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Per se performance of Dutch rose (*Rosa hybrida* L) varieties under polyhouse in shevaroy hills

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Abstract

A present investigation was carried out to Evaluation of Dutch Rose (*Rosa hybrida* L.) varieties for growth, yield and quality. The varieties were grown under poly house conditions in in Randomized Block Design (RBD) with 11 treatments and 3 replications. The results revealed that there was a variation among the varieties for growth, yield and quality characters. Among the varieties highest stem length was recorded in Top Secret followed by Rock Star, similarly maximum vase life was recorded in Top Secret and Rock star. The remaining parameters like plant height, number of leaves, number of shoots, bud length, flower diameter, number of flowers per plant, number of petals per flower were also higher in the variety Top Secret closely followed by Rock Star. The study revealed that the Top Secret and Rock Star was the best performing varieties under poly house in shevaroy hills.

Keywords: Dutch rose varieties, growth, yield and quality

Introduction

Rose (*Rosa hybrida*) is most popular cutflower in the world, which is considered as 'Queen of flowers'. The genus Rosa belonging to the family Rosaceae which contains more than 200 species with a basic chromosome number of $n=7$ and varying level of ploidy. In International cut flower trade Dutch rose ranks first among the cut flowers. The major producers of rose cut flowers are Netherlands (70%) followed by Columbia (13%), Israel (8%) and Italy (7%). Dutch rose cultivated mostly for export purpose.

In European countries flower production is declined during the winter season. So, there is a great demand for fresh flowers in the European market. India is bestowed with several agro climatic zones, Roses can be grown throughout the year in the India. 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. So the expansion of the area is much felt need in the entire viable region to increase the production. In Tamil Nadu, Hosur (Krishnagiri district) and surrounding areas adjacent to Bangalore of Karnataka have been identified as possibly the best region, suited for cut flower production.

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. Hence, present study was formulated to identify suitable Dutch rose variety for growth and quality under polyhouse in Shevaroy hills of Yercaud condition.

Materials and methods

The experiment was conducted at farmer's field, shevaroy hills, yercaud, During the year 2018 -2019. The experimental site is geographically situated between $11^{\circ} 04'$ and $11^{\circ} 05'$ North latitude and $78^{\circ}05'$ and $78^{\circ} 23'$ East longitude at an altitude of 1250m above mean sea level, average maximum and minimum temperature during the study period $30^{\circ}C$ and $12^{\circ}C$, respectively. Average Relative humidity recorded was 75%. The experiment was laid out in Randomized block design, 11 varieties with 3 replications, each replication consist of 10 plants. The varieties are Top Secret, Brilliant, Solair, Avalanche, Rock Star, Peach Avalanche, Candy Avalanche, Espana, Jumilia, Hot Shot, Bon Heur. They were planted at spacing of 40×45 cm. All the cultural operations like irrigation, weeding, hoeing, manuring etc., were done commonly for each treatment. The data was collected on plant height, No. of shoots, No. of leaves, Thorn density, Days to flower bud initiation, flower bud length, Diameter of fully

opened flower, No. of flowers per plant, No. of petals per plant, stalk length, vase life. Observation were recorded on vegetative parameters (Table. 1) and flower characters (Table. 2) the collected data were statistically analyzed by using SPSS software.

Result and Discussion

Vegetative parameters

Vegetative parameters like plant height, No. of shoots, No. of leaves and thorn density are plays a key role in deciding the flower yield. These characters varied among the dutch rose varieties (Table. 1)

The plant height was varied among the varieties of Dutch rose. Top Secret had recorded maximum plant height (121.03cm) closely followed by Rock Star (118.30cm). Statistically, both varieties are on par with each other. Minimum plant height was recorded in Bon Heiur (88.50cm). Almost similar reports have been reported by (Tabassum *et al.*). Maximum plant height varieties produced longer stalk length compared to minimum plant height varieties (Ramzan *et al.*, 2014) ^[1]. The variation in plant height among the rose varieties may be due to environmental factor and genetic variability.

Maximum number of shoots/ plant (6.95) was recorded from Top Secret and followed by Rock Star(6.93). Statistically, both varieties are on Par with each other. Minimum number of shoots/ plant 3.10 and 3.70 were recorded in Bon Heiur and Solair. Similar findings were reported by (Shahrin *et al.*, 2015) ^[4]. Variation in the number of shoots/plant might be due to the varietal character of the plant.

Maximum number of leaves were noticed in Top Secret (99.45), closely followed by Rock Star (99). Statistically, both the varieties were at par with each other. Minimum number of leaves were recorded in Espana (80.10) and Candy Avalanche (80.30). 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.

Maximum number of thorns present in 10cm shoot was recorded in (11.40) Jumilia and minimum number of thorns were recorded in (2.03) Solair and Top Secret. The significant variation in number of thorns might be due to the genetic character of the palnt. Less thorned varieties are preferred for consumer. The variation in number of thorns present in 10 cm shoots was also reported in rose (Shahrin *et al.*, 2015) ^[4].

Number of days to flower bud initiation was varied significantly, because the variation could be a varietal character. Maximum number of days (42.46 days) was taken by Hot Shot. Minimum number of days taken for flower bud initiation was recorded in Top Secret (28.81days).The variation in days to flower bud initiation were also reported in rose (Manjula, 2005).

Floral characters

Flower characters like bud length, flower diameter, neck length, stalk length, number of petals per flower, yield and vase life were presented in (Table 2).

Maximum bud length (6.01cm) was noticed in Rock star, followed by (5.79cm, 5.64cm) Jumilia and Top Secret.

Minimum bud length (4.90cm) was noticed in Bon Heiur. The significant variation in bud length may be due to varietal character and also environment condition.

The maximum flower diameter (12.42 cm) was recorded in Top Secret, followed by (11.8cm and 11.4 cm) with respectively, Rock Star and Peach Avalanche. Minimum flower diameter (8.06cm) was recorded in Brilliant. The result was confirmed by almost similar reports reported by (Ranchana *et al.*, 2014) ^[2]. The significant variation in flower diameter might be due to the environmental condition.

The analysis of the data depicted, highest neck length (9.12cm) was noticed in Top Secret and closely followed by 9.02 cm in Rock Star. Statistically, both the varieties are on par with each other. Lowest neck length (8cm) noticed in Jumilia. Almost similar results were reported by (Ranchana *et al.*, 2014) ^[2]. The Significant variation in neck length might be due to the varietal character along with the environmental condition.

Extreme stalk length was produced from highest height variety. Stalk length is important factor for Dutch rose evaluation. The analysis of the data depicted, highest stalk length was recorded in the variety Top secret (70.63 cm), closely followed by Rock star (68.15 cm). Least stalk length was noticed in (48.63cm and 50.86 cm) Bon Heiur and Solair. The significant variation in the stalk length may be due to the varietal character and also environmental conditions. The result was confirmed by (Ramzan *et al.*, 2014) ^[1].

The analyzed data showed that significant variation in the number of petals per flower. Maximum number of 54.60 petals per flower was recorded in Rock star and closely followed by Top Secret have been 53.60 petals per flower. Minimum number of 28.80 petals per flower was found from Hot Shot. The significant variation in the number of petals of petals per flower was also reported in rose (Tabassum *et al.*, 2002, Shahrin *et al.*, 2015) ^[5, 4]. The variation in the number of petals per flower may be due to varietal character.

Maximum number of flowers per plant (26.16) was recorded in variety Top Secret, closely followed by (25.06) was recorded in Rock Star. Statistically, both the varieties were at par with each other. Minimum number of flowers per plants (15.07) was noticed in Jumilia. The variation in number of flowers per plant might be due to the varietal character and another one reason is environmental conditions. This result was confirmed by (Ranchana, 2014) ^[2].

Variation in the vase life might be due to genetic makeup of the plant. Hieghest vase life was noticed in Top Secret (17.67 days), which was closely followed by Rock Star and Jumilia with respectively (16.89 and 16.33 days) and Least vase life (13.21 days and 14.05 days) were recorded in Avalanche and Bon Heiur. Vase life of flower is considered as the important criteria for judging the commercial variety. Similar variation in vase life was reported by (Soujana *et al.*, 2018).

Conclusion

Based on the present findings it can be concluded that varieties Top secret and Solair performed best in terms of growth, yield and quality under shevaroy hills condition.

Table 1: Vegetative parameters of Dutch Rose varieties

Treatments	Plant Height (cm)	No. of leaves	No. of shoots	Thorn density	Days to flower bud initiation
Top Secret	121.03	99.45	6.95	2.03	28.81
Brilliant	99.61	89.30	4.10	3.70	32.41
Solair	94.20	85.90	3.70	2.03	35.40
Avalanche	106.03	96.80	6.10	4.40	32.60
Rock Star	118.30	99.03	6.93	3.03	30.41
peach Avalanche	106.90	90.60	5.60	4.60	36.71
candy avalanche	91.96	80.30	4.80	7.30	40.60
Espana	99.00	80.10	5.40	5.90	33.85
Jumilia	96.90	96.90	4.10	11.40	31.62
Hot shot	98.30	91.30	4.09	3.61	42.46
BonHeiur	88.50	85.60	3.10	3.09	37.89
MEAN	101.88	90.48	4.99	4.64	34.80
SE	6.17	4.58	0.35	0.46	2.33
CD	12.63	9.38	0.72	0.94	4.76

Table 2: Flower yield and quality parameters of Dutch Rose varieties

Treatments	Bud Length (cm)	Diameter of opened flower (cm)	Neck length (cm)	Stalk Length (cm)	No. of petals / flowers	No. of flowers/plant	Vase life (days)
Top Secret	5.64	12.42	9.12	70.63	53.60	26.16	17.67
Brilliant	5.10	8.06	7.48	56.30	51.30	21.92	15.33
Solair	5.20	8.52	8.13	50.86	34.30	21.32	15.00
Avalanche	5.13	10.80	7.94	58.23	42.30	23.82	14.05
Rock Star	6.01	11.80	9.02	68.15	54.60	25.06	16.33
peach Avalanche	5.51	11.40	8.70	61.34	52.00	23.97	13.01
candy avalanche	5.40	10.62	7.60	49.63	37.30	20.56	14.67
Espana	5.79	10.41	8.83	56.40	42.00	23.55	15.61
Jumilia	4.99	11.01	8.00	54.40	36.90	15.07	12.90
Hot shot	5.21	9.31	7.90	54.13	28.80	19.05	15.00
BonHeiur	4.90	9.05	8.76	48.63	36.60	18.22	13.21
MEAN	5.35	10.31	8.32	57.15	42.70	21.70	14.80
SE	0.27	0.44	0.39	2.17	0.99	1.51	0.65
CD	0.56	0.91	0.80	4.45	2.03	3.10	1.32

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