Research Note

PERFORMANCE OF *ROSA HYBRIDA* CULTIVARS UNDER AGRO-CLIMATIC CONDITIONS OF ISLAMABAD, PAKISTAN

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ABSTRACT

The study was conducted at Department of Floriculture and Land Scape, NARC, Islamabad, Pakistan during May to July 2011. The objective of the study was to assess the performance of exotic cultivars of hybrid tea roses under agro-climatic conditions of Islamabad. Nineteen hybrid rose cultivars were studied and data was collected on number of branches per plant, plant height (cm), stalk length (cm), number of flowers per plant and flowering percentage per plot. The highest stalk length (24.6, 24cm) was recorded in cultivars Double Delight and Signature. Maximum plant height (100cm) was recorded in Jagua followed by Pink Peace and Honey Perfume (97cm). While minimum plant height (67.33cm) was noted in Abby De Culnry. Maximum number of flowers (52) were produced by cultivar Honey Perfume followed by Pink Peace (50) and Allice Red (34). Supreme flowering percentage (65%) was observed in cultivar Abby De Culnry followed by Julias Rose (60%) and Cendrila (52%). Results of the study suggest that Double Delight, Signature, Honey Perfume and Pink Peace performed better during hot months of May to July and these are best suited cultivars for further research work.

KEYWORDS: ***Rosa hybrida;*** **hybrid tea roses; cultivars; performance; agronomic characters; Islamabad; Pakistan.**

INTRODUCTION

The roses belonging to family Rosaceae are most popular and fabulous flowers. Climatic and edaphic factors play crucial role for successful production of roses. These factors not only affect the growth, production and yield but also quality of crop. Among these light, humidity and temperature are promising parameters which directly influence the plant growth. The ideal temperature for rose production is 20-25ºC during the day and 13-16ºC at night along with 8 hours of sunlight (14). Pakistan has a great potential for cut flower production. So, due to favourable agro-climatic conditions of the country, a wide range of cut rose cultivars can be grown to uplift the economic status of growers. Most of the hybrid rose cultivars have been developed in cool climate of world so they do not perform well in hot climatic

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conditions. Tasker (18) found that hybrid tea favours warm climate and is susceptible to low temperature. Malik and Singh (7) reported that tea roses are highly resistant to high temperature. Khattak ***et al***., (6) evaluated performance of ten exotic cultivars in D.I. Khan and found that cv. Paradise was the tallest and produced large sized flowers. Present study was aimed to investigate the performance of exotic cultivars of hybrid tea roses under conditions of Islamabad and to identify best suited cultivars to hot climatic conditions.

MATERIALS AND METHODS

The present study was conducted at Department of Floriculture and Landscape, NARC, Islamabad, Pakistan during the months of May to July, 2011. Performance of 19 hybrid tea roses cultivars including Bara Bara, Abby De Culnry, Mamorial Day, Rough Royal, Saran Bepti, Pink Peace, Julias Rose, Signature, Cendrila, M. Murad, Double Delight, Elizabeth Harkness, Allice, Red, Barkroloe Baragla Marandi; Head Liner, Honey Perfume, Decent Peace, American Beauty and Jagua was studied. Plant material was collected from Patoki, Lahore during 2008 and at the time of data recording age of plants was two and a half year. The experiment was laid out in RCBD with three replications comprising 15 plants per entry. Row to row distance was 30cm and plant to plant was 15 cm (Bredmose 2). The data was recorded on plant height (cm), number of branches, stalk length (cm), number of flowers per plant and flowering percentage per plot. Data was analysed using standard ANOVA technique by statistical software SPSS-16. Means were separated using Tuky test at P = 0.05 to check the significance of results (17).

Meteorological data

The data was recorded at station for three months (May-July) during 2011 and presented below in Table 1.

Table 1. Meteorological data for three months (May-July 2011).

	Temperature (°C)		Rainfall (mm)	Average relative humidity (%)
Months	Maximum	Minimum		
May	37.7	19.4	17.3	44.8
June	36.6	24.6	135.6	49.7
July	32.4	22.1	308.8	76.2

RESULTS AND DISCUSSION

Number of flowers per plant

Maximum number of flowers per plant (52) was produced by the cultivar Honey Perfume followed by Pink Peace (50) and Allice Red (34). Minimum number of flowers (10) was produced by the cultivar Saran Bepti and Barkrole Baragla Marandi followed by Decent Peace (11) Bara Bara (12) and Signature (13) (Table 3). Similar findings were reported by Singh ***et al***., (16) who in their study found that hybrid tea rose cv. Nurgjehan produced maximum number of flowers (58.8), largest flower diameter (9.3cm) and were most fragrant. Number of flowers per plant was highest in cv. Nania followed by cv. Devolion from the hybrid tea group (10). Variation in number of flowers per plant is related to recurrent blooming habit due to their genetic makeup (8). It was also observed that as the temperature increased humidity decreased and ultimately flower number also decreased in the month of July showing that temperature is a determinant factor for flower yield. Cultivar Paradise produced highest number of flowers in months of March and April as compared to June and July (6). In the present investigation, higher yield might be due to increase in morphological parameters like plant height, number of leaves and leaf area which help in production of more photosynthates resulting in greater accumulation of dry matter which in turn leads to production of more number of flowers per plant. Variation in flower yield was also observed previously in rose by Nagaraj (11); Sindhu and Ramesh Kumar (15) and Mantur ***et al.,*** (9).

Number of branches per plant

For number of branches per plant results of ANOVA (Table 2) indicated that cultivars showed highly significant differences with respect to number of branches per plant. Highest number of branches (7.3) was recorded in cultivar Abby de Culnry followed by Saran Bepti, Pink Peace, Allice Red and American Beauty (6 each). Minimum number of branches (3) were observed in cultivar Signature followed by Decent Peace and M. Murad (3.3 each). Qasim ***et al.*** (12) evaluated two rose cultivars Amalia and Anjeleeq and reported that the cultivar Anjeleeq produced maximum plant height (65.16 cm), higher number of branches per plant (6.55) and maximum number of leaves (217) as compared to Amalia.

Table 2. Analysis of variance for different parameters of *Rosa hybrida* L. cultivars.

Source of Variance	D.F	Plant height (cm)	Stalk length (cm)	No. of branches	No. of flowers/plant	Flowering (%)
Replications	2	23.214	6.289	12.819	25.333	68.310
Genotypes	18	327	133.564	2.4905	507.219	899.721
Error	32	0.584	0.246	0.4122	0.643	3.413

Plant height (cm)

Plant height is an important growth parameter related to morphological characters of plant. The data pertaining to plant height in different cultivars is depicted in Table 3. Data regarding plant height showed significant differences amongst cultivars. Jugua HT attained maximum (100cm) plant

Table 3. Evaluation of *Rosa hybrida* cultivars on basis of growth parameters.

Cultivars	Plant height (cm)	Number of branches/ plant	Stalk length (cm)	Number of flowers/ plant	Flowering (%age/plot)
Bara Bara H.T	79.00 kl	4.300bcd	22.300 b	12.00opq	22.000 klm
Abby De Culnry H.T	67.33 op	7.300a	20.600 c	20.000ijk	65.000 ab
Mamorial Day H.T	85.66 h	4.300bcd	14.800 f	22.00i	17.00 mno
Rough Royal H.T	84.00 hi	5.300abc	16.600 de	13.000 nop	18.000 mno
Saran Bepti H.T	82.33 ij	6.00ab	7.300 jk	10.00 q	25.000 jkl
Pink Peace H.T	97.00ab	6.00ab	5.600lmn	50.000 b	30.000 hij
Julias Rose H.T	92.33 def	4.00bcd	20.600 c	13.000 nop	60.000 b
Signature H.T	95.00 bc	3.00d	24.000 a	13.000 nop	20.000 lmn
Cendrila H.T	90.33 fg	4.00bcd	14.000f	17.00lm	52.000 c
M. Murad H.T	80.0 jk	3.300cd	16.500 de	17.00lm	45.000 de
Double Delight H.T	66.00 o	4.00bcd	24.600 a	25.000 h	20.000 lmn
Elizabeth Harkness H.T	96.33abc	4.00 bcd	20.000 c	31.000 g	15.000 nop
Allice Red H.T	95.00bc	6.00ab	11.30 gh	34.000 f	25.000 jkl
Barkroloe Baragla Marandi H.T	78.6 kl	5.00bcd	5.600 lmn	10.000 q	10.000 qr
Head Liner H.T	94.00cde	5.00bcd	16.600 de	20.000ijk	30.000 hij
Honey Perfume H.T	97.00ab	4.00 bcd	8.300 j	52.000 a	46.000 cde
Decent Peace H.T	91.66fg	3.300cd	5.00 mn	11.000 pq	15.00 nop
American Beauty H.T	92.33 def	6.00ab	8.300 j	25.00 h	40.00 ef
Jagua H.T	100 a	4.00 bcd	14.300 ef	15.00 mn	20.000 lmn
LSD value	2.5388	2.1322	1.6485	2.6629	6.1359
C.V value	0.91	14.42	5.15	3.54	6.75

Means followed by the same letter along the columns are not significantly different usingDMRT (P<0.05)

height followed by Honey Perfume (97cm), Signature, Allice Red (95cm) and Head Liner (94cm), which were highly vigorous and significantly superior over other cultivars. Whereas Double Delight attained minimum plant height (66cm) followed by in Abby De Culnry (67.3cm). Similar kind of variation in plant height was reported by Hussain and Khan (5) and Manjula (8). It was observed that the cultivars with maximum plant height produced longer flower stalk length as compared to cultivars with smaller plant heights (13). Possible cause of the variation in response of cultivars might be due to environmental, genetic and management factors. Environmental factor, like irradiance is important for the purpose of controlling transition to flowering.

Light intensity is the most important climatic factor affecting rose plant growth and flowering (19).

Stalk length (cm)

Stalk length is one of the key factors for evaluation of quality cut roses. Analysis of variance for stalk length revealed highly significant differences amongst cultivars under study (Table 2). Cultivar Double Delight achieved maximum stalk length (24.6cm), which was significantly superior over other cultivars and was followed by Signature (24cm) and Bara Bara (22.3cm). However, minimum (5cm) stalk length was registered in cultivar Decent Peace followed by Barkrole Baragla Marandi and Pink Peace (5.6 cm each) which are statistically at par (Table 3). Variation in stalk length may be attributed to varietal difference. Extreme stalk length was observed in case of tallest cultivars. The difference in flower spike length is not only influenced by genetic makeup but local environmental conditions as well as soil nutrition also play a vital role in growth and development of cut flower cultivars (3). Fascella and Zizzo (4) evaluated four varieties and reported that the cultivar Anastasia produced the higher number of stems (18.7/plant) and longest buds (5.8 cm) and the cultivar Fenice produced the maximum stem length (70 cm).

Flowering percentage

Maximum flowering percentage (65) was observed in Abby De Culnry followed by Julias Rose (60%), Cendrila (52%) and M. Murad (45%). Minimum (10%) was given by the cultivars Barkrole Baragla Marandi, followed by Elizabeth Harkness and Decent Peace (15% each). As flowering respond well to favourable temperature between 20°-25°C, these cultivars performed better during high temperature. Our results are in accordance with the findings of Tasker (18) and Malik & Singh (7) who reported that tea roses were highly resistant to high temperature and preferred warm climate.

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