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Varietal Evaluation of Hybrid Tea Roses under the Plains of West Bengal, India

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A B S T R A C T

The investigation was carried out to evaluate the varietal performance of fifteen HT rose cultivar under the plains of West Bengal. The varieties *viz*. Mandelon, Varcelia, Cherry Brandy, John John, Goldstrike, Texas, Teneke, Hollywood, Naranga, Johny Leonida, First Red, Bordo, Passion, Aqua and Pink Dutch were chosen for the study. There were significant differences on all the attributes studied. In terms of long stem length the cultivar First Red, Mandelon and Bordo recorded the highest from the other varieties. While in terms of yield cultivar Varcelia, Johny Lionida, Aqua and Pink Dutch recorded the highest yielder. Thus the cultivar Bordo, First Red, Varcelia, Mandelon has emerged as a promising cultivars in terms of growth and quality under West Bengal condition.

Introduction

Rose universally acclaimed as the Queen of Flowers is one of the world's most popular flowers. Among cut flowers, Rose (*Rosa spp*) has occupied a unique position both in beauty and trade. Rose ranks first among the top ten cut flowers in the international flower market. Among all other cut flowers, roses lead in popularity because of their beauty, fragrance and long lasting blooming qualities (Ghaffoor *et al.*, 2000; Tabassum *et al.*, 2002). It may be used for planting in rockeries, pots and for cut flower production. It possesses multiple uses like extraction of perfumes, vitamin C from hips for medicinal uses and for sales as cut flowers (Khan, 1978). *Rosa* species are found throughout the colder and temperate regions of the Northern hemisphere form the Arctic to the subtropics. Flower size and stem length are two important factors that dictate the value of cut-flower roses.

There are over 100 species and thousands of varieties known to exist. Mainly two types of roses are commercially grown for cut flowers; one is Hybrid Tea (HT) roses which form the bulk of cut roses sold in the market. The demand for HT roses varies with colour, sex and season of the year. Generally, red HT's are in great demand followed by yellow, pink and white. The objective of this study was to evaluate the suitable varieties for quality and yield under the plains of West Bengal.

Materials and Methods

Studies on the performance of fifteen HT roses varieties were carried out at Horticulture Research Station, Mondouri, Faculty of Horticulture, BCKV, Mohanpur, Nadia, West Bengal from September 2013 to March 2015.The varieties selected for the study were T_1- Mandelon, T_2-Varcelia, T_3-Cherry Brandy, T_4-JohnJohn, T_5-Goldstrike, T_6-Texas, T_7-Tineke, T_8-Hollywood, T_9-Naranga, T_{10}-Johny Lionida, T_{11}-First Red, T_{12}-Bordo, T_{13}-Passion, T_{14}-Aqua and T_{15}-Pink Dutch. The plants were 6 month old healthy saplings procured from a reputed nursery and planted in a raised bed with a spacing of 45 X 45 cm. The experiment was conducted in randomized block design with three replications for each treatment in which five plants were selected randomly for recording observations. The maximum temperature during the summer months varied from 28.2 ^{0} C to 41, ^{0}C and the minimum temperature during the winter varied from 6.3^{0}C to 19.8^{0}C during the experimental period. The relative humidity range from 52.5 to 100 % with a rainfall of 37.1cm and 13.4cm, respectively on both the years.

Observations were recorded on vegetative and flower characters (Table 1 and 2) and the data were statistically analyzed.

Results and Discussion

Vegetative parameters

Significant variations were observed amongst the fifteen HT rose cultivars for most of the characters. The cultivar First Red (T_{11}) registered the maximum plant height (112.7 cm) and the shortest was recorded from John John (T4) (38.17cm). The variation in plant height among the rose varieties may be due to genetic variability, which was tested under this trial. Another possible reason for variation in plant height may be due to the effect of environmental conditions prevailing during field trial (Lundstad, 1975; 1979). Maximum number of primary branches (5.83) was reported from cultivar Texas and least (2.92) from passion. In case of the secondary branches, cultivar Aqua (14.94) and Texas (14.58) recorded the highest while John John (5.83) recorded the least. The variation in shoot number was also reported by Paramagoudar *et al.,* (2014). The cultivars Hollywood (35.82cm^2) and Pink Dutch (35.76cm^2) recorded maximum leaf area whereas minimum (19.25cm^2) in cv. Passion which may be due to cultivars varied in their leaf length. Paramagouudar (2014) also reported the same. Maximum spread of plant canopy was noticed in cultivar Varcelia (77.96cm). This could be a result of formation of more ground shoots, giving an adequate. The cultivar John John recorded the least spread of canopy (49.38cm).

Reproductive parameters

Cultivar Mandelon, Texas and Johnyleonida took 17.22 to 21.5 days to initiate flower bud whereas, cultivars Tineke, Bordo, First Red and John John were late to initiate flower bud (27.83 days). The variation in days to initiate flower buds can be attributed to varietal characteristics. Similar findings were observed by Bhattacharjee *et al.,* (1993) and Fascella and Zizzo (2007). Cultivar Mandelon, Johnyleonida, Tineke, Aqua and Passion were early to sepal reflex after flower bud emergence. This could be because of varietal character and environmental conditions prevailing during field trial. Maximum days required for flower bud emergence to sepal reflex was noticed in Texas (31.11 days) followed by Bordo (30.77 days). The variety Mandelon took minimum 22.77 days. The significant variation with respect to days required to attained cup shape (CS) from Sepal reflex (SR) was observed.

Table.1 Vegetative parameters of different hybrid tea rose varieties

Treatments	Plant height(cm)	Leaf area(cm2)	Plant spread(cm)	Primary branches	Secondary branches
Mandelon(T_1)	91.63	28.51	53.63	3.94	7.56
Varcelia(T_2)	93.58	29.53	77.96	3.69	7.75
Cherry Brandy(T_3)	67.44	26.11	63.13	3.78	8.00
John John(T_4)	38.17	23.92	49.38	2.98	5.83
Goldtrike(T_5)	56.44	31.66	54.79	3.77	7.92
Texas(T_6)	97.13	31.14	71.38	5.83	14.58
Tineke(T_7)	80.96	29.38	65.38	4.36	10.58
Hollywood(T_8)	85.88	35.82	63.5	4.42	10.33
Naranga(T_9)	79.63	26.29	55.08	3.75	10.67
JohnyLionida(T_{10})	75.29	25.77	58.13	4.56	13.11
First Red(T_{11})	112.17	30.13	68.38	4.67	8.89
Bordo(T_{12})	76.50	22.83	58.21	4.06	10.78
Passion(T_{13})	61.58	19.25	53.88	2.92	9.58
Aqua(T_{14})	87.88	28.34	68.46	4.03	14.94
Pink Dutch(T_{15})	88.42	35.76	70.00	3.67	8.03
SEm(±)	1.39	1.19	1.55	0.2	0.54
CD at 5%	3.93	3.36	4.39	0.58	1.53

Table.2 Reproductive parameters of different Hybrid Tea rose varieties

Treatments	Days to 1st FBI	FBI –SR (Days)	SR – CS (Days)	FBI –CS (Days)	No of flowers	Wt of flowers(gm)	Stalk length(cm)	Stalk diameter (cm)	Pedicel length(cm)	Pedicel diameter(cm)	Bud length(cm)	Bud diameter(cm)	No of petals	Vase life (Days)
Mandelon	19.92	17.22	5.55	22.77	59.92	28.5	57.36	1.32	9.88	1.28	4.99	3.2	23.82	4.29
Varcelia	25.17	21.17	7.18	28.34	100.08	22.67	41.55	1.28	8.26	1.21	5.62	3.72	32	6.88
Cherry Brandy	23.17	22.26	6.3	28.56	62.92	27.42	44.67	1.45	8.63	1.36	5.3	3.92	39.65	7.61
John John	26.25	22.67	5.28	27.95	36.17	17.86	31.89	1.07	6.2	1.03	4.18	3.28	26.53	6.52
Goldtrike	22.33	22.86	6.25	29.11	66.08	20.9	34.66	1.23	7.15	1.16	4.27	3.42	35.88	6.08
Texas	21.42	26.11	5	31.11	78	29.89	50.43	1.63	8.86	1.5	4.38	3.58	19.73	7.09
Tineke	27.83	19.55	5.51	25.06	77	26.39	46.22	1.49	9.26	1.41	5.4	3.21	62.88	4.75
Hollywood	25.83	23.22	6.77	29.99	79.83	25.2	36.23	1.29	6.84	1.25	6.13	4.16	69.3	6.42
Naranga	24.33	21.67	5.86	27.53	54.33	24.14	39.6	1.35	8.03	1.28	4.44	3.05	29.47	7.29
JohnyLionida	21.5	18.76	4.73	23.49	84.5	19.71	37.14	0.99	7.75	0.96	3.96	2.78	22.15	5.08
First Red	27.17	20.91	6.11	27.02	60.42	34.41	62.36	1.9	11.17	1.79	4.63	3.95	33.59	8.13
Bordo	27.25	23.59	7.18	30.77	54	31.88	53.31	2.22	7.38	1.83	5.16	4.1	46.02	8.85
Passion	24.25	19.95	5.56	25.51	49.83	18.57	34.5	0.91	5.7	0.87	4.33	2.9	41.65	7.43
Aqua	23.33	19.34	5.51	24.85	83.5	22.29	33.39	1.42	8.47	1.28	4.52	3.39	36.88	5.92
Pink Dutch	24.67	21	5.75	26.75	76.08	30.67	38.65	1.3	7.46	1.25	4.7	4.27	50.89	5.75
SEm(+)	0.33	0.1	0.06	0.11	2.63	0.38	0.57	0.05	0.14	0.08	0.09	0.07	0.38	0.15
CD at 5%	0.94	0.29	0.17	0.32	7.45	1.08	1.61	0.15	0.4	0.23	0.25	0.19	1.09	0.43

Maximum value was in Varcelia and Bordo (7.18 days) and minimum in Johny Leonida (4.73 days). Long stalk for cut roses are pre-requisite in the international market. Whereas, short stalk roses could be sold well in Indian local market. In the present investigation, cultivars First Red (62.36cm), Mandelon (57.36cm) and Bordo (53.31cm) produced long stalk length, while cultivars John John produced the shortest stalk length (31.89cm). Similar results were reported by Khattak *et al.,* (1995), Raheela Tabassum *et al.,* (2002) and Bhattacharjee *et al.,* (1993). Cut flowers should possess a strong stem to hold bloom firmly erect (Malik, 1968). Stem diameter indicates the sturdiness of the cut flowers. In this investigation, stalk diameter was maximum in cultivar Bordo (2.22cm) and minimum in cultivar Passion (0.91cm). Variation in stalk diameter is often a significant of varietal differences, rather than a significant of poor culture (Thomson and Wilson, 1957). Maximum pedicel length was noticed in First Red (11.17cm) and cultivar Passion (5.7cm) recorded the least pedicel length. This variation may be attributed because of varied genetic makeup. In addition to stem length, quality of cut flowers is judged based on its bud length. Maximum bud length was recorded in the cultivar Hollywood (6.13cm) and minimum (3.96cm) in Johny Leonida. Maximum number of petals per bloom was noted in Hollywood, whereas, minimum in Texas. Similar variation was also reported by Fascella and Zizzo (2007). Among the cultivars studied Varcelia, Johny Leonida, Aqua and Pink Dutch produced maximum number of flowers per plot (1.44 sq m.) and can be grouped under high yielders. Whereas, Goldstrike, Cherry Brandy, First Red, Mandelon and Bordo falls into the category of moderate yielders, however, other cultivars can be classified as low yielders. Variation in flower yield was also noted by Sindhu and Rameshkumar (2004); Millia, (1974) and Scharoder (1975). The maximum flower weight was recorded in the cultivar First Red while minimum in the cultivars John John and Passion. The variation in flower number / plot and weight of individual flowers among various rose cultivars may be due to genetic variability, which was tested under this trial. The variation in flower yield was also observed among rose cultivars by Bogamozova (1978) and Plomacher (1976). Maximum vase life (8.85days) was noted in Bordo followed by First Red (8.13). Cultivar Mandelon showed minimum vase life (4.29 days). The results reported by Bhattacharjee (1994) also lend to support these findings.

Thus from the compilation of readings obtained during the study it can be concluded that cultivar Bordo, First Red, Varcelia and Mandelon have emerged as a promising cultivars in terms of growth and quality under West Bengal conditions.

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