division of Ornamental Crops, Indian Institute of Horticultural Research, Bangaluru and Dr. B. K. Banergi, Deputy Director and Head, Floriculture Section, National Botanical Research Institute, Lucknow for supplying the planting material of certain tuberose cultivars for this study.

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