



Evaluation of different Gerbera Cultivars for Growth and Flower Characteristics under Naturally Ventilated Polyhouse under Nagaland Condition

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ABSTRACT

On- farm trail was conducted in Longleng district of Nagaland during 2016-17 to compare the phenological development and production potential of four varieties of gerbera viz. Silvester, Stanza, Rosalin and Brilliance at farmers field under naturally ventilated polyhouse condition in Longleng District of Nagaland. Result revealed that Rosalin recorded maximum leaf length (49.68 cm), plant spread (57.82 cm), flower diameter (12.04 cm), diameter of trans floret (7.52 cm), diameter of disc floret (3.4 cm), Peduncle diameter (0.8 cm), length of ray floret (5.44 cm), width of ray floret (1.12 cm), whereas Stanza recorded maximum leaf breadth (19.76 cm), no. of ray floret (73.4 nos.), vase life (13.2 days), Silvester recorded maximum in plant height (52.04 cm), no. of leaf/plant (19.6 nos.) and no. of suckers /plant (2.2 nos.), no. of flowers/plant (8.4 nos.) and Brilliance recorded maximum Peduncle length (70.96 cm). Vase life of flower was recorded significantly higher in Stanza (13.2 days) as compared to other cultivars and minimum with Brilliance (10.8 days). Rosalin and Stanza appears to be the best cultivars under Longleng climatic condition as compared to Silvester and Brilliance in terms of vegetative growth and flowering quality characters.

KEYWORDS

Gerbera varieties, growth, yield attributes, vase life

INTRODUCTION

Gerbera (*Gerbera jamesonii*) belongs to the family Asteraceae commonly known as Transvaal Daisy, Barberton or African Daisy is considered as one of the nature's beautiful creations because of its excellent flowers with exquisite shape, size and bewitching colours. It is an important cut flower regarded as latest sensation to commercial floriculture industry on account of its remarkable form, magnificent colour variation, unsurpassed beauty and potentialities in the local, domestic and international cut flower market. Gerbera has now become one of the most important commercial cut flower for presentation and interior decoration. Among the flowers, gerbera has comparatively long vase life of usually 10-15 days which can be extended up to 30 days with suitable cultivars and pre-harvest treatment. Floriculture is fast emerging as highly competitive commercial and economic activity with potential for earning valuable foreign exchange by liberalization of economy and import policy. North east has very good scope and potential in the flower trade with moderate climate throughout the year besides cheap availability of land and labour has got a great potential for producing gerbera on commercial scale for export as reported by Kumari *et al.* (2010). Though a wide array of gerbera cultivar is grown in north east region, it has become inevitable to evaluate new potential cultivar for their qualitative and quantitative characters. Evaluation of gerbera genotypes under polyhouse has also been reported by earlier workers (Kumar and Deka, 2012).

Nagaland required lot of flowers around the year, particularly during the winter season. In Nagaland the demand of cut flowers are very high, the grower could not fulfill the demand of the consumer. Hence they meet the demand from the neighboring state like Assam and West Bengal. Presently, the cut flower is grown in 8.85 ha area in Nagaland, of which gerbera is cultivated in an area of about 0.98 ha during the 2014-15. Productivity of gerbera is low in the Nagaland State as compared to the national average mainly due to lack of high yielding variety of Gerbera. Hence, considering the importance of this cut flower, an attempt was made to identify the best promising gerbera cultivars suited to Longleng District of Nagaland for higher productivity and profitability.

MATERIALS AND METHOD

A field experiment was conducted at farmer's field of Krishi Vigyan Kendra, Longleng, ICAR Research Complex for NEH Region, Nagaland Centre, Jharnapani, Medziphema during the year 2016-17 and 2017-18. The experimental site was located between at 26 6' 0" N Latitude, 94 52' 0" E Longitude with an altitude of 1366 m above mean sea level. The soil of the experimental field was sandy loam and acidic in reaction (pH 5.3), high in organic carbon (0.97%), medium in available N (311 kg/ha) and medium in available P (13.8 kg/ha) and K (237 kg/ha). Yearly mean maximum (28.14°C) and minimum temperature (16.64°C) and monthly maximum and minimum temperatures were varying from 23.9°C to 34.35°C and 7.74°C to 25.06°C, respectively. Total rainfall received was 1406 mm during the year 2016-17. Four cultivars procured from private company viz. Stanza, Silvester, Rosalin, Brilliance were selected for this study. Healthy tissue cultured plants were planted with 30 cm spacing both in between rows and plants on the

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raised beds of 20 cm height. Standard recommended package of practices were followed during the crop growth period. The experiment was laid out in randomized block design (RBD) with three replications. Five plants were selected from each replication for recording the observation. Observation on different parameters on growth (plant height, no. of leaf /plant, leaf length, leaf width, plant spread, no. of suckers /plant), floral quality (flower diameter, diameter of trans floret, diameter of disc floret, peduncle length, peduncle diameter, No. of ray floret, length of ray floret, width of ray floret) and vase life were recorded. The mean value of the recorded data on biometrical parameters were subjected to statistical analysis as per the procedure given by [Panse and Sukhatme \(1984\)](#).

Table 1: Characteristics of different Gerbera cultivar

Gerbera cultivars	Characteristics
Rosalin	The flower is a standard cut flower, pink in colour with black centre, flower diameter range from 11 cm to 13 cm. It is a semi double flower type with a stem length of 50-60 cm. Cut flower yield ranges 230-250 per m ² with vase life about 10-12 days.
Stanza	The flower is red in colour and semi double flower type cultivar, black colour in centre with a flower diameter about 11 cm – 13 cm and average stem length of 55-60 cm. Flower yield per m ² in a year is 210-230 with a vase life of 14 – 16 days.
Silvester	The cut flower white in colour with green colour in centre. Flower diameter range 10 cm - 13 cm. It is a semi double flower type with a stem length of 60-65 cm. This cultivar give 250-270 flower per m ² in a year and vase life is about 12-14 days.
Brilliance	The cut flower is yellow in colour with black colour in centre. Flower diameter ranges 11 cm - 12 cm. It is a semi double flower type with a stem length of 65-70 cm. This cultivar give 230-250 nos. of cut flower per m ² in a year with vase life is about 13-16 days.

RESULTS AND DISCUSSION

Vegetative parameter

The results obtained from the present investigation on growth characteristics are presented in [Table 2](#). Plant height was significantly recorded higher in Silvester (52.04 cm) followed

Table 2: Evaluation of Gerbera cultivars for vegetative characters under naturally ventilated poly house

Cultivars	Plant height (cm)	No. of leaf/plant	Leaf length (cm)	Leaf breadth (cm)	Plant spread (cm)	No. of suckers/plant
Stanza	49.06	12.8	45.9	19.76	57.70	1.8
Silvester	52.04	19.6	47.9	14.52	54.67	2.2
Rosalin	47.8	15.4	49.68	14.1	57.82	1.4
Brilliance	39.4	11	39.3	13.36	52.8	1.6
SEm (±)	2.26	1.49	1.92	0.84	3.2	0.35
CD(P=0.05)	6.9	4.6	5.9	2.6	10.2	1.10

by Stanza (49.06 cm) and Rosalin (47.8 cm) and minimum plant height was recorded 39.4 cm with Brilliance. Percentage plant height was found 32.0 %, 24.0 %, and 21.3 % higher with Silvester, Stanza and Rosalin respectively than Brilliance. Other researcher, [Kallol and Siradar \(2016\)](#) also reported that Stanza recorded maximum plant height in their trial. Variation in plant height among gerbera cultivars was observed by [Reddy et al. \(2003\)](#).

The variation in number of leaves/plant was significant among the different cultivars of gerbera. Maximum number of leaves/plant was recorded in Silvester (19.6) followed by Rosalin (15.4 nos.) and minimum with Brilliance (11.0 nos.). Number of leaves/plant was recorded with Silvester and Rosalin showed at par with each other. These results were in conformity with the findings of [Kumar et al. \(2013\)](#). The variation might be due to the inherent character of varieties under similar environmental condition. The similar findings were also reported by [Naik et al. \(2006\)](#).

Result recorded that maximum leaf length was found 49.68 cm, 47.9 cm and 45.9 cm with Rosalin, Silvester and Stanza respectively and these three cultivars were at par with each other. Whereas, leaf breadth was recorded highest under stanza (19.76 cm) followed by Silvester (14.52 cm). The Marked variation in leaf length and breadth might be due to differential character of individual cultivars that expressed their genetic characteristics. These results were in conformity with findings of [Kumar et al. \(2013\)](#).

Plant spread was recorded maximum in Rosalin (57.82 cm) followed by Stanza (57.7 cm) and lowest was recorded with Brilliance (52.8 cm). These difference among the cultivars might be due to bigger size leaves produced by respective cultivars. The result was in accordance with the findings of [Singh and Ramchandran \(2002\)](#).

Maximum number of suckers / plant was produced with Silvester (2.2 nos.) while minimum with Rosalin (1.4 nos) variety. Silvester produced higher number of leaves / plant with higher number of suckers /plant as compared to other cultivars indicating a positive correlation between number of leaves and suckers as report by [Deka and Talukdar \(2015\)](#).

Flowering quality characters

Data on different parameters of flowering quality characters are presented in [Table 3](#) and individual parameters are discussed.

Peduncle length and peduncle diameter

Peduncle length is a very important factor for gerbera cut flower. It decides the quality of cut flower. As more peduncle length will reserve more and get stored in the peduncle, which will later be available to the flower for longer time period. Significant difference was observed in both peduncle length and diameter of different cultivar of Gerbera ([Table 3 and Fig. 1](#)). Maximum peduncle length was reported with Brilliance (70.96 cm) followed by Rosalin (70.1 cm) while minimum was

recorded in Stanza (58.62 cm) cultivar. Similar result was reported by [Kallol and Biradar \(2016\)](#). Peduncle diameter had greatest positive direct effect on cut flower yield. Maximum

peduncle diameter was found with Rosalin (0.80 cm) cultivar followed by Stanza (0.76 cm) than other cultivars. This finding is in concordance with the [Kallol and Biradar \(2016\)](#).

Table 3: Evaluation of Gerbera genotypes for flowering characters under naturally ventilated poly house

Cultivars	Flower diameter (cm)	Diameter of trans floret (cm)	Diameter of disc floret (cm)	Peduncle diameter (cm)	Width of ray floret (cm)	Length of ray floret (cm)	No. of flower/plant
Stanza	10.86	5.64	2.62	0.76	1.02	4.56	7.12
Silvester	8.98	4.18	2.18	0.6	0.9	4.56	8.4
Rosalin	12.04	7.52	3.4	0.8	1.12	5.44	6.6
Brilliance	8.36	3.82	2.4	0.68	1.08	4.24	6.6
SEm (\pm)	0.32	0.27	0.17	0.03	0.29	0.11	0.60
CD(P=0.05)	0.46	0.8	0.5	0.10	NS	0.3	NS

Flower diameter, Diameter of transfloret and disc floret

Maximum flower diameter was significantly recorded in Rosalin (12.04 cm) followed by Stanza (10.86 cm), Silvester (8.96 cm) and minimum with Brilliance (8.36 cm). Data on flower diameter was recorded under Silvester and Brilliance was found at par with each other. Gerbera cultivars varied significantly among the cultivars were also reported by [Ahlawat *et al.* \(2012\)](#). Bigger diameter of Rosalin might be due to the inherent character of individual cultivars and this finding was in accordance with the result of [Singh *et al.* \(2017\)](#). Significant different was observed in diameter of transfloret and disc floret with the different cultivar of gerbera. Cultivar Rosalin recorded maximum diameter of transfloret (7.53 cm) and diameter of disc floret (3.4 cm) as compared to other cultivars. Similar kind of result was reported by [Megokhono and Alila \(2008\)](#).

Number of ray floret, Length of ray floret and width of ray floret

Number of ray floret varied significantly among the cultivars. Maximum number of ray floret was found in Stanza (73.4 nos.) followed by Brilliance (58.6 nos.) as compared to other cultivars. Number of ray floret recorded with Brilliance, Rosalin and Silvester were found at par with each other ([Table 3](#) and [Fig. 1](#)). Rosalin cultivar produced maximum length and width of ray floret which were recorded 5.44 cm and 1.12 cm respectively as compared to other gerbera cultivar. Variation of number, length and width of ray floret of varieties may be due to inherent genetics of the different varieties. The findings of the present study are in accordance with [Thirugnanavel *et al.* \(2019\)](#).

Number of flower/plant

Maximum number of flower/plant ([Table 3](#)) was recorded (8.4 nos.) in Silvester followed by Stanza (7.2 nos.) while the minimum was under Rosalin and Brilliance (6.6 nos.). The increase in flower number may be attributed by more number of leaves per plant and number of suckers /plant in cultivars Silvester, which might have resulted in production and accumulation of maximum photosynthesis; this was in accordance to the findings of [Barooh and Talukdar \(2009\)](#).

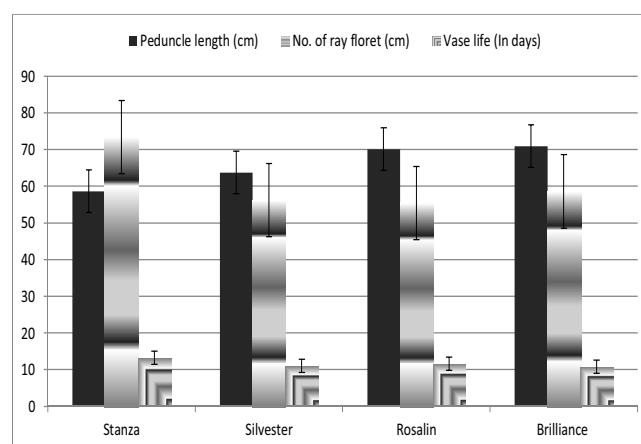


Fig. 1: Peduncle length, nos. of ray floret and vase life of Gerbera cultivars under naturally ventilated poly house

Vase life flower

Shelf life of cut flower is an important trait which decides its longevity in vase as well as in decorations and also influence on local market and international trades. Generally flower with longest vase life are preferred. There was significant difference on vase life among the cultivars of gerbera ([Fig 1](#)). Maximum vase life was recorded in Stanza (13.2 days) followed by Rosalin (11.6 days), Silvester (11 days) and minimum with Brilliance (10.8 days) cultivar. Variation in vase life among cultivars may be attributed due to variation in their genetical makeup. The varieties which exhibit longer vase life might possess better water uptake capacity and higher accumulation of metabolic sugar (reducing and non-reducing) in the plant as well as in flower peduncle. The results are in accordance to the finding of [Wankhede and Gajbiye \(2013\)](#), [Dekaand Talukdar \(2015\)](#) and [Kumar *et al.* \(2013\)](#).

CONCLUSION

From the above results obtained from the experiment conducted at Longleng Nagaland, it may be conclude that under Nagaland condition, Rosalin and Stanza gerbera cultivars, appears to be the best as compared to Silvester and Brilliance cultivar not only in terms of vegetative parameters, but also in case of flowering and quality attributes.

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