Evaluation of Rose Cultivars as Cut Flower Production

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Abstract: Maximum plant height (739.83 cm) and late sprouting was recorded in engilique. Maximum number of flowers per plant (41.03) was observed in the rose variety, daydream. Alexandria and paradise had the maximum flower size (7.93 cm) maximum number of petals (58.20) in Yankee doodle and longest life persistency (17.17 days) in golden times was recorded. The maximum vase life of 8.00 days was observed in variety freesia, whereas the maximum number of branches per plant (12.50) was noted in paradise. In conclusion, alexandria and paradise are recommended for cut door beautification due to their large flower size and golden times is recommended for long flower persistency. For cut flower production freesia is recommended due to its vase life.

Keywords: Rose, Rosa indica, varieties, vase life, persistency, flower

Introduction
Rose (Rosa spp.) is an ornamental plant of family Rosaceae and can be exploited for growing in beds, borders, growing up walls, growing over arches and screens. It may be used for planting in rockers, growing under glasses, planting as ground covers, growing in pots and for cut flower production. Roses are also grown for their multiple uses like production of petals, extraction of perfumes, extraction of Vitamin C from hips, for medicinal uses and for sale as cut flowers (Khan, 1978).

The cut flower is an important floricultural product and refers to a flowering stem ending in a single flower or bearing a number of small flowers radiating from the base. Among all other cut flowers, roses lead in popularity because of their beauty, variety, fragrance and long lasting blooming season. Gladiolus, roses, tuberose, carnation and chrysanthemum are the most important flowers on an international market as cut flowers (Lemper, 1976).

Export of fresh flowers including rose flower is quite insignificant from Pakistan. In European countries during winter season snow and frost check the flower production and there is a dearth of fresh flowers in the market. Contrarily we are fortunate to have all types of climates in Pakistan and can produce the fresh flowers round the year and can export the commodity to the international market. There is a great potential for export of roses to Europe, United states, Middle East and other parts of the world. Pakistan has fetched $ 0.72 million from the export of rose flower during the year 1997-98 (Export Promotion Bureau Records).

Khattak et al. (1995) evaluated pink delight with the maximum flower vase life (8 days) and persistence with slight fragrance. While 91 petals per flower were counted in Yankee doodle with slight fragrance. Muila et al. (1995) recommended hokatu, and American heritage as cut flowers with maximum plant height.

Number of flowers/plant was highest in cv. noita followed by devotion from the hybrid tea group. Kordes (1997) derived a rose cultivar kormiller which produces double flowers with a mean diameter of 98.5 mm. Flowering is remontant and petal color is light reddish-pink (RHS 36D on the inside and RHS 3BC on the outside). Zaina et al. (2001) reported that love and double delight proved to be the best regarding early sprouting, early flowering, maximum number of branches/plant, maximum number of petals/plant, maximum flower size and late fading character. Raheela et al. (2001) also reported that alexandria and paradise are recommended for cut door beautification due to their large flower size.

Therefore the present study was carried out to evaluate different rose cultivars for cut flower production under the agro-climatic conditions of D.I. Khan.

Materials and Methods
The research on the evaluation of rose cultivars as cut flower production was carried out at Rose Progeny Garden, Faculty of Agriculture, Gomal University, D.I. Khan, during the year 1999-2000. The experiment was laid out in randomized complete block design (RCBD). The following varieties of rose were used during the study: alexandria, double delight, daydream, engilique, freesia, golden times, paradise, regnet berg, red sex and Yankee doodle. All the cultural practices such as fertilizers, irrigation, weeding, hoeing etc. were done uniformly for each treatment, farm yard manure was also used for the plant nutrition. The data on days taken to bud sprouting, days taken to flowering, number of branches per plant, number of flowers per plant, plant height (cm), flower size (cm), number of petals per flower, flower persistence and flower vase life of the different rose cultivars were recorded.

The statistical analysis was performed by using ANOVA techniques (Steel and Torrie, 1984), while DMR test (Duncan, 1955) was adopted to detect the statistical different treatment means.

Results and Discussion
Days to sprouting: The data pertaining to the number of days to bud sprouting showed significant variations in different varieties of rose (Table 1). Maximum number of days to bud sprouting (46.17) was taken by engilique, which was closely followed by daydream which took (45.67) days to sprout the buds. The minimum duration to bud sprouting (32.83) days was taken by double delight. Paradise, alexandria and regnet berg were at par by taking 37.33, 36.63 and 36.33 days to sprout their buds, respectively. The variation in days of sprouting can be attributed to varietal characteristics. This is in contrary with the results of Khattak (1991), might be due to the age of the plant and temperature.

Days to flowering: All the cultivars produced flowers within the range of 41.83 to 54.67 days (Table 1). The most flowers producing varieties were daydream and engilique, both took 64.67 days to flowering, followed by Yankee doodle taking 53.17 days. Statistically, all these three cultivars were at par to each other. The shortest time (41.83 days) to flowering was taken by red sex. Almost similar results have been reported by Khattak et al. (1995). They might have responded differently to various environmental conditions and age of the tree.

Number of branches per plant: Paradise possessed the maximum number of branches/plant (12.50), followed by engilique and red sex with 10.67 and 9.17 number of branches (Table 1). Golden times, alexandria, Yankee doodle and daydream were statistically at par with 7.73, 7.50, 7.17 and 7.00 number of branches per plant. Freesia produced the minimum number of branches/plant (4.17). Zaina et al. (2001) also reported that paradise is one of the maximum branches producing variety of rose. Khattak (1991) reported that different rose cultivars produced 3.33 to 7.33 branches per plant, which is contrary to the present findings. This might be due to the age of the plants and the prevailing temperature.
Table 1: Data regarding growth parameters of different rose cultivars for cut flower production

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Days to sprouting</th>
<th>Days to flowering</th>
<th>Branch/plant</th>
<th>Flower/plant</th>
<th>Plant height (cm)</th>
<th>Flower size (cm)</th>
<th>Petals/flower</th>
<th>Flower persistence</th>
<th>Flower vase life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandra</td>
<td>36.83±e</td>
<td>47.83b</td>
<td>7.50±d</td>
<td>10.83a</td>
<td>107.67d</td>
<td>7.93a</td>
<td>33.80b</td>
<td>10.58a</td>
<td>7.00ab</td>
</tr>
<tr>
<td>Double-delight</td>
<td>32.83g</td>
<td>44.33d</td>
<td>6.17f</td>
<td>5.33f</td>
<td>87.17f</td>
<td>7.90a</td>
<td>24.57f</td>
<td>12.17d</td>
<td>6.00bcd</td>
</tr>
<tr>
<td>Day-dream</td>
<td>46.87a</td>
<td>54.67a</td>
<td>7.00e</td>
<td>41.00a</td>
<td>95.60e</td>
<td>5.47b</td>
<td>33.47b</td>
<td>14.83b</td>
<td>6.33bc</td>
</tr>
<tr>
<td>Englèque</td>
<td>46.17a</td>
<td>54.67a</td>
<td>10.67b</td>
<td>18.17bc</td>
<td>139.83a</td>
<td>6.60c</td>
<td>30.83c</td>
<td>10.67e</td>
<td>6.83ab</td>
</tr>
<tr>
<td>Freesia</td>
<td>39.67c</td>
<td>45.33d</td>
<td>4.17f</td>
<td>11.33de</td>
<td>91.83ef</td>
<td>7.30b</td>
<td>24.07g</td>
<td>13.76c</td>
<td>8.00a</td>
</tr>
<tr>
<td>Golden times</td>
<td>34.67f</td>
<td>44.67d</td>
<td>7.73de</td>
<td>20.67b</td>
<td>119.00c</td>
<td>7.37b</td>
<td>28.23cd</td>
<td>17.14b</td>
<td>7.15ab</td>
</tr>
<tr>
<td>Paradise</td>
<td>37.33d</td>
<td>47.67b</td>
<td>12.50a</td>
<td>18.93c</td>
<td>112.17cd</td>
<td>7.93a</td>
<td>26.83ef</td>
<td>11.38d</td>
<td>5.50cd</td>
</tr>
<tr>
<td>Regret berg</td>
<td>36.33e</td>
<td>46.87bc</td>
<td>6.50e</td>
<td>19.90b</td>
<td>127.17b</td>
<td>6.17e</td>
<td>18.97h</td>
<td>6.67g</td>
<td>6.00d</td>
</tr>
<tr>
<td>Red sex</td>
<td>35.33ef</td>
<td>41.83e</td>
<td>9.17c</td>
<td>13.83d</td>
<td>132.87ab</td>
<td>7.20b</td>
<td>27.20de</td>
<td>8.06f</td>
<td>7.00ab</td>
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<tr>
<td>Yankee-doodle</td>
<td>43.93b</td>
<td>53.17a</td>
<td>7.17de</td>
<td>18.67bc</td>
<td>106.33d</td>
<td>6.83c</td>
<td>59.20a</td>
<td>15.25b</td>
<td>7.16ab</td>
</tr>
<tr>
<td>LSD (0.01) value</td>
<td>1.61</td>
<td>1.43</td>
<td>1.28</td>
<td>2.57</td>
<td>7.32</td>
<td>0.26</td>
<td>2.64</td>
<td>0.63</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Means with different letters differ significantly at P < 0.01

Number of flowers per plant: Highly significant difference regarding the number of flowers per plant (Table 1) revealed that daydream produced maximum number (41.00) of flower per plant, followed by golden times and regret berg with 20.67 and 19.50 flowers per plant. Double delight yielded the minimum number of flower (6.33) per plant. Khatkatt (1991) also reported that the highest number of flowers per plant in the rose variety daydream. Theoretically, taller plants should have more number of flowers by the virtue of more nodes. However, plant height is not only the factor that influences the number of flowers. Number of flowers in roses could be combined the effect of plant height and climatic conditions of the area.

Plant height (cm): The analysis of the data depicted that maximum plant height (139.83 cm) was observed in englèque, closely followed by red sex with 132.67 cm plant height (Table 1). Statistically, both these cultivars were at par with each other. Minimum plant height was observed as 87.17 cm from double delight, followed by 91.83 cm plant height from freesia. Statistically, paradise, alexandrea and yorkie doodle were at par to each other with their plant height as 112.17, 107.67 and 106.33 cm, respectively. Zarina et al. (2001) also observed that englèque was the most tallest variety with a height of 139.4 cm.

Flower size (cm): Flower size is a very important factor determining the cut flower value of roses. Maximum flower size of 7.93 cm was recorded in cultivars Alexandrea and paradise, closely followed by double delight with 7.90 cm (Table 1). All these cultivars were statistically at par with each other. Statistically no differences were observed in golden times, freesia and red sex obtaining the flower sizes of 7.37, 7.30 and 7.20 cm, respectively. Minimum flower size of 5.17 cm was observed in cultivar regret berg. Raheela et al. (2001) also reported that alexandrea and paradise were the varieties with the largest flowers.

Number of petals per flower: The highly significant data related to the number of petals per flower showed that maximum of 69.20 petals were recorded in yorkie doodle (Table 1). Alexandrea and daydream produced 33.60 and 33.47 petals per flower and were statistically the same. The minimum of 18.87 petals was noted in regret berg, followed by freesia and double delight with 24.07 and 24.67 petals per flower. These results don't coincide with the findings of Zarina et al. (2001) in which they stated that double delight produced the maximum number of (36.29) petals per plant.

Days to flower persistence: The data pertaining days to flower persistence life revealed that golden times took maximum days to senescence (17.17), followed by yorkie doodle and daydream with 15.26 and 14.83 days, respectively and were at par with each other (Table 1). Freesia, double delight and paradise possessed the persistence life of 13.76, 12.17 and 11.83 days respectively. While regret berg was observed as the most senescent (5.33) cultivar, among the rest of the cultivars. The difference in persistence life may be due varietal characteristics.

Flower vase life: Maximum vase life of 8.00 days was noted in freesia (Table 1). Yankee doodle, golden times, red sex, alexandrea and englèque took 7.16, 7.16, 7.00, 7.00 and 6.83 days respectively and were statistically at par with each other. The minimum vase life of 5.00 days was recorded in regret berg. Zarina et al. (2001) also reported that freesia had the longest vase life as compared to the other rose varieties.

References