

RESPONSE OF GERBERA VARIETIES TO YIELD AND QUALITY PARAMETERS UNDER NATURALLY VENTILATED POLYHOUSE

Anup Ganorkar¹, Shalini Badge², Akshay Jagdale³, Nikhil Taksande⁴ and Madhuri Tayade⁵

ABSTRACT

An experiment was laid out to study the yield and quality performance of gerbera varieties during December, 2014 to December, 2015 at the farm of Horticulture Section, College of Agriculture, Nagpur. The experiment was laid out in Randomized Block Design with seven treatments replicated thrice. The treatments comprised of seven varieties viz., T₁-Barok, T₂-W-Grizzly, T₃-Alecatras, T₄-Vesuvius, T₅-T-Juba, T₆-Faith and T₇-Basic. The results of the experiment revealed that, the variety T-Juba recorded maximum number of flowers plant⁻¹ year⁻¹ (30.11) and square⁻¹ meter year⁻¹ (232.14). As regards quality parameters viz., flower diameter (9.61), flower disc diameter (2.72), stalk length (64.90 cm), stalk diameter (1.14 cm), flower neck thickness (0.88 cm), length of ray florets (5.45), fresh weight of flower (11.76 g) and vase life of flower (12.33 days) were recorded maximum in variety T-Juba whereas, variety W-Grizzly had recorded significantly maximum number of ray florets (68.34).

(Key words : Gerbera, quality, yield, varieties)

INTRODUCTION

Gerbera (*Gerbera jamesonii* L.) also commonly known as Transvaal Daisy is an important cut flower grown throughout the world with long stalks and daisy-like flower, belongs to the family Asteraceae. Various colour has made this flowering plant attractive for use in garden decorations, such as herbaceous borders, bedding, and pots and for cut flowers as it has long vase life.

Gerbera with chromosome number 2n = 50, is considered as one of the nature's beautiful creations because of its excellent flowers with exquisite shape, size and bewitching colours with single and double flowers. The vase life of gerbera lasts for a week which can be extended up to 15 days with selection of suitable cultivars and pre-harvest treatment. It ranks fourth in the International cut flower market and a popular cut flower in Holland, Germany and USA.

Gerbera is one of the important cut flowers grown for domestic as well as for export market. Due to availability of wide range of cultivars and their adaptability to grow on wide range of climatic conditions makes it profitable to the farmers as cut flower. As the commercial cultivation of cut flowers has a good potential, introduction and popularization of high-yielding cultivars of gerbera is gaining importance. Protected cultivation is beneficial for better quality and high yield of flowers. Gerbera flowers grown under polyhouse are in good demand in domestic as well as in the International markets. Therefore, present study was carried out to evaluate seven cultivars of gerbera for their yield and quality under naturally ventilated polyhouse conditions.

MATERIALS AND METHODS

The experiment was conducted under naturally ventilated polyhouse at commercial floriculture unit of Horticulture Section, College of Agriculture, Nagpur during the year 2014-2015. The experiment was laid out in a Randomized Block Design with seven treatments replicated thrice. The treatments consist of gerbera varieties viz., T₁-Barok, T₂-W-Grizzly, T₃-Alecatras, T₄-Vesuvius, T₅-T-Juba, T₆-Faith and T₇-Basic. The healthy uniform two months hardened tissue culture plantlets were collected from Kumar Florist Bioplane, Pune and were planted on the raised beds at 30 cm spacing both in between rows and plants. For the preparation of raised beds garden soil, well rotten FYM and rice husk (2:1:1) were taken and mixed thoroughly. The whole mixture was then sterilized with formalin (0.2 %) and covered with polythene sheet for 48 hours. Then, it was washed 2-3 times with water to remove the residues. Raised beds were prepared of 25 m long, 0.80 m breadth and 45 cm height for planting the gerbera plantlets. Standard package of practices were followed during crop growth period with regular nutrient application through fertigation.

Observations were recorded on number of flower plant⁻¹ year⁻¹ and number of flowers square⁻¹ meter year⁻¹ at harvesting, quality parameters viz., flower diameter, flower disc diameter, length stalk, stalk diameter, flower neck thickness, length of ray floret, number of ray florets and vase life of flower were taken at the time of harvesting and collected data were statistically analyzed as per method suggested by Gomez and Gomez, (1984).

1, 3, 4 and 5. P.G. Students, Horticulture Section, College of Agriculture, Nagpur (M.S.)

2. Asstt. Professor, Horticulture Section, College of Agriculture, Nagpur (M.S.)

RESULTS AND DISCUSSION

Yield parameters

The results obtained from the investigation on yield and quality parameters exhibited significant differences among the gerbera varieties and are presented in table 1.

The data in table 1 revealed that, significant differences were recorded among the gerbera varieties in respect of number of flowers plant⁻¹ and square⁻¹ meter. Significantly maximum number of flowers plant⁻¹ (30.11) and square⁻¹ meter (232.1) were recorded in variety T-Juba which was at par with varieties faith (27.87 and 225.25, respectively) and Basic (26.53 and 223.36, respectively). However, minimum number of flowers plant⁻¹ and square⁻¹ meter was recorded in W-Grizzly (22.79 and 196.15, respectively).

From the above results, T-Juba recorded significantly maximum number of flowers plant⁻¹ and square⁻¹ meter. Variation in number of flowers plant⁻¹ and square⁻¹ meter among the gerbera varieties was mainly attributed due to the variation in production of shoot clump⁻¹, leaf area which is a genetically controlled character.

Similar results were recorded by Wankhede and Gajbhiye (2013). They found that variety Savannah recorded more number of flowers plant⁻¹ under poly house conditions. Sarmah *et al.* (2014) found that among seven varieties of gerbera maximum number of flowers plant⁻¹ recorded in cultivar Dune under polyhouse conditions. Wankhede *et al.* (2004) reported that, gerbera cv Savannah recorded higher number of flowers plant⁻¹ under shade net conditions. Bhuyar *et al.* (2004) revealed that among ten gerbera cultivars, cultivar Ruby Red recorded maximum flower yield under fan and pad cooling system polyhouse conditions.

Quality parameters

The data in table 1 revealed that, significant differences were recorded among the gerbera varieties in respect of quality parameters. Diameter of flower (9.61 cm) and flower disc diameter (2.72 cm) were recorded significantly maximum in variety T-Juba which was followed the varieties W-Grizzly (8.50 cm and 2.44 cm, respectively) and Vesuvius (7.94 cm and 2.23 cm, respectively). However, significantly minimum diameter of flower (7.47 cm) and flower disc diameter (1.83 cm) was recorded in variety Barok. This might be due to inherent characters of individual variety of gerbera. These results are close agreement with the findings of Kumar and Yadav (2013). They revealed that stalk length and disc diameter were recorded maximum in gerbera genotype Piton. Wankhede *et al.* (2004) reported that, gerbera cv Sangria recorded maximum diameter of flower under shade net conditions.

Regarding stalk length and stalk diameter of flower, significantly maximum stalk length of flower (64.90 cm) and stalk diameter of flower (1.14 cm) were recorded in variety T-Juba which was followed by the varieties W-Grizzly (59.76 cm and 0.97 cm, respectively) and Vesuvius (54.23 cm and 0.87 cm, respectively). However, significantly minimum stalk

length of flower (43.70 cm) and stalk diameter of flower (0.60 cm) were recorded in the variety Barok.

Variation of stalk length and stalk diameter of flower might be due to inherent character of individual cultivars and also due to prevalent of congenial microclimatic conditions that prevalent in polyhouse. The results obtained in present investigation are in consonance with the findings of results Kumar *et al.* (2014). They revealed that gerbera variety Winter Queen produced significantly more stalk length and stalk diameter of flower under shade net conditions. Shwetha *et al.* (2014) revealed that stalk length and stalk thickness were recorded maximum in gerbera cv. Julia. Bhuyar *et al.* (2004) reported that gerbera cultivar Rodis showed best results in terms of flower quality parameters under fan and pad cooling system polyhouse conditions.

Flower neck thickness (0.88 cm) and length of ray floret (5.45 cm) were recorded significantly maximum in the variety T-Juba which was followed by the varieties W-Grizzly (0.73 cm and 5.16 cm, respectively) and Vesuvius (0.68 cm and 4.82 cm, respectively). Whereas, the minimum flower neck thickness (0.32 cm) and length of ray floret (4.37 cm) were recorded in the variety Barok. The variation in flower neck thickness due to different gerbera varieties might be due to genetical make up of individual cultivars. The results obtained in this investigation in close agreement with the findings of Shwetha *et al.* (2014). They revealed that stem neck thickness was recorded maximum in gerbera cv. Julia.

Regarding number of ray florets, significantly maximum number of ray floret flower⁻¹ (68.34) was recorded in the variety W-Grizzly which was found to be at par with the variety T-Juba (65.66). Whereas, the variety Barok recorded minimum number of ray floret flower⁻¹ (42.00). The variation in length of ray floret due to different gerbera varieties might be due to inherent characters of individual cultivars. The results obtained in this investigation in close agreement with the findings of results Kumar and Yadav (2013). They reported that gerbera genotype Pink Elegance recorded maximum number of ray florets.

Fresh weight of flower (11.76 g) and vase life of flower (12.33 days) were recorded significantly maximum in variety T-Juba which was followed by varieties W-Grizzly (10.91 g and 10.87 days, respectively) However, variety Barok recorded significantly minimum fresh weight of flower (7.56 g) and vase life of flowers (6.10 days). These might be due to inherent characters of individual cultivars. Also Stalk diameter plays an important role in the post harvest vase life of cut flowers. It has been found that as the diameter of the stalk increases the carbohydrates content of the stalk also increases which helps in increasing the stability of vase life of cut flowers thereby prolonging the vase life of cut flowers. The results obtained in present investigation are in consonance with the findings of Shwetha *et al.* (2014). They reported that maximum vase life was found in gerbera cv. Julia. Deka and Talukdar (2015) revealed that gerbera cv. Red Gem observed longest vase life. Kumar and Yadav

Table 1. Yield and quality parameters of flowers as influenced by gerbera varieties

Treatments	No. of flowers plant ⁻¹ year ⁻¹	No. of flowers square ⁻¹ meter year ⁻¹	Flower diameter (cm)	Flower disc diameter (cm)	Stalk length of flower (cm)	Stalk diameter (cm)	Flower neck thickness (cm)	Length of ray floret (cm)	Number of ray florets	Fresh weight of flower (g)	Vase life of flower (days)
T ₁ - Barok	23.37	205.87	7.47	1.83	43.70	0.60	0.32	4.37	42.00	7.56	6.10
T ₂ - W-Grizzly	22.79	196.15	8.50	2.44	59.76	0.97	0.73	5.16	68.34	10.91	10.86
T ₃ - Alecatras	23.53	218.24	7.62	2.00	50.30	0.64	0.46	4.56	51.33	8.83	8.17
T ₄ - Vesuvius	24.87	205.12	7.94	2.23	54.23	0.81	0.68	4.82	60.44	10.32	9.87
T ₅ - T-Juba	30.11	232.14	9.61	2.72	64.90	1.14	0.88	5.45	65.66	11.76	12.33
T ₆ - Faith	27.87	225.25	7.61	1.89	49.26	0.62	0.40	4.45	44.77	8.30	7.43
T ₇ - Basic	26.53	223.38	7.75	2.07	52.43	0.79	0.55	4.63	56.77	9.39	9.10
SE(m) ±	1.25	3.27	0.25	0.05	1.57	0.03	0.02	0.07	1.22	0.19	0.39
CD at 5%	3.70	9.64	0.73	0.15	4.63	0.10	0.06	0.20	3.60	0.57	1.16

(2013) reported that gerbera genotype Pink Elegance recorded maximum vase life. Bhuyar *et al.* (2004) reported that gerbera cultivar Rodis showed best results in terms of vase life of flower under fan and pad cooling system polyhouse conditions.

REFERENCES

- Bhuyar, A.R., S.D. Khiratkhar, A.W. Shahakar, Y.B. Dharmik, N.A. Deshmukh and V.J. Golliwar, 2004. Growth, quality and yield performance of gerbera under polyhouse condition. *J. Soils and Crops*. **14**(2):317-319.
- Deka Kankana and Madhumita Choudhury Talukdar, 2015. Evaluation of gerbera (*Gerbera jamesonii* Bolus) cultivars for growth and flower characters under Assam conditions. *J. Agri. and Veterinary Sci.* **8**(4):28-30.
- Gomez, K. A. and A. A. Gomez, 1984, Statistical procedure for Agriculture Research, IInd Edition Singapore, A Willey International Publication.
- Kumar, N., R. Manoj, S.N. Sachidananda, Hanumanthe Gowda and A.C. Jnanesh, 2014. Study the growth and flowering of gerbera genotypes under protected cultivation in Tumkur district of Karnataka-India. *Ann. Hort.* **7**(1):78-84.
- Kumar Rajiv and D.S. Yadav, 2013. Evaluation of gerbera (*Gerbera jamesonii* Bolus Ex. Hooker F.) genotypes for vegetative and flower quality under polyhouse. *Hort. Flora Res. Spectrum*. **2**(3):244-246.
- Sarmah Dipika, Bidhan Chandra and Tapas Mandal, 2014. Evaluation of gerbera varieties for growth and flowering under polyhouse in the plains of West Bengal. *International J. Sci. Res.* **3**(12):2277- 2279.
- Shwetha, K.B., G.K. Seetharamu, H. Ansar and Shreeshaail B. Karajanagi, 2014. Assessment of gerbera (*Gerbera jamesonii* Bolus ex. Hooker f.) cultivars under polyhouse conditions. *Trends in Bioscience*. **7**(8):655- 657.
- Wankhede Shruti, V.J. Golliwar, Shital Dagwar, Manjusha Athawle and Nisha Bhaladhare, 2004. Performance of gerbera varieties under shadenet. *J. Soils and Crops*. **14**(2):383-387.
- Wankhede Shruti and R.P. Gajbhiye, 2013. Evaluation of gerbera varieties for growth and flowering under shade net conditions. *International J. Hort.* **3**(9): 42-45.

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