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Short communication

Evaluation of gerbera cultivars under naturally ventilated polyhouse

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ABSTRACT

A study was undertake to evaluate ten gerbera cultivars under naturally ventilated polyhouse. The plants were grown on raised bed at 45 cm × 30 cm. Maximum plant height (25.04 cm) was registered for cv. Dalma, Pink Elegance had higher spread (47.66 cm). Cv. Sunway gave earliest flowering, while Savannal (59.46 cm) gave maximum stake length. Flower yield was maximum (396 per sq. m/y) in Winter Queen, while Avant Garde had longest vase-life (11.8 days).

Keywords: Gerbera, evaluation, polyhouse, cultivars.

Gerbera (*Gerbera jamesonii* Bolus ex. Hooker F.) is an important cut flower, ideal for both export and domestic purposes. There is a great demand for gerbera particularly in European markets during the winter season and almost through out the year in India. Performance of gerbera cultivars varies with the region, season and growing conditions (Horn *et al.*, 3). To meet the quality standards, gerbera should preferably be grown under protected conditions. There is a need to evaluate new cultivars for their quantitative and qualitative parameters when grown under polyhouses or greenhouses. There is also a dearth of information regarding the effect of protected cultivation on the yield and quality of gerbera. Therefore, the present trial was carried out to study the performance of gerbera cultivars under naturally ventilated polyhouse in the Saurashtra region of Gujarat with respect to growth, quality and yield of flowers.

The experiment was undertaken at the Hi-Tech Horticulture Park, College of Agriculture, Junagadh Agricultural University, Junagadh and evaluated in a Completely Randomized Design with three replications and eleven treatments (variety as treatment) under naturally ventilated polyhouse conditions. The naturally ventilated polyhouse was constructed using galvanized iron pipes along with insect proof nets on all sides. An internal shade net was employed to reduce light intensity during the summer season. As and when needed, fogging was used to regulate the temperature and humidity inside the polyhouse. Eight-week-old tissue cultured plantlets of eleven gerbera varieties, *viz.*, Salvadore (V_1), Sunway (V_2), Doni (V_3), Essence (V_4), Dana Allen (V_5), Savannah (V_6), Winter Queen (V_7), Avant Garde (V_8), Dalma (V_9), Pink Elegance (V_{10}), and Rosalin (V_{11}) were procured from M/s KF Bioplants, Pune. The plantlets were grown in raised beds at a spacing of 45 cm × 30 cm. Cultural practices such as fertigation and plant protection were carried out as per standard recommendations and kept common for all treatments. Observations were recorded on plant height (cm), plant spread (cm), days to flower opening, stalk length (cm), stalk thickness (mm), flower diameter (cm), fresh weight of flower (g), flower yield (number/m^2/year) and vase-life (days) up to 12 months. The mean data on various biometrical parameters recorded during the period of study were subjected to statistical analysis.

It is evident from Table 1 that the varieties under evaluation differed significantly for plant height and plant spread. The maximum plant height (25.04 cm) was recorded in Dalma and it was statistically at par with Dana Allen (21.93 cm). While, Sunway registered minimum plant height (17.33 cm). Pink Elegance exhibited the maximum plant spread [N-S (47.66 cm) and E-W (48.13 cm)]. The minimum spread [N-S (38.33 cm) and E-W (39.66 cm)] was observed in Salvadore. This variation in growth parameters may be due to varietal characters. Such variation in the growth parameters was earlier reported in gerbera cultivars by Dhane *et al*. (2), and Sema Akali *et al.* (8).

Flowering traits such as days to flower opening, stalk length, stalk thickness, flower diameter and flower weight differed significantly among the varieties (Table 1). Sunway was the earliest (56.00 days) in flowering, while Savannah required the maximum number of days (72.27). Similar variations in days to flowering were reported by Nair and Medhi (7). Stalk length and thickness are of vital importance to gerbera as they govern the quality of cut flowers. The longest flower stalk was observed in Savannah (59.46 cm) and was statistically at par with Rosalin (55.10 cm). Whereas, the shortest stalk length was seen in

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Table 1. Performance of gerbera cultivars under a naturally ventilated polyhouse for various growth parameters, flowering traits and flower yield.

Variety	Growth parameters			Flowering traits					Flower yield (number /m^2/ year)	Vase-life (days)
	Plant height (cm)	Plant spread (cm)		Days to flower opening	Stalk length (cm)	Stalk thickness (mm)	Flower diameter (cm)	Fresh weight of flower (g)		
		N-S	E-W							
V_1-Salvadore	21.00	38.33	39.66	66.26	53.50	5.69	9.62	60.00	228.00	08.0
V_2-Sunway	17.33	43.80	43.20	56.00	47.83	6.39	10.27	66.26	204.00	07.2
V_3-Doni	16.86	38.20	41.13	66.20	49.86	6.50	11.00	66.20	168.00	11.0
V_4-Essence	17.86	39.66	42.39	66.93	42.50	6.26	10.06	66.93	132.00	11.4
V_5-Dana Allen	21.93	47.66	46.20	69.87	52.60	6.06	9.36	70.87	132.00	10.0
V_6-Savannah	20.80	40.66	42.60	72.27	59.46	6.38	10.72	70.07	288.00	08.6
V_7-Winter Queen	18.93	44.40	45.26	68.00	49.73	6.20	10.18	68.00	396.00	11.7
V_8-Avant Garde	19.00	45.86	47.66	65.06	49.36	5.29	10.37	65.06	132.00	11.8
V9-Dalma	25.04	46.33	46.73	67.66	53.10	5.44	9.97	67.66	324.00	10.4
V_{10}-Pink Elegance	18.33	47.66	48.13	70.33	49.93	5.82	10.43	69.50	276.00	09.2
V_{11}-Rosalin	20.00	43.46	43.47	69.59	55.10	5.24	10.26	68.26	204.00	09.6
CD at 5%	3.79	5.62	5.11	8.08	5.48	0.55	0.88	5.71	24.35	0.97
CV (%)	11.33	7.66	6.83	7.11	6.32	5.43	5.09	5.02	6.37	5.78

Essence (42.50 cm). These results are in accordance with the findings of Kandpal *et al.* (4) who also reported a variation in stalk length among genotypes due to the genetic characters of a particular genotype.

The thickest flower stalk (6.50 mm) was produced in Doni followed by Sunway (6.39 mm), Savannah (6.38 mm), Essence (6.26 mm), Winter Queen (6.20 mm) and Dana Allen (6.06 mm) and they were statistically at par with each other. While, Rosalin recorded the thinnest flower stalk (5.24 mm). Flower diameter varied from 9.36 cm in Dana Allen to 11.00 cm in Doni. The increase in flower size may be due to bigger ray florets observed in the concerned cultivars. The above results are in conformity with the findings of Singh and Ramchandran (9) in gerbera. Dana Allan registered the heaviest fresh flower (70.87 g) closely followed by Savannah (70.07 g) and Pink Elegance (69.50 g). The lightest fresh flower (60.00 g) was observed in Salvadore.

Significant variation was observed amongst the varieties for number of flowers produced per square metre per year and their vase-life. Winter Queen produced the maximum number of flowers (396) followed by Dalma (324), and Savannah (288). The minimum number of flowers per square metre per year (132) was noticed in Essence, Dana Allen and Avant Garde. This increase in flower yield can be attributed to greater plant spread which would have resulted in production and accumulation of more photosynthates, thereby leading to the production of more number of flowers. This is in line with the findings of Ambad *et al.* (1), and Naik *et al.* (6) in gerbera. The data on flower yield leads us to conclude that the variety Winter Queen was the most profuse flowering variety among the different varieties selected for the study.

Avant Garde had the maximum vase-life (11.8 days) and was statistically at par with Winter Queen (11.7 days), Essence (11.4 days) and Doni (11.00 days). The minimum vase-life was observed in Sunway (7.2 days). These results are similar to those of Mishra (5) in chrysanthemum who observed a variation in vase-life among chrysanthemum cultivars grown in a polyhouse. He attributed this to greater fresh weight of flowers, absence of dew fall in the polyhouse and greater carbon dioxide concentration inside the polyhouse. Similar results were obtained by Singh and Srivastava (10) in the varietal evaluation of eight gerbera cultivars grown in a low cost polyhouse.

Amongst the eleven gerbera cultivars tested under naturally ventilated polyhouse conditions, varieties Doni, Savannah and Pink Elegance with large flower diameter are ideal as cut flowers. Savannah and Rosalin with longer stalk length can be used as cut flowers in bouquets and for exhibition purpose. Based on growth parameters, flowering traits and flower production, Doni, Dalma, Savannah and

Winter Queen can be regarded as superior over the rest of the varieties These varieties are therefore recommended for commercial cultivation under naturally ventilated polyhouses in Saurashtra region of Gujarat. Outstanding characters of the identified cultivars can also be exploited in the improvement programme for evolving superior quality gerbera hybrids.

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