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Performance of gerbera (*Gerbera jamesonii* L.) Cultivars under open condition in the hill zone of Karbi Anglong district, Assam

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Abstract

An experiment was conducted to evaluate the performance of five cultivars of Gerbera viz. Sangria, Dalma, Bastion, Pink Elegance and Batavia for growth, yield and flower characters. The experiment was conducted under open condition in a Randomized Block Design with four replication at Regional Agricultural Research Station, Diphu, Karbi Anglong, Assam. Significant difference was observed among the cultivars in terms of vegetative growth, flowers characters and yield. Cultivar Pink Elegance recorded the highest plant height and maximum number of leaves per plant. Batavia cultivar took least number of days for visibility of flower bud while Pink Elegance recorded the least number of days for bud opening and full bloom from visibility of flower bud. The highest number of flower per clump was found in Batavia. The highest stalk length was observed both in Sangria and Bastion. Pink Elegance and Bastion recorded the maximum diameter of flower. Self-life was found the highest in Sangria and Batavia and Pink Elegance was found to be superior for the vase life. Overall performance of Batavia, Bastion and Pink Elegance was considered superior among the cultivars.

Keywords: Performance, Gerbera cultivars, growth, flower, vase life, open condition

Introduction

Gerbera is a perennial herb native to South Africa and Asia. It is one of the most popular and valuable ornamental plants and one of the leading cut flowers in the ornamental industry. Gerbera is one of the important high value cut flowers used as fresh and dry flower, aesthetic decoration, making bouquet with high demand in the domestic as well as export market (Singh *et al.*, 2017a) ^[13]. It is ideal for beds, border, pots and rock gardens. Gerbera flowers are available in wide range of colours like yellow, red, orange, cream, white, pink, scarlet, maroon and various other intermediate shades.

The gerbera is currently ranks as the fifth most popular flower in the world behind roses, carnations, chrysanthemums and tulips. They can continue flowering for six months. Field grown cultivars are cultivated in open condition but exotic gerberas are generally cultivated under low cost polyhouse. Further, choice of cultivars is pre-requisite to achieve sustainable productivity under growing conditions (Sangma *et al.*, 2017) ^[9]. Information regarding cultivation of exotic cultivars under open condition is not available. Besides this, performance of each cultivar varies with the region, season and other growing conditions. Considering the commercial importance of this crop, there is a prime need for identification of suitable cultivars for specific regions. Hence, the present study is being conducted to identify the suitable gerbera cultivars under open field condition with respect to growth characters, flower yield and quality for the Hill zone of Karbi Anglong District, Assam. Therefore, the present investigation was carried out with the objective to evaluate the performance of gerbera cultivars under open condition to explore the possibilities of identifying suitable varieties for commercial cultivation.

Materials and Method

The present investigation was carried out during 2020-2021 at Regional Agricultural Research Station, Assam Agricultural University, Diphu, Karbi Anglong District, Assam under open condition. Generally tissue culture plant/exotic cultivar are grown under protected environment but in this experiment the cultivars are grown under open condition. The main objective of this study is to find out suitable cultivar for cultivation under open field condition. The experiment was laid out in a Randomized Block Design with four replications.

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Five genotype/cultivars viz., Sangria, Dalma, Bastion, Pink Elegance and Batavia were selected for the study. Genotypes used in the study were shown in Table given below. The seedlings were planted during the first week of October 2020 at a spacing of 30 cm x 30 cm (row to row x plant to plant), the seed bed were raised up to a height of 30 cm. The plot size were 100 cm x 90 cm. All the cultivation practices were followed as per standard package of practices. All the growth, flowers and yield characters were recorded and analyzed statistically.

Sl. No.	Genotype/ Cultivar	Colour
1	Sangria	Red
2	Dalma	white
3	Bastion	orange
4	Pink Elegance	Light Pink
5	Batavia	yellow

Result and Discussion

Vegetative growth characters

Significant differences were observed for the growth

parameters like plant height, number of leaves and number of suckers per plant and data are presented in Table 1. The plant height was recorded the highest in cultivar Pink Elegance (30.50 cm) followed by both Batavia and Bastion (28.75 cm). The least/lowest plant height was observed in Dalma cultivar (27.75 cm). This might be due to varietal character. It is expected to vary among the cultivars. Earlier researchers also noted similar observations (Singh *et al.*, 2017 a; Soni and Godara, 2017) [13, 15]. The maximum number of leaves per plant were recorded highest in Pink Elegance cultivar (78.25) which was followed by Dalma cultivar (71.5) and the least number (65.25) was recorded in Sangria cultivar. The number of leaves of any cultivar greatly depends on morphological and genetic makeup and similar results were also observed by (Sill *et al.*, 2017; Singh *et al.*, 2017 b) [11, 14].

Variation in leaf production per plant has also been reported by Headu *et al.*, (2012) [4]. Cultivar Batavia recorded the maximum number of suckers per plant (4) and both Dalma and Bastion cultivar produced minimum (3) numbers of suckers per plant.

Table 1: Growth parameters at 240 (Days)

Varieties	Plant height(cm)	No. of leaves/Plant	Nos. of suckers/Plant
Sangria	28.50	65.25	3.50
Dalma	27.75	71.50	3.00
Bastion	28.75	67.00	3.00
Pink Elegance	30.50	78.25	3.75
Batavia	28.75	65.50	4.00
SED(±)	0.85	0.54	0.28
CD at 5%	1.86	1.19	0.62

Flowering characters

Different varieties of gerbera showed significant influence on days required for development of flower. As per Table 2, all the varieties exhibited variation in days for the visibility of flower bud. It is observed from the data that Batavia cultivar took least number of days (77.25) for visibility of flower bud followed by Sangria (80.00) and Dalma (81.25) which were at par with each other. Pink Elegance cultivar recorded the maximum number of days (86.25) for visibility of flower bud which was at par with Bastion cultivar (84.75) which required significantly longer period for visibility of flower bud. Variation in first flower opening was reported in 10 cultivars of gerbera by Rajiv Kumar (2013) [8]. This might be due to their individual varietal characters and environmental factors.

Pink Elegance cultivar took minimum number of days (7.00) to bud opening from visibility of flower bud which was not significantly different from Dalma cultivar whereas, Sangria, Bastion and Batavia cultivars took maximum days (8.00) which might be due to the genetic makeup of the cultivars. Pink Elegance and Sangria cultivar recorded the least and the highest number of days (7.00 and 9.00 days, respectively) to full bloom from bud opening (Table 2.). Variation in flowering parameters viz., days to visibility of flower bud, Days to bud opening from visibility of flower bud and days to full bloom from bud opening showed by different gerbera varieties might be due to variation in their genetic factor. Similar result were reported by Chobe *et al.*, (2010) [3].

Table 2: Flowering characters of gerbera cultivars

Varieties	Days to visibility of flower bud	Days to bud opening from visibility of flower bud	Days to full bloom from bud opening
Sangria	80.00	8.00	9.00
Dalma	81.25	7.75	7.75
Bastion	84.75	8.00	8.75
Pink Elegance	86.25	7.00	7.00
Batavia	77.25	8.00	8.25
SED(±)	0.44	0.36	0.37
CD at 5%	0.97	0.78	0.82

Flower quality characters

From Table 3 it is observed that the highest number of flowers per clump was recorded in Batavia cultivar (32.75) which was significantly superior to other cultivars. This was followed by Dalma (27.00) and Bastion (27.75). The cv. Pink Elegance recorded the least number with 26.00 number of flower per clump. The maximum size of flower was observed

in Bastion cultivar (11.52 cm) which was at par with Pink Elegance (11.20 cm) and followed by Sangria (10.92 cm). There was significant variation among cultivars in terms of flower production. The results corroborate with the findings of Sarmah *et al.*, (2014) [10] and Sill *et al.* (2017) [11] who recorded variation of gerbera productivity among cultivars. Such variation in flower yield was reported in

gerbera by Singh *et al.*, (2016). The difference in flower production 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. This was in accordance with the findings of Barooah and Talukdar (2009)^[2].

The flower diameter showed significant variation among the gerbera cultivars and the maximum diameter was in Bastion (11.52 cm) while minimum was recorded in Dalma (10.37 cm), the floret diameter is a quality parameter which might be obtained due to bigger ray florets and the results are in conformity with the findings of Kumar *et al.*, (2013)^[5] and Mahmood *et al.*, (2013)^[6].

The highest stalk length was recorded in both Sangria and Bastion (44.50 cm) cultivars which were superior to other varieties. The lowest stalk length was found in Pink Elegance cultivar (33.75 cm). Flower stalk length is a very important quality character for gerbera cut flower and it indicates more reserved food in the stalk which will later be available to the flower for longer period. The findings are in accordance with

the result reported by Sill *et al.*, (2017)^[11] Further, being a genetic factor stalk length varied among cultivars tested in the study and similar observation were found by Ahlawat *et al.*, 2012; and^[1] *et al.*, Sarmah 2014^[10]. The maximum diameter of flower stalk (0.95 cm) was found in both Pink Elegance and Bastion and the minimum diameter (0.77 cm) was recorded in Dalma cultivar.

Observation on self-life (days) and vase life (days) was recorded in all the cultivars. And from the Table 3 it is found that both Sangria and Batavia recorded highest self-life (25.75 days) which were not significantly different from Dalma and Bastion (24.75 days) and minimum vase life was observed in Pink Elegance (23.00 days). But the maximum vase life was observed in Pink Elegance cultivar (8.25 days), not differed significantly from Sangria cultivar (7.75 days) and followed by Dalma cultivar (7.25 days). The Bastion cultivar (5.50 days) recorded the least number of vase life in days and at par with Batavia (6.25). Similar result was reported by (Kumar *et al.*, 2014)^[7].

Table 3: Flower quality characters of gerbera cultivars

Varieties	No. of flower/ clump	Size of flower(cm)	Length of flower stalk (cm)	Dia. Of flower stalk (cm)	Self-life (cm)	Vase life(days)
Sangria	31.00	10.92	44.50	0.90	25.75	7.75
Dalma	27.00	10.37	41.25	0.77	24.75	7.25
Bastion	27.75	11.52	44.50	0.95	24.75	5.50
Pink Elegance	26.00	11.20	33.75	0.95	23.00	8.25
Batavia	32.75	10.77	43.75	0.92	25.75	6.25
SED(±)	0.87	0.21	1.42	0.03	0.81	0.37
CD at 5%	1.90	0.47	3.11	0.07	1.77	0.81

Conclusion

Results obtained from the study showed that the Pink Elegance cultivar recorded the highest plant height and the maximum number of leaves per plant with respect to growth characters, which is considered as superior to other cultivars. Batavia was considered as superior in terms of number of suckers per plant. For the flower characters Bastion was considered as superior for the parameters like size of flower and length of flower stalk. However, Batavia was recorded with maximum number of flower per clump and self-life. The highest vase life was found in Pink elegance cultivar. From the present study, it may be concluded that Gerbera cultivars viz., Batavia, Pink Elegance and Bastion may be profitably cultivated under open condition in the hill zone of Karbi Anglong District, Assam.

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