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Evaluation of gerbera varieties for growth and flowering under polyhouse in the plains of west Bengal

Floriculture

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ABSTRACT

A study was conducted to evaluate seven varieties of gerbera (Dune, Goliath, Cacharelle, Forza, Danaellen, Lancaster and Malibu) for growth and flowering under polyhouse at Mondouri Horticulture Research Station of Bidhan Chandra Krishi Viswavidylaya under subtropical plains during 2011-2012. The experiment was laid out in Randomized Block Design (RBD) with three replications having ten plants each in raised beds under polyhouse. Among the varieties studied, there were highly significant variations observed for growth, yield and quality parameters. The data revealed that among all the seven varieties under study, Dune had significantly highest plant height (54.70cm) followed by Cacharelle (51.27cm) and Malibu (46.13cm).The same cultivar also required minimum days (40.23) for visibility of flower bud, maximum flower size (15.27cm), flower number (9.37) and stalk length (80.13 cm). With respect to vegetative parameters like number of leaves per plant was recorded highest in variety Lancastar (42.20) followed by Cacharelle (33.30). Highest number of suckers per plant was found in variety Malibu (4.43) followed by Forza (4.10). On the basis of overall performance, varieties Dune, Goliath, Cacharelle, Malibu were found superior with respect to growth and flowering characteristics under polyhouse in West Bengal condition.

Introduction

Gerbera (*Gerbera jamesonii* L.) also commonly known as Transvaal Daisy is an important cut flower grown throughout the world (Pattanashetti *et al.*, 2012), with long stalks and daisy-like flower, belongs to the family *Asteraceae*. Variety in 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 a long vase life (Bose *et al.,* 2003; Chung *et al.,* 2005; Chauhan, 2005). It ranks fourth in the international cut flower market and a popular cut flower in Holland, Germany and USA (Choudhary and Prasad, 2000).

It is difficult to get good quality cut flowers of gerbera under open-field conditions. To meet the qualitative and quantitative standards, hybrid cultivars have to be grown under protected conditions (Pattanashetti, 2009). Previously, in a performance study of gerbera varieties, Sankar *et al*. (2003), Singh and Ramachandran (2002), Singh and Mandhar (2002) and Kandpal *et al*. (2003) grew gerbera under protected conditions and observed better growth, yield and quality characteristics under protected. Under protected conditions, gerbera grows faster and produces larger and greener leaves with high dry matter content. As a result, the yield of the flowers increases and more side shoots will be formed. Protected conditions provide favorable environment for the growth of the plants by protecting the crop from heavy winds, pests, diseases and other climatic conditions (Khan,1995).The market requirement for cut flowers is very specific and it can be met consistently, only when the crop is grown under protected conditions.

Gerbera as a cut flower has tremendous demand in domestic and international markets. Though, different varieties of gerbera exist in West Bengal, none has been officially released. Hence, it is needed to evaluate varieties for their vegetative, yield and quality characters and finally to recommend the suitable variety for the agro-climatic conditions of West Bengal. Considering the above facts, the present research work was undertaken to study the performance of different varieties of gerbera under polyhouse conditions.

Materials and methods

The experiment was conducted under polyhouse of Mondouri Horticulture Research Station of Bidhan Chandra Krishi Viswavidylaya under subtropical plains during 2011-2012. The experiment was laid out in Randomized Block Design (RBD) with seven treatments replicated thrice. The treatments consist of gerbera varieties viz. Dune (T_1), Goliath (T_2), Cacharelle (T_3), Forza (T_4), Danaellen (T_5), Lancaster (T_6) and Malibu (T_7). The healthy uniform suckers were collected from Kumar Florist Bio Plants, Pune and were planted on the raised beds by following 50 cm spacing both in between rows and plants. The individual sucker was separated carefully from the mother plant. The leaves were pruned to half to reduce the leaf surface in order to restrict the evaporation loss. Standard package of practices was followed during the crop growth period with regular nutrient application through fertigation.

Results and Discussion

There were significant difference among the different varieties of gerbera regarding plant height, number of leaves per plant and suckers per plant (Table1). The maximum plant height was recorded in Dune (54.70 cm) followed by Cacharelle (51.27 cm). Whereas the minimum plant height was recorded in Forza (38.53cm) followed by Danaellen (36.00 cm) and Lancastar (32.47 cm).The maximum number of leaves per plant was recorded in Lancastar (42.20) and Cacharelle (33.30) and minimum was recorded in Goliath (21.23) which was at par with Danaellen (21.10) and Forza (20.53).The highest number of suckers per plant was found in Malibu (4.10) and Forza (4.10) and lowest number was found in Lancastar (3.78) which was at par with Dune (3.74) and Goliath (3.07). The marked variation in vegetative characters may be due to differential characters of individual varieties that expressed their genetic characters. These results were conformity of findings of Kumar *et al.* (2013), Kumar and Yadav (2013) and Wankhede and Gajbhiye (2013).

The results of different varieties of gerbera regarding flower characters were found to be significant (Table 2). The variety Dune required minimum days (40.23) for visibility of flower bud and variety Forza required maximum days (67.17). The maximum flower size was observed in Dune (15.27 cm) followed by Goliath (13.03 cm) and minimum was found in Malibu (11.93) which was at par with Cacharelle (10.93). The size of these flowers may be due to bigger ray florets which are in conformity with the findings of Kumar *et al.* (2013) in gerbera. The bigger diameter of

Dune might be due to the inherent characters of individual varieties.

The highest number of flowers per plant was found in variety Dune (9.37). The same variety Dune recorded longest flower stalk (80.13 cm) and smallest was recorded in Danaellen (51.40 cm) which was at par with Lancastar (50.50 cm). The stalk length is a genetic factor therefore, it is expected to vary among the cultivars as earlier observed by Sarkar and Ghimaray (2004). Stalk length is a very important factor for a cut flower, especially for gerbera flower. It decides the quality cut flowers. As there will be more stalk length more reserved food will be stored in the stalk which will later be available to the flower for longer time period. The results were conformity of findings of Ahlawat *et al.* (2012), Chobe *et al.* (2010) and Hedau *et al.* (2012).

The above mentioned findings indicated that considering the important characteristics, Dune is the best variety having maximum plant height, minimum days for visibility of flower bud, large stalk length, maximum flower size, and more number of flowers per plant. While, Cacharelle also exhibited acceptable physical and flowering quality characteristics, so it can also be cultivated under polyhouse. Malibu and Forza were considered superior varieties as far as number of suckers per plant is concerned. Lancaster and Danaellen are completely rejected due to low yield and poor flower quality. Hence, Dune, Goliath and Cacharelle being better physical adaptation, high yield and excellent flower quality can be successfully cultivated under polyhouse in West Bengal conditions.

Table 1. Vegetative characters of gerbera as influenced by different cultivar

Treatment	Plant height (cm)	Number of leaves per plant	Number of suckers per plant
T_1= Dune	54.70	26.30	3.74
T_2= Goliath	40.37	21.23	3.07
T_3= Cacharelle	51.27	33.30	3.83
T_4= Forza	38.53	20.53	4.10
T_5= Danaellen	36.00	21.10	3.50
T_6= Lancastar	32.47	42.20	3.78
T_7= Malibu	46.13	22.83	4.43
S.Ed (±)	0.90	1.00	0.11
$CD_{0.05}$	2.78	3.06	0.34

Table 2. Flower characters of gerbera as influenced by different cultivar

Treatments	Visibility of flower bud (days)	Size of flower (cm)	Number of flowers per plant	Length of flower stalk (cm)
T_1= Dune	40.23	15.27	9.37	80.13
T_2= Goliath	51.23	13.03	8.73	74.17
T_3= Cacharelle	52.57	11.87	8.00	66.67
T_4= Forza	67.17	10.93	7.30	60.27
T_5= Danaellen	56.60	10.47	5.67	51.40
T_6= Lancastar	54.07	10.47	7.70	50.50
T_7= Malibu	69.07	11.93	6.23	62.13
S.Ed (±)	1.11	0.34	0.20	0.85
$CD_{0.05}$	3.41	1.05	0.61	2.61

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