



Studies on Performance of Vegetative & Floral Parameters of Different Varieties under Polyhouse Condition

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The experiment was conducted in Randomized Block Design with ten cultivars and replicated thrice. The cultivars used in the experiment of Rose viz., Top Secret (T₁), Jumelia (T₂), Avalanche (T₃), Gold Strike (T₄), Revival (T₅), Naranga (T₆), Solaire (T₇), Hot Shot (T₈), Volcano (T₉) and Peach Avalanche (T₁₀). The maximum number of leaves per 10 cm middle shoot length (5.01), longest flower stalk length (59.50 cm) maximum stem girth (0.73 cm), was recorded significantly in Top Secret (T₁). Earliest first bud initiation (27.01 days) & earliest first harvest (32.37 days) were recorded in Revival (T₅) and maximum fresh weight of flower (43.95 g).

Keywords: *Bud initiation; bending; stem girth and stalk length.*

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1. INTRODUCTION

“Rose is the most popular economic flower crop and it is unique in its diversity in colour, types and fragrance. The performance of Dutch rose varieties varies with region to region, season, genotypes, and growing environment. In India, there is a diversified climatic condition, which not only affect the yield and quality it also limits their availability. Necessary for growing the Dutch rose in Polyhouse condition” [1].

“The main advantages of polyhouse cultivation are the crops can be cultivated successfully throughout the year, getting high productivity with excellent quality, more over it is easy to protect the crops against extreme climatic conditions and incidence of pests and disease, thus the genetic potentiality of the crops can be exploited to the maximum extent”. Ambad et.al. [2] the objective of this study was to evaluate the suitable varieties for quality and yield under the naturally ventilated polyhouse in Mahasamund district.

“It is a symbol of love, adoration and innocence and it occupies a prominent position in the tradition, religious and social culture of every country in the world. It has great demand in the internal as well as export markets”. [3] It is one of the nature's beautiful creations and is universally known as “Queen of Flower” and belongs to the family Rosaceae. With the basic chromosome number $n=7$ and cultivated rose with chromosome number $2n = 4x = 28$.

The total production of Dutch roses in India is approximately 0.03 thousand metric tones, which generated 141. 45 lakhs rupees of income. In India, major rose growing belts are Pune, Bangalore and Delhi. These are setup in and around Bangalore, Pune, Hyderabad and Delhi mainly of rose. So the expansion of the area is much felt need in the entire viable region to increase the production. In Chhattisgarh area under flower was 7130.4 ha and Mahasamund district and surrounding areas adjacent to Raipur and Durg have been identified as possibly the best region, suited for cut flower production

2. MATERIALS AND METHODS

The investigation to study the “Studies on performance of vegetative & floral parameters of different varieties under polyhouse condition” at village – Mohandi, District – Mahasamund and Department of Floriculture and Landscape Architecture, College of Agriculture, Indira

Gandhi Krishi Vishwavidyalaya, Krishak Nagar Raipur (C.G.), during the year 2021-2022 & 2022-23. “Five plants were selected at randomly and tagged in each treatment using Randomized Block Design (RBD) and replication for the purpose of recording observations on various flower quality parameters were taken during the study period, the first parameter was to assess the maximum number of shoot after bending, maximum number of leaves per 10 cm middle shoot, flower bud initiation, days were observed. Secondly, stem girth was measured by using vernier calliper in cm and fresh weight was recorded on weight machine Thirdly, the number of days taken to first harvest were determined by counting the total days, in five randomly selected flower” [3].

3. RESULTS AND DISCUSSION

3.1 Number of Leaves per 10 cm Middle Shoot Length

It was evident from the data presented in Table 1. and graphically illustrated in Fig. 1. that the maximum number of leaves per 10 cm middle shoot length was observed significantly maximum in Top Secret (T_1), i.e., (5.01) as compared to all other cultivars while, the minimum number of leaves per 10 cm middle shoot length (3.43) was noted in Peach Avalanche (T_{10}).

More number of leaves per 10 cm middle shoot length were produced in cultivars Top Secret, whereas, the less number of leaves per 10 cm middle shoot length were recorded in Peach Avalanche. Leaves are the functional units for photosynthesis, which greatly influence the growth and flower yield of many crops. Number of leaves produced per 10 cm shoot length varied significantly among rose cultivars studied. followed by Jumelia, Avalanche, Gold Strike and Revival. The production of more number of leaves in these cultivars was due to increased plant height. The cv. Peach Avalanche produced less number of leaves due to varietal difference. Similar variation was also reported by Shivaprasad [4], Suganthi et al. [1] and Muthulakshmi et al. [5].

3.2 Days Taken to First Flower Bud Initiation

The data showed on Table 1. and graphically illustrated in Fig. 1., that the maximum first flower bud initiation (34.39 days) in Top Secret (T_1)

significantly similar with Jumelia (T₂), Avalanche (T₃), Gold Strike (T₄). While, the minimum first flower bud initiation (27.01days) was noted in Revival (T₅). Significant difference was observed among the different cultivars of rose with respect to first flower bud initiation. Maximum first flower bud initiation was recorded in Top Secret and minimum in Revival.

The early flowering, blooming in Revival might be attributed to maximum number of leaves which would have resulted in production and accumulation of more photosynthesis and due to genetic makeup of variety. The data reveals that a significant variation existed in the number of days required for flower bud initiation among the

different cultivars under study. Manjula (2005) reported the similar results in rose present investigation. Mohantay et al. [6] and Shivaprasad [4].

3.3 Days Taken to First Harvest

The data showed that Table 1. and graphically illustrated in Fig. 1. Maximum first flower harvest (41.80 days) in Top Secret (T₁) that significantly similar with Jumelia (T₂), Avalanche (T₃), Gold Strike (T₄). While, the minimum first flower harvest (32.37 days) was noted in Revival (T₅). Significant difference was observed among the different cultivars of rose with respect to first flower harvest.

Table 1. Varietal evaluation of rose for quality and flower yield parameters

Tr. No	Varieties	Number of leaves per 10 cm middle shoot	first flower bud initiation (Days)	Days taken to first harvest	Flower stalk length (cm)	Stem girth (cm)	Fresh weight of flower (g)
T ₁	Top Secret	5.01	34.39	41.8	59.5	0.73	43.95
T ₂	Jumelia	4.75	33.21	40.77	57.75	0.69	41.91
T ₃	Avalanche	4.6	31.7	39.68	54.45	0.65	40.84
T ₄	Gold Strike	4.43	30.76	38.8	52.99	0.62	40.01
T ₅	Revival	4.09	27.01	32.37	52.07	0.61	38.76
T ₆	Naranga	3.93	30.73	37.84	51.25	0.58	36.96
T ₇	Solaire	3.72	31.24	36.35	49.91	0.56	35.78
T ₈	Hot Shot	3.66	29.98	35.29	48.81	0.54	34.62
T ₉	Volcano	3.6	29.77	33.7	47.49	0.51	33.54
T ₁₀	Peach Avalanche	3.43	28.93	32.74	46.6	0.49	31.87
SEm (±)		0.12	0.48	0.67	0.54	0.16	0.91
C.D. at 5%		0.38	1.44	1.99	1.61	0.47	2.70

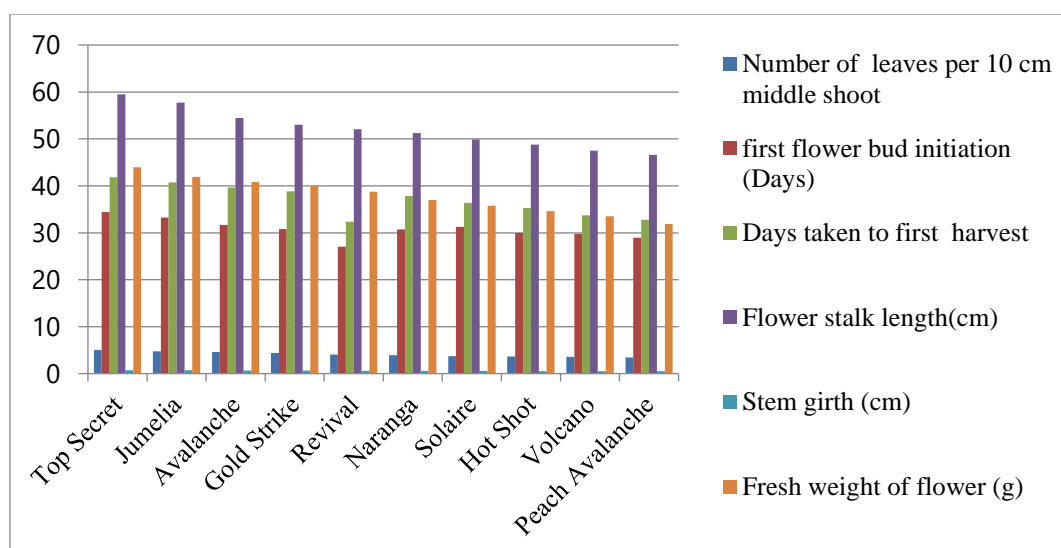


Fig. 1. Varietal evaluation of rose for quality and flower yield parameters

Revival recorded earliest first flower harvest while, Top Secret recorded delayed first flower harvest. The variations of first flower harvest was primarily due to different genetic constitution of various cultivars and prevailing environmental conditions during the period of crop growth. Similar variation was also reported by Shivaprasad [4].

3.4 Flower Stalk Length

It was obvious from the data presented in Table 1. and graphically illustrated in Fig. 1. that significantly longest flower stalk length (59.50 cm) was recorded in cv. Top Secret (T₁) and observed comparable with Jumelia (T₂), Avalanche (T₃) and Gold Strike (T₄) However, the smallest stalk length (46.60 cm) was recorded in Peach Avalanche (T₁₀).

Top Secret recorded longest flower stalk while cultivar Peach Avalanche recorded smallest length of flower stalk. The variation in flower stalk length among cultivars might be attributes of difference in genetic make up and also due to the higher carbohydrates level in the stalk. Similar result has been reported by Soujanya et al. [7] and Muthulakshmi et al. [5] in Rose who also reported variation in flower stalk length due to varietal difference.

3.5 Stem Girth

The data showed on Table 1. and graphically illustrated in Fig. 1. measured stem girth as shown by significantly different cultivars of rose. Significantly superior maximum stem girth (0.73 cm) was observed in cv. Top Secret (T₁), which was statistically *at par* with Jumelia (T₂), Avalanche (T₃) and Gold Strike (T₄). However, the minimum stem girth (0.49 cm) was obtained in cv. Peach Avalanche (T₁₀).

The result obtained from the present study clearly exhibited that cv Top Secret noted maximum stem girth of rose cultivars while Peach Avalanche recorded minimum stem girth. Variation may be due to genetic make up of the cultivars, may be due to varied response to cultural operation like bending cutting and external environmental conditions. Similar results were obtained in the present study as supported by Muthulakshmi et al. [5].

3.6 Fresh Weight of Flower (g)

The data showed on Table 1. and graphically illustrated in Fig. 1. measured fresh weight of

flower as shown by significantly different cultivars of rose. Significantly superior maximum fresh weight of flower (43.95 g) was observed in cv. Top Secret (T₁), which was statistically at par with Jumelia (T₂), Avalanche (T₃) and Gold Strike (T₄). However, the minimum fresh weight of flower (31.87 g) was obtained in cv. Peach Avalanche (T₁₀). On perusal of result it is clearly indicated that the variation in fresh weight of flower among the cultivars was mainly because of different flower size. Variation in fresh weight of many varieties is attributed to the differences in genetic characters of the varieties. Similar result were reported by Luo et al. [8], Kazaz et al. [9] and Baidya et al. [10] in Rose [11,12,13].

4. CONCLUSION

It was concluded that varieties Top Secret, Jumelia and Avalanche have emerged as promising cultivars with respect to growth, flower yield and quality flower. These varieties are suitable for commercial cultivation under naturally ventilated polyhouse in the Chhattisgarh plain.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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