

Research Article

Varietal Evaluation of Gerbera Cultivars Under Shade Net Conditions

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Gerbera jamesonii L. is one of the most popular ornamental flowers in the world, both as a cut flower and as a pot plant. Evaluation of gerbera for vegetative and flowering characters under shade-net for commercial cultivation as cut flowers has a good potential. Considering the importance of this cut flower, attempts have been made to evaluate different cultivars of gerbera under shade-net conditions for various growth and flowering characters. The experiment was conducted at Model Floriculture Center of GBPUAT, Pantnagar, Uttarakhand. Significant differences were recorded in maximum characters studied. The results revealed that cv. Dune recorded maximum number of leaves (24.65), plant height (28.50 cm), flower stalk length (50.92 cm), duration of flowers (13.8 days), number of flowers/plant/year (24.6) and vase life (8.7 days). However, flower diameter (9.64 cm) and flower stalk diameter (0.94 cm) were recorded in the variety Essance. Cultivar Dune expressed best performance on various growth, flower characters and vase life followed by other cultivars viz. Essance and Dalma.

Hence, *Gerbera jamesonii* cv. Dune should be preferred for commercial cultivation under shade-net for Uttarakhand conditions.

Keywords: Gerbera, Shade net, vegetative growth, flower yield, Vase life

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Introduction

Gerbera jamesonii L. is a genus of plants Asteraceae (daisy family). It is native to tropical regions of South America, Africa and Asia also known as Transvaal daisy or Barberton Daisy. Gerbera is also commonly known as the African daisy. It is important cut flower grown throughout the world [1] scattered from Africa to Madagascar [2] into tropical Asia and South America. It is the latest sensation to Indian Floriculture, commercially grown throughout the world in a wide range of climatic conditions [3]. The domesticated cultivars are mostly a result of a cross between *Gerbera jamesonii* and another South African species *Gerbera viridifolia*. The cross is known as *Gerbera hybrida*. They vary greatly in shape and size. Colours include white, yellow, orange, red, and pink. The centre of the flower is sometimes black. Often the same flower can have petals of several different colours. It is also important commercially. It is the fifth most used cut flower in the world.

With the increase in economic importance of ornamentals in many countries, the international demand for gerbera flowers has also rapidly increased and become one of the most important commercial cut flower for presentation and interior decoration. There is a great demand for gerbera particularly in European markets during winter months and almost throughout the year in India. Since India is situated comparatively closer to major flower consuming countries than its Asian counter parts, it has very good scope and potential in the flower trade, severe winter in major flower producing European countries is also an advantageous factor to India, specially cities like Bangalore, Pune, Hyderabad, Nasik etc. which enjoy moderate climate all through the year besides cheap availability of land and labour has got a great potential for producing gerbera on commercial scale for export as reported [4].

The investigation was taken with the objective to find out the most suitable cultivars for plant growth, flower quality and vase life of Gerbera under shade-net conditions. The present study is one of the pillars to strengthen the edifice of floriculture industry.

Materials and Methods

An experiment was conducted to study the most suitable cultivars of gerbera (*Gerbera jamesonii* L.) for plant growth, flower quality and vase life. Experiment was carried out at Model Floriculture Centre, G. B. Pant University of Agriculture and Technology, Pantnagar (Uttarakhand) based on vegetative and floral characters. The experimental material for the present investigation comprised of eight gerbera varieties, which formed the part of germplasm collection being maintained at the Model Floriculture Centre. The experimental design was RBD and each treatment was replicated five times. All the plant materials used were uniform in growth having planting distance 30 x 30 cm². The planting mixture was fumigated with formaldehyde (2%) solution as a preventive measure against harmful organisms. All the cultural operations were kept uniform for all the varieties.

Observations like number of leaves, plant height, flower stalk length, flower diameter, flower stalk diameter, duration of flowers, number of flowers/plant/year and vase life characters were recorded on five randomly selected plants in each variety. Plant height and flower stalk length were measured in centimeters from the level of soil with the help of meter scale at 30 days interval. This was recorded so that at the end of year all could be calculated in each variety. The flower stalk diameter was measured using vernier caliper and recorded in centimeters. Vase life was recorded in days. The flower stalk was harvested in the morning and at the stage when 2-3 outer rows of disc florets were open. The stalks were kept in vase containing distilled water and observations were recorded till the flowers completely dehisced. The data was analyzed at 5% level of significance statistically.

Results and Discussion

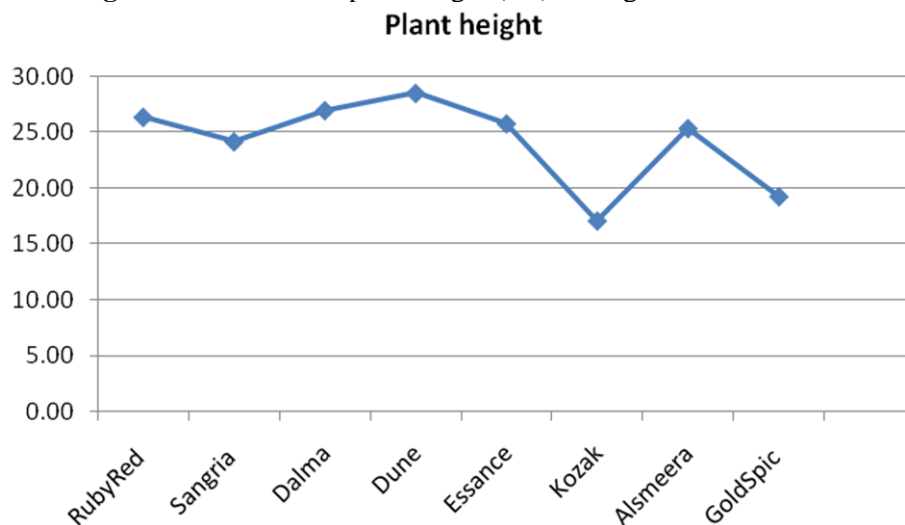
Vegetative Parameters

Comparison of data in **Table 1** reveals that significant variations were found on number of leaves per plant after transplanting for varieties. Maximum number of leaves was exhibited by variety Dune (24.65) which was significantly at par with Dalma (28.87) and Ruby red (21.73) and found higher than all other varieties, whereas minimum number of leaves was found with GoldSpic (11.33).

Table 1 Growth characteristics of gerbera cultivars under Shade-net conditions

Variety	RubyRed	Sangria	Dalma	Dune	Essance	Kozak	Alsmeeera	GoldSpic	CD at 5%
Number of leaves	21.73	19.68	28.87	24.65	18.57	18.57	21.42	11.33	7.33
Plant height	26.36	24.17	26.96	28.50	25.78	17.10	25.35	19.28	3.50

Figure 1 Variations in plant height (cm) among different cultivars



A significant effect on plant height at 30 days after transplanting was found for varieties, as shown in Table 1. Tallest plants were found in variety Dune (28.50 cm) which was significantly at par with all the varieties except Sangria, GoldSpic and Kozak whereas, shortest plant was found with Kozak (17.10 cm). Variation in plant height may be due to genetic factor therefore it is expected to vary among the cultivars. Similar variations in plant height

among gerbera cultivars were observed [5]. This was due to the varietal variations among the different cultivars of gerbera as this all can be attributed to the genetic makeup of the variety.

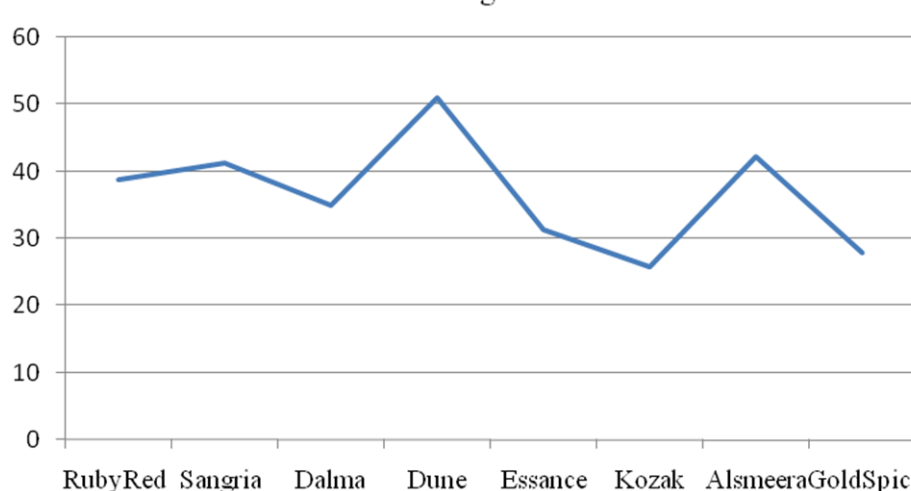
Flowering Parameters

Table 2 shows significant results w.r.t flower stalk length among different cultivars. Maximum length of flower stalk was found in variety Dune (50.92 cm) which was significantly higher than all other varieties, whereas shortest flower stalk was found in Kozak (25.80 cm). This may be due to genetic factor therefore it is expected to vary among the cultivars as earlier observed [6]. Stalk length is a very important factor for a cut flower; it decides the quality cut flowers.

Table 2 Flowering characteristics of gerbera cultivars under Shade-net conditions

Variety	RubyRed	Sangria	Dalma	Dune	Essance	Kozak	Alsmeera	GoldSpic	CD at 5%
Flower stalk length (cm)	38.72	41.3	35.02	50.92	31.36	25.8	42.24	27.9	5.27
Flower diameter	8.68	9.38	9.24	8.62	9.64	7.36	8.42	7	0.76
Flower stalk diameter (cm)	0.76	0.71	0.89	0.79	0.94	0.58	0.68	0.52	0.13

Figure 2 Variations in Flower stalk length (cm) among different cultivars



It is clear from the Table 2 that significant variations were observed for the flower diameter of different varieties. A bigger size flower was observed by variety Essance (9.64 cm) which was significantly at par with Sangria and Dalma. However, smaller size flowers were found in GoldSpic (7.00 cm) variety. The bigger size flowers of some varieties might be due to the inherent characters of individual cultivars.

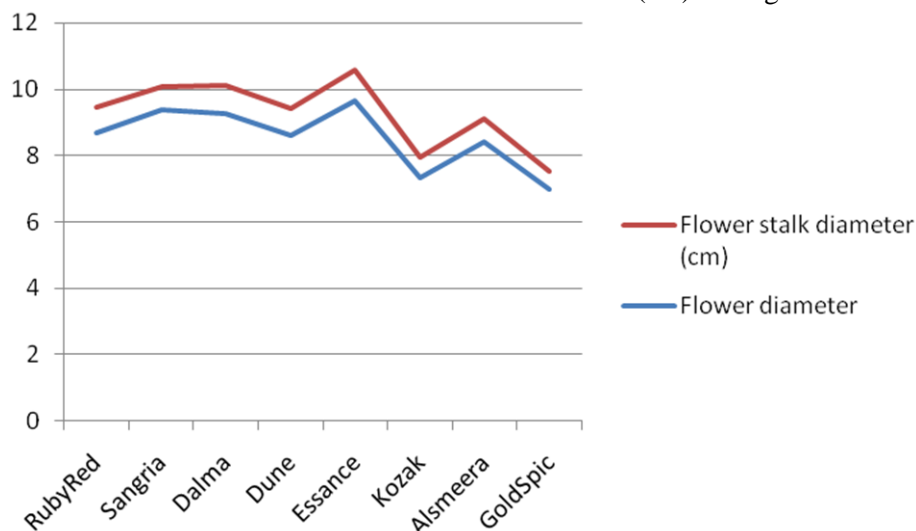
Comparison of data in Table 2 reveals that significant variations were found on flower stalk diameter for varieties. Maximum flower stalk diameter was exhibited by variety Essance (0.94 cm) which was significantly at par with Dalma (0.89 cm) and found higher than all other varieties, whereas minimum flower stalk diameter was found with GoldSpic (0.52 cm). These differences in the flower quality characters may be due to inherent characters of the individual cultivars and reported wide difference in quality parameters among gerbera cultivars [5, 7, 8].

Yield Parameters

It is clear from the **Table 3** that significant variations were observed for the duration of flowers of different varieties. Maximum flower duration was exhibited by Dune (14.8 days) which was significantly at par with Essance and RubyRed. However, minimum flower duration was found in GoldSpic (7.8 days). The differences in flower duration among the cultivars might be due to temperature, prevailing in the region along with their genetic variability. Also, additive genes determine the productivity in gerbera plants [9]. 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.

Table 3 Yield characteristics of gerbera cultivars under Shade-net conditions

Variety	Ruby Red	Sangria	Dalma	Dune	Essance	Kozak	Almeera	Gold Spic	CD at 5%
Duration of flower (days)	13.6	12.0	13.4	14.8	13.8	8.6	12.0	7.8	1.31
Number of flowers per plant per year	26.2	24.6	24.4	24.6	22.6	20.0	20.6	13.4	3.55
Vase life (days)	7.9	7.0	8.0	8.7	8.8	6.8	6.8	5	0.61

Figure 3 Variations in Flower stalk diameter & flower size (cm) among different cultivars

A significant effect on number of flowers per plant per year was found for varieties as shown in Table 3. Maximum number of flowers was found in variety Dune (24.6) which was significantly at par with RubyRed, Sangria and Dalma and found higher than all the varieties. However, minimum number of flowers was found with GoldSpic (13.4). This might be attributed to the more number of leaves per plant as well as plant spread would have resulted in production and accumulation of maximum photosynthesis, resulting the production of more number of flowers with bigger size [9].

The perusal of data (Table 3) revealed that significant variations were found for vase life of different varieties. Maximum vase life was exhibited by variety Dune (8.7 days) which was significantly at par with Essance and found higher than all other varieties, whereas minimum vase life was found with GoldSpic (5 days). The variation in vase life might be attributed to difference in number of thick walled supporting cells in xylem element and phloem fibres and presence or absence of complex ring of secondary thickening in the flower peduncle [10]. It has been emphasized that variation in vase life of different accession might be attributed to genotypic differences.

Conclusion

From the present investigations, it is concluded that *Gerbera jamesonii* cv. Dune should be preferred for commercial cultivation under shade net for Uttarakhand conditions as this cultivars showing the highest mean values for most of the growth and flower characters. The other promising cultivars suitable for Uttarakhand conditions are Dalma, Essance and RubyRed.

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