

Evaluation of Tuberose Cultivars for Growth and Post-Harvest Attributes under Malwa Plateau of Madhya Pradesh

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ABSTRACT

The present investigation entitled “Evaluation of tuberose cultivars for growth and post-harvest attributes under Malwa Plateau of Madhya Pradesh” was conducted during 2019 to 2020 at Department of Floriculture and Landscape Architecture, K.N.K. College of Horticulture, Mandsaur (MP). The experiment was laid out in a Randomized Block Design (RBD) with three replications and ten treatments. The results of the experiment were revealed that maximum plant height at 30 and 60 DAP were recorded in cv Prajwal, whereas the maximum number of leaves at 30 and 60 DAP and maximum vase life were recorded in cv Mexican Single. The minimum water uptake at 3rd day of vase was observed in cv GK TC-4 and minimum water uptake at senescence stage was observed in cv Phule Rajani.

Keywords Tuberose, Cultivars, RBD, Growth.

INTRODUCTION

Tuberose (*Polianthes tuberosa* L.) commonly known as Rajnigandha in hindi, is an important commercial ornamental bulbous plant flower crop in India and is popular due to its fragrance and long keeping quality of flower spikes. The spikes are useful as cut flowers for vase decoration and bouquets while individual flowers are used for making veni, garland and buttonholes. It is believed to have originated in Mexico. Where, it spread different parts of the world during 16th century. It belongs to the family Amaryllidaceae (Prakash *et al.* 2015) having haploid chromosome number 30. The generic name *Polianthes* is derived from Greek word “polios” meaning shiny or white and “anthos” meaning flower (Naik *et al.* 2018).

Tuberose is hardy, perennial plant. This is having fibrous root and perpetuating itself through bulblets. The leaves are long, narrow and grass like foliage with mild green color. The inflorescence is known as spike. This is can be 25±10 pairs of florets which is commonly open from base to top of the spike (i.e. acropetally). Flowers are waxy, white colored and funnel shaped (Singh *et al.* 2018). The flowers are also used for the extraction of valuable essential oil, which is having a greater demand for concrete and absolute in world wide market and fetches a very good price. It is appreciably cultivated as supply of raw material

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for perfume industry (Gogoi and Talukdar 2019). It cultivated on large scale in also Tamil Nadu, Karnataka, Maharashtra (Madhumathi *et al.* 2018) as cut flower and loose flower crop in India. It comes under genus *Polianthes* and having 14 species out of which *P. tuberosa* is commercially cultivated.

Tuberose thrives well in warm and humid conditions. The medium range of temperature, relative humidity and rainfall required for the optimum growth of the plant. The ideal temperature for tuberose cultivation is 20°C to 30°C while above 40°C and below 10°C retards the growth and development of the crop. It grows well in tropical and subtropical climatic condition. The tuberose does not come up well in temperate condition so it is limitedly grown in temperate condition. Well drained loamy and sandy loamy soils are best suitable for tuberose cultivation. The soil temperature around 20°C suitable for maximum root growth (Singh and Sisodia 2017). Optimum soil pH for flower is 5.5 - 6.0 (Ganesh *et al.* 2013). Tuberose is propagated through bulbs. Usually they are spindle shaped, it has an average diameter of 1.5 cm bulb, should be preferred for propagation. In our country mostly planted in the month of February–March in plain regions where as in hills it is planted in April–May (Singh and Sisodia 2017).

There are mainly two types of varieties in tuberose, which includes single and double type. The single type varieties bear pure white with just one row of corolla segment and having fragrance. Example of the single type varieties are Arka Nirantra, Calcutta Single, GK TC-4, Hyderabad Single, Mexican Single, Phule Rajani, Prajwal, Pune Local Single, Shringar, Sikkim Selection-6. Whereas, double type flowers are white in color with red ting at bud stage, the corolla segment of more than 3 rows and double type varieties have fragrance and some have not, example of double type varieties Calcutta Double, Pearl Double, Pune Local Double, Suwasini, Swarna Rekha, Vaibhav (Bhattacharjee and De 2013).

MATERIALS AND METHODS

The present investigation was carried out in the field of Department of Floriculture and Landscape Architecture, KNK College of Horticulture, Mand-

saur (MP) during the period of May 2019 to March 2020 to study the evaluation of tuberose cultivars and post-harvest attributes. The experiments were laid out in a Randomized Block Design (RBD) with ten treatments, viz. Arka Nirantra, Calcutta Single, GK TC-4, Hyderabad Single, Mexican Single, Phule Rajni, Prajwal, Pune Local Single, Shringar, Sikkim Selection-6, were collected from the Maharana Pratap University of Agriculture and Technology, Udaipur (Rajasthan). The healthy and disease free bulbs were planted at 20 × 20 cm on ridges. After that light irrigation was given. Five plants were selected at random within the net plot area of each treatment and replication for the purpose of recording the observations. The mean value of the data recorded from five plants in each treatment of the three replications was taken to represent a particular variety with respect to a character. The aim of experiments is to find out the suitable cultivar for Malwa plateau of Madhya Pradesh and to improve the economic condition of farmer.

RESULTS AND DISCUSSION

Plant height (cm)

The maximum plant height (26.33 cm) was found in cv. Prajwal, followed by 23.60 cm with cv Sikkim Selection-6, 22.93 cm with Calcutta Single and 22.60 cm with Phule Rajani. Prajwal having significantly better plant height than all other tested cultivars except cv Sikkim Selection-6. However, minimum plant height (18.20 cm) was recorded with cv Mexican Single.

The maximum plant height at 60 DAP (61.13 cm) was recorded with cv Prajwal and it was statistically superior to all varieties investigated. However, minimum plant height (35.73 cm) was recorded in cv GK TC-4. Plant height is an important consideration character. The variation in plant height among the various genotypes might be due to presence of high genetic variation and environmental interaction effects in respect to these attributes. These results are confirmed by Naik *et al.* (2018) in tuberose (*Polianthes tuberosa* L.).

Number of leaves

The maximum number of leaves at 30 DAP (25.93)

Table 1. Different growth and post harvest parameters performance under different cultivars of tuberose.

| Treatments | Plant height (cm) | | Number of leaves | | Water uptake at 3 rd day (ml) | Water uptake at senescence (ml) | Vase life (days) |
|--------------------|-------------------|--------|------------------|--------|--|---------------------------------|------------------|
| | 30 DAP | 60 DAP | 30 DAP | 60 DAP | | | |
| Arka Nirantra | 19.33 | 41.53 | 18.00 | 38.60 | 18.87 | 36.53 | 12.00 |
| Calcutta Single | 22.93 | 39.47 | 18.13 | 41.73 | 26.80 | 34.67 | 12.13 |
| GK TC-4 | 18.67 | 35.73 | 16.60 | 43.00 | 13.93 | 34.47 | 10.27 |
| Hyderabad Single | 18.73 | 37.20 | 16.53 | 39.07 | 31.80 | 37.93 | 8.60 |
| Mexican Single | 18.20 | 43.67 | 25.93 | 46.80 | 26.73 | 30.80 | 12.60 |
| Phule Rajani | 22.60 | 40.47 | 19.27 | 35.40 | 18.53 | 22.03 | 10.47 |
| Prajwal | 26.33 | 61.13 | 17.40 | 32.67 | 20.00 | 34.90 | 10.26 |
| Pune Local Single | 21.47 | 41.40 | 14.93 | 22.67 | 18.93 | 31.27 | 10.00 |
| Shringar | 19.87 | 39.33 | 21.27 | 37.20 | 30.53 | 53.00 | 12.20 |
| Sikkim Selection-6 | 23.60 | 50.13 | 24.87 | 36.67 | 17.67 | 40.40 | 11.20 |
| SEm ± | 1.79 | 3.29 | 3.57 | 5.76 | 1.49 | 2.63 | 0.20 |
| CD at 5% | 5.34 | 9.79 | 10.61 | 17.13 | 4.44 | 7.83 | 0.60 |

was recorded in cv Mexican Single followed by 24.87 with cv Sikkim Selection-6 and 21.27 with cv. Shringar. A similar trend was also observed during the stage of 60 DAP, here also maximum number of leaves per plant (46.80) was observed with cv Mexican Single followed by 43.00 with cv. GK TC-4. While the minimum number of leaves per plant at 30 and 60 DAP was observed in cv. Pune Local Single. The variation in number of leaves may be due to genetic make-up of cultivars and environmental factors. Similar results were also obtained by Madhumathi *et al.* (2018) in tuberose.

Post-harvest parameters

Water uptake at 3rd day of vase (ml)

The maximum water uptake at 3rd day (31.80 ml) was observed in cv Hyderabad Single. However, minimum water uptake at 3rd day (13.93 ml) was observed in cv. GK TC-4 and all these varieties are statistically similar to each other. The variation in water uptake at 3rd day of vase in these varieties might be attributed to the inherent genetic character and environmental factors. Results are in line with those obtained by Singh *et al.* (2018).

Water uptake at senescence (ml)

The water uptake at senescence was statistically sig-

nificant. It was ranged between 22.03 ml to 53.00 ml. The minimum water uptake (22.03 ml) was recorded with cv Phule Rajani. While, the maximum water uptake (53.00 ml) in cv Shringar. The variation in water uptake at senescence must be due to the genetic as well as prevailing climatic condition during the growing period. This fact was also in agreement with Singh *et al.* (2018).

Vase life of spike (Days)

The maximum vase life (12.60 days) was recorded in cv Mexican Single followed by 12.20 days with cv. Shringar, 12.13 days in cv Calcutta Single and 12.00 days with cv Arka Nirantra. All of these varieties are statistically at par to each other. However, the minimum vase life (8.60 days) was recorded with cv Hyderabad Single. The variation in vase life of tuberose flower might be due to the genetic as well as prevailing climatic conditions. Similar results were also observed by Singh *et al.* (2018) in tuberose.

CONCLUSION

On the basis of above finding it may be concluded that, under Malwa plateau of Madhya Pradesh conditions, cultivar Mexican Single was found the best with respect of different parameters of growth as well as for post harvest parameters.

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