Original Research Article

Varietal Evaluation of Scented Field Roses under Coimbatore Agro Climatic Conditions

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ABSTRACT

A field experiment to evaluate the performance of ten scented field roses in terms of growth and floral parameters under open field condition was carried out at Botanical Garden, Department of Floriculture and Landscape Architecture, Tamil Nadu Agricultural University Coimbatore during the year 2022. Since there is a major lacuna in variety of scented field roses for cultivation in farmer's field, the present study was undertaken to assess suitable variety for commercial cultivation under Coimbatore condition. The field experiment was carried out using Randomized Block Design (RBD) with ten treatments (Arka Sukanya, Arka Parimala, Bourbon rose type 1, Bourbon Rose type 2, Pusa Alpana, Rose Sherbet, Scent Pink, Damask rose type 1, Damask rose type 2, Andhra Red) and three replications. Results indicate a significance difference between the varieties for growth, flowering and yield characters. Experimental data revealed that the maximum plant height (68.92 cm), maximum number of shoots per plant (8.21), maximum leaves per plant (410.50), stem girth (6.28 cm), Highest chlorophyll content (58.1), Least number days for flower bud initiation (31.05), Diameter of fully opened flower (5.89 cm) and fresh flower weight (3.59 g) was seen in Bourbon rose type 1. Bourbon rose type 2 recorded maximum number of flowers per plant (41.12) and Andhra red rose recorded maximum number of petals per flower (94.89) among the evaluated varieties.

Keywords: Scented field roses; Evaluation; vegetative parameter; floral parameters.

1. INTRODUCTION

Rose is one of the oldest flowers under cultivation and most popular of all garden flowers throughout the world and it is universally known as "Queen of Flowers". Rose occupies first position in international flower trade Gajraj *et al.,* (2022) [1]. The word Rose is derived from the word Eros which comes from Greek god for love. It represents love, companionship, sincerity, romance, grace and spirituality (Hummer and Jenick, 2009) [2]. The genus *Rosa* has been derived from Greek word Rhedon which denotes its fragrant flowers. It constitutes 120 species and more than 30,000 cultivars that are widely distributed in the temperate and subtropical parts of the northern and southern hemispheres.Only few species of *Rosa* sp are scented viz., *Rosa damascena*., *R. gallica*, *R.centifolia*, *R. moschata*, *R. bourboniana*, *R. chinensis* etc. The fragrance can range from subtle and sweet to rich and intense depending on the varietal character of the flower. Apart from being aesthetically pleasing, roses have various medicinal properties. Rose essential oil, which is derived from scented roses is frequently used in aromatherapy which is believed to promote relaxation, reduce stress, and uplift moods. In traditional market places, rose flowers without the stalk and loose flower petals are used for making garlands and to make offerings in temples. As commercial cultivation of roses is gaining importance day by day, there is need for identification of high-yielding scented rose cultivars. Therefore, the present study was undertaken to evaluate the scented field rose varieties in open field conditions to assist the farmers in increasing the productivity and consumers in receiving higher quality flowers.

2. MATERIAL AND METHODS

An experiment entitled “Varietal evaluation of scented field roses under Coimbatore agro climatic conditions” was carried out at Botanical Garden, Department of Floriculture and Landscape Architecture, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, India during the year 2022. The experiment was laid out in Randomized Block Design (RBD) with three replications and five plants per replication. The varieties that were subjected to evaluation are V_1 -Arka Sukanya, V_2 - Arka Parimala, V_3 - Bourbon rose type 1, V_4 - Bourbon Rose type 2, V_5 - Pusa Alpana, V_6 - Rose Sherbet, V_7 - Scent Pink, V_8 - Damask rose type 1, V_9 - Damask rose type 2, V_{10} - Andhra Red were planted at spacing of 1m x 1m. Five plants from each replication were selected and used for recording observations. Observations in respect of vegetative growth (Table.1) viz.,,plant height (cm), Number of shoots per plant, Number of leaves per plant, Stem girth (cm), Chlorophyll content (SPAD values) were recorded at 120 days after pruning and flowering parameters (Table.2) viz.,,Days to flower bud initiation (days), Diameter of fully opened flower (cm), No of petals per flower, Number of flowers per plant and weight of fresh flower (g) were also recorded. Collected data was subjected to statistical analysis by using AGRES software and Microsoft spreadsheet.

3. RESULTS AND DISCUSSION

3.1 Vegetative parameters

Plant height varied significantly among the varieties at 120 days after pruning (Table 1). The maximum plant height was observed in the variety Bourbon rose type 1 (68.92 cm) closely followed by Bourbon rose type 2 (67.40 cm). Minimum plant height was recorded in the variety Pusa Alpana (33.3 cm) (Table1). Differences in plant height is dependent on the varietal character of the plants and it varies from one variety to the other (Kanamadi and Patil, 1993 [3] and Behera *et al.* 2002[4]). More number of leaves may have contributed to the increased photosynthesis rate resulting in increased plant height. Comparable differences in plant height in rose were also recorded by Mohanty *et al.,* (2011) [5], Ramzan *et al.,* (2014) [6], Amita *et al.,* (2021) [7], Muthulakshmi *et al.,* (2022) [8].

Number of shoots per plant was highest in var Bourbon rose type 1 (8.21) and was significantly superior compared to other varieties. Minimum number of shoots per plant was observed in Pusa Alpana (3.20) (Table 1). Due to the influence of genetic makeup of the different varieties, variation in shoots may be observed. Similar observations were recorded in rose by Tabassum *et al.,* (2002) [9], Ramzan *et al.,* (2014) [6], Muthulakshmi *et al.,* (2022) [8].

Among the evaluated scented field roses, highest number of leaves per plant was observed in the var Bourbon rose type 1 (410.50) followed by Bourbon rose type 2 (326.48) and Andhra red (279.20), whereas minimum number of leaves per plant was observed in the var Pusa Alpana (60.08) (Table 1). This might be due to the inherent genetic factors, higher sprouting of auxiliary buds, endogenous production of cytokinin, auxin and gibberllins. The current findings are consistent with that of Wasnik *et al*., (2015) [10] Ashwini *et al.,* (2021) [11], Abd-Elrahim and Osman (2017) [12] Muthulakshmi *et al.,* (2022) [8].

Maximum stem girth was recorded in the variety Bourbon rose type 1 (6.28), followed closely by Bourbon rose type 2 (5.99) and Andhra Red (5.82). Minimum stem girth was recorded in the variety Arka Sukanya (1.91) (Table 1). Variations in stem girth is often due to varietal character of the plant. The results are in close agreement with the findings of Soujanya *et al.,* (2018) [13], Muthulakshmi *et al.,* (2022) [8].

The maximum chlorophyll content (SPAD value) was recorded in the variety Bourbon rose type 1 (58.10) followed by Bourbon rose type 2 (55.40) and scent pink (54.29). However minimum value was recorded in variety Pusa Alpana (37.56) (Table 1, Fig.1). Leaves are the functioning units for photosynthesis particularly the chlorophyll content of leaf influences the growth of the plant. The leaf chlorophyll content is a genetic character that differs according to varieties. Variation in chlorophyll content was also observed previously in orchids by Anita *et al.* (2000) [14] and Prabhu *et al.,* (2018) [15] in chrysanthemum and in rose by Soujanya *et al.,* (2018) [13].

3.2 Floral parameters

Earliest bud initiation was seen in the variety Bourbon Rose type 1 (31.05) followed by Andhra red (32.15) and Scent Pink (32.98) whereas Pusa Alpana took the longest time for bud initiation (49.70) (Table 2). If a plant has adequate carbohydrates in it since its vegetative growth, it has a tendency to enter the reproductive phase early. Initiation of flower buds is also influenced by environmental conditions. These observations are in agreement with Kute *et al.,* (2022) [16] and Patil *et al*., (2022) [17].

Among the different varieties assessed, maximum diameter of fully opened flower was recorded in the variety Bourbon rose type 1 (5.89) followed by Bourbon rose type 2 (5.69) and minimum diameter of fully opened flower was recorded in

the variety Pusa Alpana (3.92) (Table 2). The variation can be attributed to genetic makeup of the variety and impact of biotic and abiotic factors as well. These outcomes are in accordance with Wasnik *et al.,* (2015) [10], Ashwini *et al.,* (2021) [11] and Muthulakshmi *et al.,* (2022) [8].

Number of flowers per plant was measured in the collected varieties and the highest number of flowers was observed in Bourbon rose type (41.12) by Bourbon rose type 1 (39.84) whereas least number of flowers per plant was observed in Pusa Alpana (12.38) (Table 2, Fig. 2). Maximum number of flowers per plant might be attributed to more number of leaves per plant and chlorophyll content which would result in production and accumulation of more photosynthesis resulting in the production of more number of flowers with bigger size. The observed results are in agreement with previous reports of Mohanty *et al.,* (2011) [18], Singh *et al.,* (2013) [19], Ramzan *et al.,* (2014), Wasnik *et al.,* (2015) [10], Soujanya *et al.,* (2018) [13] and Amita *et al.,* (2021) [7], Muthulakshmi *et al.* (2022) [8].

Significantly maximum weight of fresh flower was recorded in the variety Bourbon rose type 1 (3.59) followed by Bourbon rose type 2 (3.41) and minimum weight of fresh flower was recorded in the variety Pusa Alpana (1.54) (Table 2). Variation in flower weight among the cultivars is a varietal character and depends upon the genetic makeup of the plant. These results are in favor with previous findings of Wasnik *et al.,* (2015) [10] and Amita *et al.,* (2021) [7].

More number of petals per flower was observed in the variety Andhra red (94.89) followed by Bourbon rose type 2 (89.03) and lowest number of petals per flower was observed in Arka Sukanya (28.5) (Table 2). The genetic makeup of the variety affects the diversity in the number of petals. Similar findings were also observed by Wasnik *et al.,* (2015) [10], Shahrin *et al.,* (2015) [20], and Muthulakshmi *et al.,* (2022) [8].

Table 1. Mean performance of the scented field roses for vegetative parameters

Varieties	Plant height (cm)	Number of shoots per plant	Number of leaves per plant	Stem girth (cm)	Chlorophyll content (SPAD values)
Arka Sukanya	51.46	4.45	115.7	4.11	43.71
Arka Parimala	54.29	4.89	141.81	5.67	46.80
Bourbon Rose type 1	68.92	8.21	410.5	6.28	58.10
Bourbon Rose type 2	67.40	7.42	326.48	5.99	55.40
Pusa Alpana	33.30	3.20	60.08	1.91	37.56
Rose Sherbet	59.79	4.20	121.8	3.77	48.80
Scent Pink	63.40	5.93	249.06	2.86	54.29
Damask rose type 1	41.73	4.12	86.52	2.91	42.70
Damask rose type 2	49.94	4.40	101.2	3.94	45.60
Andhra Red	61.70	6.98	279.2	5.82	51.40
Mean	55.19	4.53	187.38	55.19	48.4360
S.Ed	0.98	1.26	4.72	0.98	0.83
CD (5%)	2.07	2.66	9.93	2.07	1.75

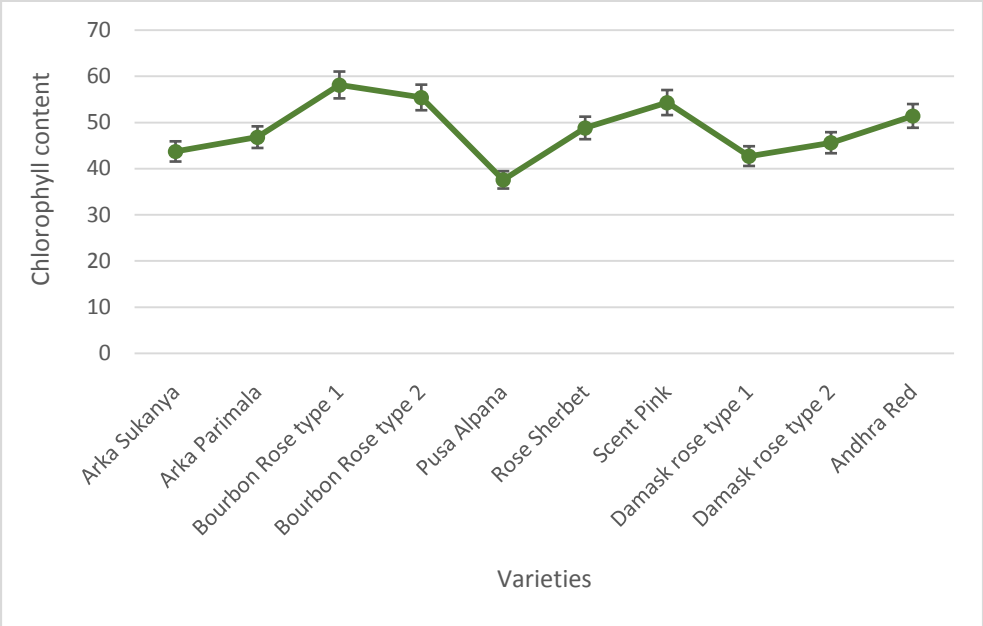

Fig.1. Chlorophyll content (SPAD values) of evaluated scented field roses

Table 2. Mean performance of the scented field roses for floral parameters

Varieties	Days to flower bud initiation (days)	Diameter of fully opened flower (cm)	No of petals per flower	No of flowers per plant	Fresh flower weight (g)
Arka Sukanya	43.73	5.12	28.50	19.51	2.32
Arka Parimala	42.32	5.52	35.70	21.71	2.86
Bourbon Rose type 1	31.05	5.89	88.71	39.84	3.59
Bourbon Rose type 2	37.29	5.69	89.03	41.12	3.41
Pusa Alpana	49.70	3.92	31.42	12.38	1.54
Rose Sherbet	38.00	4.87	44.20	28.16	2.43
Scent Pink	32.98	5.17	47.21	34.32	3.29
Damask rose type 1	47.80	4.59	52.17	13.67	1.97
Damask rose type 2	45.50	4.69	55.14	15.42	2.08
Andhra Red	32.15	4.93	94.89	32.71	3.11
Mean	40.05	3.97	25.88	25.88	2.66
S.Ed	0.67	0.08	7.13	7.13	0.04
CD (5%)	1.41	0.18	14.98	14.98	0.10

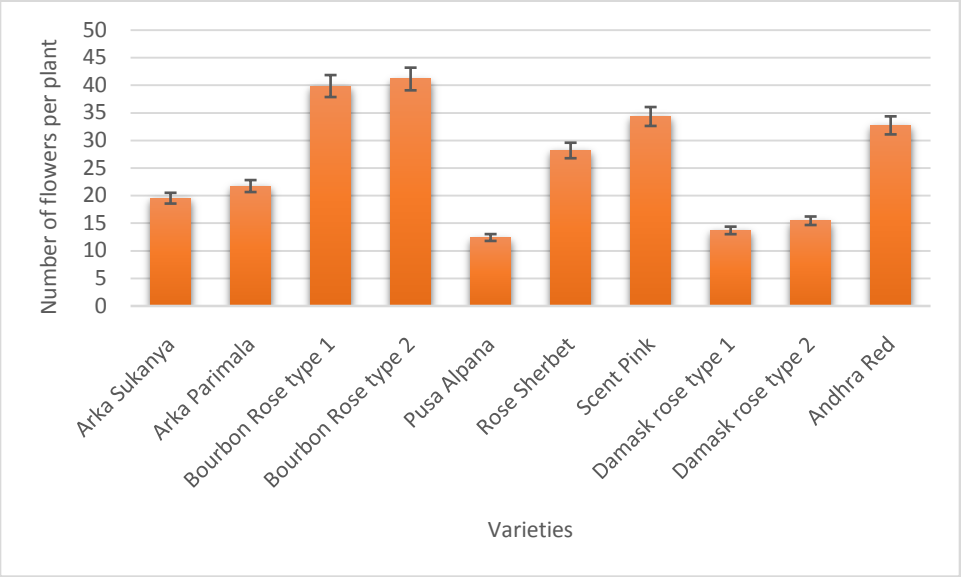

Fig.2. Number of flowers per plant for evaluated scented field roses

4. CONCLUSION

From the present experimental findings, it was observed that the variety Bourbon rose type 1 has outperformed all the other varieties in terms of vegetative and floral parameters in agroclimatic conditions of Coimbatore. It recorded maximum plant height, number of shoots per plant, number of leaves per plant, stem girth, highest chlorophyll content, diameter of fully opened flower, least number days for flower bud initiation, maximum fresh flower weight and estimated flower yield per plant. On the other hand, the variety Bourbon rose type 2 recorded maximum number of flowers per plant and Andhra red rose was reported to have maximum number of petals per flower. Bourbon rose type 1 and Bourbon rose type 2 exhibit vigorous growth and more yield however they require more maintenance. The varieties Arka Sukanya and Arka Parimala are performing well and they can be introduced to farmers for commercial cultivation in Coimbatore. Even though Damask rose type 1 and Damask rose type 2 exhibit less vigorous growth, they can be planted in high density plating which accommodates more number of plants which subsequently leads to more yield. Therefore these evaluated scented field rose varieties are suitable for cultivation under Coimbatore agro climatic conditions and they can be recommended for commercial cultivation in farmer's field and may be further utilized in breeding programs for further selection.

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