Vegetative Growth Performance of Different Plum Rootstocks

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Abstract: The study was conducted to investigate the vegetative growth performance of Damascos, Myrobalan and Desi plum (Prunus domestica L.) rootstocks propagated by hardwood cuttings at Peshawar, during 1999. Desi (Local) plum gained maximum number (176.75) of roots, root length (58.75 cm), shoot length (375.95 cm), shoot diameter (1.82 cm) and survival (73.33 %) percentage, while there was no differences in the sprouting percentage among all rootstocks.

Key words: Rootstock, plum, hardwood cutting and vegetative growth

Introduction

Plum (Prunus domestica L.) is a stone fruit of the family Rosaceae. The fruit develops with hard shell or stone. The seed develops from the inner part of the ovary wall and soft flesh from the outer part. Trees grown from seedlings are seldom as satisfactory as those of the parents of the important species. Desi plum is considered successful rootstock for stone fruits in Pakistan and has been tested but not compared with existing rootstock. In Pakistan no body tested or compared this rootstock with existing stone fruit orchards in the plain areas of NWFP (climate, soil and diseases). Therefore, this study was undertaken at the institute, Tarnab, Peshawar. Hardwood 20 cm long, uniform and six node cuttings of plum using the method as described by Mullins and Rajasekaran (1981) were planted in perforated polyethylene bags. Bags were filled with potting mix consisting on 1:1:1 ratio, Sand, silt and organic manure (FYM). The experiment was laid out in Randomized complete Block design (RCBD), having three treatments i.e. Desi plum, Myrobalan and Damascos and were replicated four times. Each treatment has fifteen cuttings. Each cutting was placed 2/3 rd part deep in potting mix (media). After plantation, all bags were covered with transparent polyethylene sheet. All the cultural practices like weeding, irrigation and pesticide application were kept properly and accordingly. After 20 days of plantation, only one healthy shoot was selected on each cutting while the rest of shoots were thin out. The data were recorded on the following growth parameters.

- Sprouting percentage
- Shoot length (cm)
- Plant survival (percentage)
- Root numbers
- Root length (cm)
- Shoot diameter
- Root diameter

Results and Discussion

The mean values of sprouting percentage are given in Table 1. It is revealed from the analysis of variance (Table 1) that the sprouting percentage in different rootstocks i.e. Damasco, Myrobalan and Desi Plum were not...
Table 1: The Mean Values of Sprouting Percentage, Shoot Length, Shoot Diameter, No. of Roots, Root Length and Percent Plant Survival in Different rootstocks

<table>
<thead>
<tr>
<th>Treatment</th>
<th>sprouting percentage</th>
<th>Shoot length</th>
<th>Shoot Diameter</th>
<th>No. of roots</th>
<th>Root length</th>
<th>Percent plant survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damascos</td>
<td>98.67 A</td>
<td>120.00</td>
<td>0.7713</td>
<td>64.5013</td>
<td>37.13 AB</td>
<td>38.4 B</td>
</tr>
<tr>
<td>Myrobalan</td>
<td>100.00 A</td>
<td>126.75 B</td>
<td>0.91 B</td>
<td>43.75 B</td>
<td>26.28 B</td>
<td>25.03 B</td>
</tr>
<tr>
<td>Desi Plum</td>
<td>100.00 A</td>
<td>375.95 A</td>
<td>1.82 A</td>
<td>176.75 A</td>
<td>58.75 A</td>
<td>73.33 A</td>
</tr>
</tbody>
</table>

Mean showing a common letter are not significant different at 5% level of significance

LSD value for shoot length, shoot diameter, root number, root length and for survivals at 5% level of significance = 121, 0.43, 06, 50.4, 23.81, 25.57 respectively

significantly different from one another at both level of significance. Same media was used for all cuttings therefore all cuttings showed similar response in term of sprouting percentage. Which agrees of the finding and recommendation. Moreover, cutting utilizes the preserved carbohydrate (CHO) for their initial growth. The mean values of shoot length (Table 1) show that the maximum shoot length was gained by Desi plum followed by Myrobalan with (126.75 cm). The minimum shoot length (120 cm) was obtained by Damasco plum. The maximum shoot length was also reported for the same rootstock (Desi Plum). The variation in shoot length may be the varietal characteristics. The analysis of variance of shoot diameter shows that rootstocks i.e. Damasco, Myrobalan and Desi Plum show high significant variation for one another at 5% level of significant. Similarly the mean value in shows that the maximum shoot diameter (1.82 cm) was gained by Desi Rum followed by Myrobalan (0.91 cm). The minimum shoot diameter (0.77 cm) was gained by Damasco. Similar findings were reported. The mean value of Table 1 shows that the maximum root number (176.75) were produced by Desi plum followed by Demotic° with (84.5). The minimum root numbers (43.75) were produced by Myrobalan. Paulic (1983) found Marianna and Myrobalan rootstocks more vigorous in growth than Damascos or Juliana, but due to the variation in the soil and climatic conditions Desi plum gained more root numbers as compared to other rootstocks. The mean value of (Table 1) shows that the maximum root length (58.75 cm) was obtained by Desi Plum followed by Damasco (37.13). The minimum root length (26.28 cm) was produced by Myrobalan. Again our results are in contrast to Paulic (1983).

It may be due to the same reasons, which were earlier discussed for the root numbers. The mean value of percent plant survival shows that the maximum plant survival (73.33%) was recorded in Deal plum followed by Damascos and Myrobalan which were (38.4%) and (25.03%) respectively. It may be due to the acclimatisation of Desi plum to the local climatic conditions.

References
