



Performance of rose cultivars under naturally ventilated polyhouse in hillzone

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Abstract: An investigation on performance of rose cultivars under naturally ventilated polyhouse (NVPH) in hill zone of Karnataka was carried out in College of Horticulture, Mudigere, Karnataka during 2014-15. The ten rose cultivars viz., Grand Gala, Noblesse, Corvetti, First Red, Gold Strike, Shakira, Arka Swadesh, Konfetti, Tineke and Tajmahal were used for the study. Among the cultivars studied, Grand Gala recorded maximum plant height (97.43 cm). The cv. Konfetti recorded maximum number of leaves per shoot (11.37). The Cv. Tajmahal recorded maximum number of leaves per plant and leaf area per plant (54.67 and 1272.23 cm², respectively). The Cv. Shakira (3.70) had maximum number of shoots per plant. In case of flower quality and yield attributes, highest stalk length (66.75 cm), stalk girth (0.96 cm) and flower bud diameter (3.91 cm) was recorded in the cv. Grand Gala. The Cv. Tineke recorded maximum flower diameter and number of petals per flower (8.68 cm and 37.37, respectively). The Cv. Tajmahal was found to be high yielder with respect to number of flowers per plant (3.58) and flowers per square meter (39.41).

Keywords: Rose, cultivars, NVPH and Performance

Introduction

Rosa hybrida L. is one of the nature's beautiful creations and is universally acclaimed as "Queen of Flowers" belongs to the family Rosaceae, it is native to temperate regions of northern hemisphere. No other flower is a better symbol of love, adoration, innocence, peace, friendship, affection, passion and other virtues than the rose since thousands of years. Rose ranks first among the top ten cut flowers in the international flower market. It is grown for various purposes, such as garden flowers, for aesthetic value, cut flowers for decoration and loose flowers for garland and also for making various products such as rose oil, rose water, gulkhand, rose attar, etc. Rose is not commercially cultivated in hillzone of Karnataka. Crop diversification in hilly region is need of an hour and protected cultivation plays an important role and rose is highly suitable to harvest high quality flowers. Lack of awareness among the farmers about the cultivation of rose, the performance of any crop depends on the cultivars apart from environment. Hence, it is proposed to identify suitable cultivars and create awareness among the farmers for commercial cultivation of rose. Therefore, a investigation was carried out with a view to study the performance of rose cultivars under NVPH.

Materials and Methods

The present investigation was carried out at the experimental block of the Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere which is situated in hill zone of Karnataka at 13° 7' North latitude, 75° 37' East longitude with an altitude of 982 m above mean sea level. It receives an annual mean rainfall of 2350 mm. Ten rose cultivars viz., Grand Gala, Noblesse, Corvetti, First Red, Gold Strike, Shakira, Arka Swadesh, Konfetti, Tineke and Tajmahal were selected to study under naturally ventilated polyhouse. This experiment was carried by following randomized complete block design (RCBD). The treatments comprised of ten varieties and replicated thrice. The experiment was laid out in a naturally ventilated polyhouse. Its frame is made up

of galvanized iron pipe and covered with 800 gauge UV stabilized polyethylene film. The shade net with 50 per cent shade was provided above the headspace inside the polyhouse to manage the light intensity and temperature during summer. Both sides are covered with 50 mesh size plastic net for natural ventilation. All the varieties were planted on May 2014. Planting was done at the spacing of 30 cm x 30 cm. The observations on vegetative parameters such as plant height, number of shoot per plant, number of leaves per shoot, number of leaves per plant and leaf area, flowering and yield parameters such as stalk length, stalk girth, bud diameter, flower diameter, number of petal per flower and number of flowers per plant have been recorded at different stages of the plant growth.

Results and Discussion

Vegetative parameters: The data pertaining to the vegetative parameters at different stages of crop growth are presented in table 1. The performance of ten cultivars indicated significant variations at all stages of crop growth. The plant height was significantly influenced by different cultivars. The cultivar Grand Gala recorded highest plant height of 97.43 cm followed by Corvetti (90.30 cm) and while the cv. Arka Swadesh was recorded lowest plant height of 83.70 cm. The mean number of leaves per shoot was significantly differed among the cultivars. The Cultivar Konfetti (11.37) followed Tajmahal (11.03) had highest number of leaves per shoot, which were superior over all other cultivars and on par with each other. While, the cultivar Tineke (8.47) recorded least number of leaves per shoot. The mean number of leaves per plant were significantly differed among the cultivars. The cultivar Tajmahal (54.67) produced maximum number of leaves per plant followed by Shakira (50.67) and Arka Swadesh (47.33). While, the cultivar Gold Strike (41.00) recorded minimum number of leaves per plant. The leaf area per plant differed significantly among the cultivars tried. The cultivar Tajmahal had highest leaf area per plant (1272.23 cm²), while the cultivar Gold Strike recorded minimum leaf area (969.03 cm²). The differences among the cultivars

Table-1: Vegetative parameters of rose cultivars under Naturally Ventilated Polyhouse (NVPH)

Cultivar	Plant height (cm)	No. of leaves /shoot	No. of leaves /plant	No. of shoots /plant	Leaf area /plant (cm ²)
Grand Gala	97.43	10.03	41.33	3.20	987.70
Noblesse	84.44	9.83	42.67	3.30	992.23
Corvetti	90.30	10.20	44.67	3.23	976.33
First Red	87.03	9.43	42.00	2.97	989.30
Gold Strike	85.05	9.67	41.00	3.13	969.03
Shakira	86.23	9.90	50.67	3.70	991.13
Arka Swadesh	83.70	10.10	47.33	3.10	987.53
Konfetti	84.50	11.37	47.00	3.23	1266.57
Tineke	86.40	8.47	44.67	3.53	974.57
Tajmahal	88.23	11.03	54.67	3.47	1272.23
S. Em±	1.26	0.21	1.12	0.13	16.99
CD at 5%	3.73	0.64	3.32	0.39	50.47

Table-2: Flowering parameters of rose cultivars under Naturally Ventilated Polyhouse (NVPH)

Cultivar	Flower stalk length (cm)	Flower stalk girth (cm)	Flower bud length (cm)	Flower bud diameter (cm)	Flower diameter (cm)	No. of petals per flower
Grand Gala	66.75	0.96	4.43	3.91	7.19	24.46
Noblesse	50.91	0.64	4.48	3.18	6.60	21.44
Corvetti	54.77	0.58	4.31	3.35	6.70	20.93
First Red	54.26	0.73	4.70	3.28	7.28	26.58
Gold Strike	48.05	0.67	3.71	3.00	6.83	22.53
Shakira	57.72	0.77	4.42	2.88	7.00	24.96
Arka Swadesh	55.32	0.75	3.45	3.05	7.16	21.73
Konfetti	54.52	0.68	4.77	3.28	7.37	20.78
Tineke	51.32	0.76	3.89	3.70	8.68	37.37
Tajmahal	50.48	0.81	3.70	3.02	8.28	35.96
S. Em±	1.54	0.06	0.22	0.16	0.19	0.64
CD at 5%	4.58	0.19	0.65	0.46	0.56	1.91

Table-3: Yield parameters of rose cultivars under Naturally Ventilated Polyhouse (NVPH)

Cultivar	No. of flowers/plant	No. of flowers/square meter
Grand Gala	2.34	25.72
Noblesse	2.76	30.43
Corvetti	2.87	31.65
First Red	2.71	29.82
Gold Strike	2.95	32.51
Shakira	2.91	32.07
Arka Swadesh	2.75	30.24
Konfetti	3.01	33.12
Tineke	3.04	33.49
Tajmahal	3.58	39.41
S. Em±	0.13	1.48
CD at 5%	0.40	4.40

may be attributed to the inherent genetic character associated with the cultivars and growing condition. Similar variation was reported by Hussain and Khan (2004), Mantur *et al.* (2005), Prashant (2010) and Mohanty *et al.* (2011) in rose. The mean number of shoots per plant were significantly differed among the cultivars. The cultivar Shakira (3.70) had maximum number of shoots per plant followed by Tineke (3.53), which were superior over all other cultivars and on par with each other. The cultivar First Red (2.97) recorded minimum number of shoots per plant, this might be due to variation in genetic constitution

and also might be due to less response these cultivars to bending. These results are in conformation with the findings of Adnan and Atif (2005) and Qasim *et al.* (2008) in rose cultivars.

Flowering parameters: The data pertaining to flowering parameters at different stages of crop growth are furnished in table-2. Flower quality characters were significantly influenced by cultivars. The cultivar Grand Gala was appreciated for flower quality by recording highest stalk length (66.75 cm), stalk girth (0.96 cm) and flower bud diameter (3.91 cm). The cultivar Konfetti was found highest flower bud length (4.77 cm), while minimum was recorded in Arka Swadesh (3.45 cm). The cultivar Tineke recorded maximum flower diameter and number of petals per flower (8.68 cm and 37.37, respectively) followed by Cv. Tajmahal (8.28 cm and 35.96, respectively). However, the cultivars Gold Strike, Corvetti, Arka Swadesh, Shakira, Noblesse and Konfetti were recorded minimum stalk length (48.05 cm), stalk girth (0.58 cm), flower bud length (3.45 cm), flower bud diameter (2.88 cm), flower diameter (6.60 cm) and number of petals per flower (20.78), respectively. It may be due to accumulation of more dry matter in sink due to enhanced vegetative growth and also genetic makeup of the cultivar. Similar kinds of results were also reported by Manjula (2005), Man Bihari *et al.* (2009), Prashant (2010) and Mohanty *et al.* (2011) in rose.

Yield parameters: The data pertaining to flowering parameters at different stages of crop growth are furnished in table-2. The Cv. Tajmahal was found to be high yielder with respect to number of flowers per plant per (3.58) and flowers per square meter (39.41). While, Cv. Grand Gala was produced least number of flowers per plant (2.34) and per square meter (25.72). In the present study, higher yield might be due to increased morphological parameters like plant height, number of shoots, number of leaves, leaf area and chlorophyll which helps in production of more photosynthates resulting in greater accumulation of dry matter which intern leads to production of more number of flowers per plant. Variation among the cultivars with respect to marketable quality flowers has been reported previously by Sindhu and Rameshkumar (2004), Mantur *et al.* (2005) and Prashant (2010) in rose.

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