

**“STUDIES ON EVALUATION OF DIFFERENT DUTCH ROSE VARIETIES UNDER NATURALLY VENTILATED POLYHOUSE CONDITION”**

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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 (T<sub>1</sub>), Jumelia (T<sub>2</sub>), Avalanche (T<sub>3</sub>), Gold Strike (T<sub>4</sub>), Revival (T<sub>5</sub>), Naranga (T<sub>6</sub>), Solaire (T<sub>7</sub>), Hot Shot (T<sub>8</sub>), Volcano (T<sub>9</sub>) and Peach Avalanche (T<sub>10</sub>). The maximum plant height (84.77 cm), maximum number of shoots after bending (4.84), maximum bud diameter (2.08 cm), maximum bud length (4.98 cm), maximum vase life (9.75 days) maximum number of cut flower per plant (21.18), and maximum number of cut flower per square meter (142).

**Keywords:** Plant height, Bud diameter, bending, vase life and cut flower.

**Introduction**

Floriculture plays an important role to increase the income. India has an ancient heritage when it comes to floriculture. A consistent increase in demand for cut and potted flowers has made floriculture as one of the important commercial trades in Indian agriculture. (Gauraha *et al.*, 2018). Rose ranks first among the top ten cut flowers in the international flower market. 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.

It is one of the nature 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  $2n = 4x = 28$ . Rose, botanically identified as *Rosa spp.*, is indigenous to Europe and is widely distributed in Europe. The genus *Rosa* consists of about 120 species, out of which only eight species are cultivated viz., *Rosa chinensis*, *Rosa damascena*, *Rosa foetida*, *Rosa gallica*, *Rosa gigantea*, *Rosa moschata*, *Rosa multiflora* and *Rosa wichuriana* (Soujanya *et al.*, 2018).

Rose is a perennial erect shrub with beautiful sweet – scented flowers 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, gulkand and rose attar etc. (Subiya *et al.*, 2017).

**Material and methods**

The investigation to study the “Studies on Evaluation of different Dutch Rose varieties under Naturally Ventilated 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 plant height, maximum stalk length and maximum bud length were measured by using measuring tape while, maximum number of cut flowers per plant and number of cut flower per square meter, were recorded. Secondly, bud diameter was measured by using vernier calliper in cm Thirdly, vase life was determined by counting the total days, in five randomly selected flower..

**Results and discussion**

**Plant height (cm)**

It was obvious from the data presented in Table 1.0 and graphically illustrated in Fig. 1.0 that significantly maximum plant height (84.77 cm) was recorded in cv. Top Secret (T<sub>1</sub>) and observed comparable with Jumelia (T<sub>2</sub>), Avalanche (T<sub>3</sub>) and Gold Strike (T<sub>4</sub>) However, the

minimum plant height (73.34 cm) was recorded in cv. Peach Avalanche (T<sub>10</sub>).

Top Secret recorded maximum plant height while cultivar Peach Avalanche recorded minimum plant height. The variation in plant height among the rose varieties may be due to environmental factor and genetic variability. Leaves are the functional unit of photosynthesis, particularly chlorophyll content of leaf which influence the plant growth. The leaf chlorophyll content is genetic character, that differs according to varieties. Similar variation in plant height due to cultivars was also observed in rose by Shivaprasad (2017), Soujanya *et al.* (2018) and Amita *et al.* (2021)

**Number of shoots after bending**

Data determined to number of shoots after bending as influenced by various cultivars has been presented in Table 1.0 and graphically illustrated in Fig. 1.0. The number of shoots after bending was obtained significantly maximum in (4.84) cv. Top Secret (T<sub>1</sub>) which was comparable with cv. Jumelia (T<sub>2</sub>), during all phases of studied. However, the minimum number of shoots after bending (2.54) was noted in Peach Avalanche (T<sub>10</sub>).

Top Secret recorded maximum number of shoots after bending while, cultivar Peach Avalanche recorded minimum number of shoots after bending. Variation might be due to the bottom breaks or bending of shoot which hinders the apical dominance and enhances the production of basal shoots. Due to higher light interaction and increased photosynthetic efficiency especially in vigorous cultivars (Hench, 1981). Cultivars Volcano and Peach Avalanche recorded least number of shoot production. Similar variation was also reported by Suganthi *et al.* (2019), and Muthulakshmi *et al.* (2022)

**Bud diameter (cm)**

It was obvious from the data presented in Table 1.0 and graphically illustrated in Fig. 1.0 that significantly maximum bud diameter (2.08 cm) was recorded in cv Top Secret (T<sub>1</sub>) and observed comparable with Jumelia (T<sub>2</sub>), Avalanche (T<sub>3</sub>) and Gold Strike (T<sub>4</sub>) However, the minimum bud diameter (1.52 cm) was recorded in cv Peach Avalanche (T<sub>10</sub>). Maximum bud diameter was recorded in Top Secret and was least in Peach Avalanche. Variation in diameter of bud is mainly due to the genetic make-up, which might be further modified by the environmental conditions prevailing during the time of experiment. These results are in conformity with the results reported earlier in Rose by Man Bihari *et al.* (2009) and Muthulakshmi *et al.* (2022).

**Bud length (cm)**

Data determined to bud length as influenced by various cultivars has been presented in Table 1.0 and graphically illustrated in Fig. 1.0. The bud length was obtained significantly maximum (4.98 cm) in cv. Top Secret (T<sub>1</sub>) was observed comparable with cv. Jumelia (T<sub>2</sub>) and Avalanche (T<sub>3</sub>), during all phases of studied. However, the minimum bud length (3.52 cm) was noted in Peach Avalanche (T<sub>10</sub>). The result

obtained from the present study clearly exhibited that cv Top secret noted maximum bud length of rose cultivars while Peach Avalanche recorded minimum bud length .Variation may be due to genetic makeup of the cultivars, may due to varied cultural operation like bending and external environmental conditions. Similar results were obtained in present study as supported by Man Bihari *et al.* (2009) and Suganthi *et al.* (2019).

#### Vase life (days)

The data showed on Table 1.0 and graphically illustrated in Fig. 1.0, recorded maximum vase life (9.75 days) in Top Secret (T<sub>1</sub>) significantly similar with Jumelia (T<sub>2</sub>), Avalanche (T<sub>3</sub>), Gold Strike (T<sub>4</sub>), while the minimum vase life (5.75days ) was noted in Peach Avalanche (T<sub>10</sub>) . Significant difference was observed among the different cultivars of rose with respect to vase life .Top Secret recorded maximum vase life (days),while Peach Avalanche recorded minimum vase life (days). The variation in shelf life of flower might be due to differences in senescencing behaviour of the variety by producing higher amount of ethylene formation enzymes and ethylene as reported by Jangde *et al.*, (2019) in Gerbera. Similar variation was also reported by Shivaprasad (2017).

#### Number of cut flowers per plant

The data showed that Table 1.0 and graphically illustrated in Fig. 1.0, recorded maximum numbers of cut flowers per plant (21.18) in Top Secret (T<sub>1</sub>) that significantly similar with Jumelia (T<sub>2</sub>), Avalanche (T<sub>3</sub>) and Gold Strike (T<sub>4</sub>). While, the minimum numbers of cut flowers per plant (14.34) was noted in Peach Avalanche (T<sub>10</sub>). Significant differences was observed among the different cultivars of rose with respect to numbers of cut flowers per plant. More numbers

of cut flowers per plant were produced in cultivars Top Secret whereas, less number of flowers were recorded in Peach Avalanche. The variation might be attributed to the greater leaf area and more number of leaves per plant as well as plant spread would have resulted in production and accumulation of maximum photosynthesis, resulting the production of more number of flowers with and genetic make up . The similar results were observed in Rose by (2018), Suganthi *et al.* (2019) and Muthulakshmi *et al.* (2022)

#### Number of cut flower per square meter

It was obvious from the data presented in Table 1.0 and graphically illustrated in Fig. 1.0, that significantly maximum numbers of cut flowers per square meter (142) was recorded in cv Top Secret (T<sub>1</sub>) and observed comparable with Jumelia (T<sub>2</sub>), Avalanche (T<sub>3</sub>) and Gold Strike (T<sub>4</sub>) However, the minimum numbers of cut flowers per square meter (100.56) was recorded in Peach Avalanche (T<sub>10</sub>) . Maximum numbers of cut flowers per square meter were produced in cultivars Top Secret whereas, minimum number of cut flower were recorded in Peach Avalanche. The variation in cut flower might be due to genetic variability , cultural operation like bending, pruning and effect of environmental conditions among the different cultivars of Rose. The similar results were observed in Rose by Parmar *et al.* (2015),

#### 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.

**Table1 : Varietal evaluation of rose for growth quality and flower yield parameters**

Tr. No	Treatments	Plant height (cm)	Number of shoots	Bud diameter (cm)	Bud length (cm)	Vase life ( days)	Number of cut flower per plant	Number of cut flower per square meter
T <sub>1</sub>	Top Secret	84.77	4.84	2.08	4.98	9.75	21.18	142
T <sub>2</sub>	Jumelia	83.63	4.65	1.92	4.70	9.14	20.15	136.28
T <sub>3</sub>	Avalanche	82.04	4.18	1.94	4.55	8.47	19.64	131.53
T <sub>4</sub>	Gold Strike	81.07	3.98	1.79	4.38	7.78	18.92	128.4
T <sub>5</sub>	Revival	79.41	3.88	1.75	4.21	7.69	18.31	124.35
T <sub>6</sub>	Naranga	77.73	3.46	1.71	4.13	7.36	17.15	116.03
T <sub>7</sub>	Solaire	76.5	3.23	1.66	4.05	7.04	16.53	111.14
T <sub>8</sub>	Hot Shot	75.65	3.00	1.62	3.86	6.65	16.29	106.8
T <sub>9</sub>	Volcano	74.31	2.81	1.57	3.72	6.33	15.08	103.33
T <sub>10</sub>	Peach Avalanche	73.34	2.54	1.52	3.52	5.75	14.34	100.56
SEm (±)		0.78	0.09	0.78	0.21	0.13	0.24	0.47
C.D. at 5%		2.32	0.28	2.32	0.65	0.39	0.61	1.42

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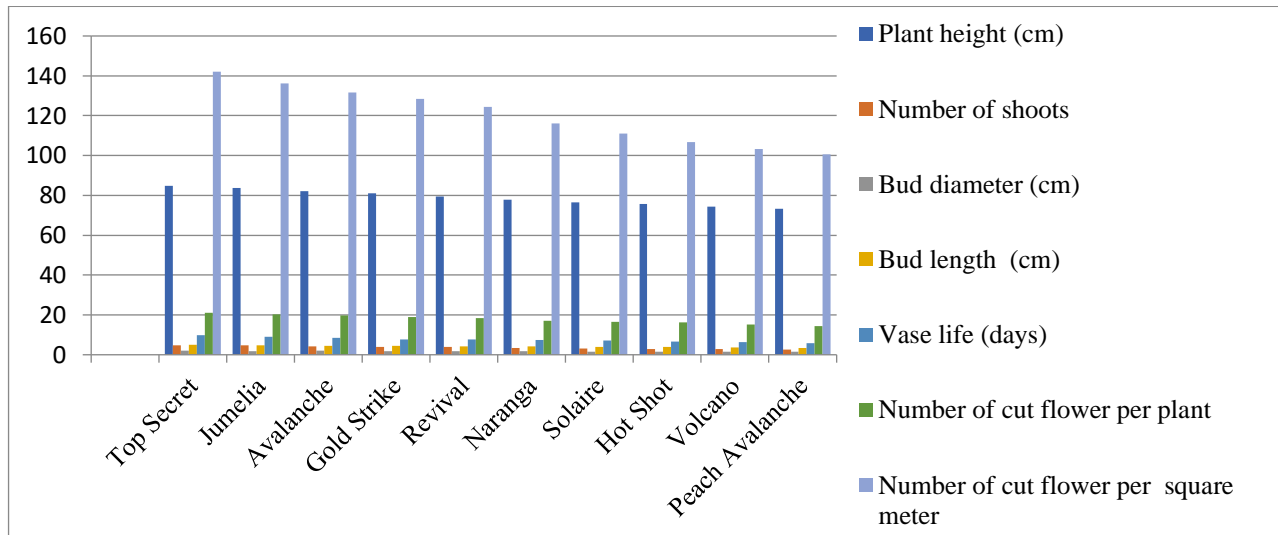


Fig 1 : Varietal evaluation of rose for growth quality and flower yield parameters