Evaluation of Various Levels of Pruning in Falsa (Grewia asiatica L.)

Abdul Qaffoor, Saf-ur-Rahman, Saleem Jillani,
Kashif Waseem and Mohammad Ajmad Nadeem

Department of Horticulture, Faculty of Agriculture, Gomal University, D.I Khan, Pakistan
Agriculture Research Institute, Ratta Kulaichi, D.I Khan, N.W.F.P. Pakistan

Abstract: It was found that the maximum length of the branches were observed in unpruned trees. Maximum number of branches (110.00) number of leaves per branch (37.67), number of cluster per plant (65.00) number of fruits per cluster (58.33), weight of cluster per plant 42.36 g and total yield per plant (3.64kg), was observed in the pruning level of 90 cm above the ground level, while the minimum, in all the above mentioned parameters, were found in un-pruned trees.

Keywords: Falsa, Grewia asiatica, pruning, branches, cluster, yield

Introduction

Falsa (Grewia asiatica L.) belongs to the family Tiliaceae and is of commercial importance. It is a deciduous bushy plant and thrives best in the tropical climate. Hot dry summers are considered typical for ripening of fruits. Sino and Barket (1978) reported that fruit size and fruit weight were much greater in pruned trees than unpruned peach trees. Singh (1980) recommended that the cutting of the plant at a height of about 0.5 to 1 meter from the ground level. Whereas Ginal (1969) suggested that pruning at a height of 3.5 to 4 feet is considered to the best, which produces a greater number of shoots and a much higher yield than pruning at 1.5 to 2 feet or at just ground level. He also indicated that the size of the fruit was inversely proportional to the yield, however, the smaller fruits gave juice of a higher specific gravity. Shanker (1985) proposed the desirable height for pruning as 0.9 to 1.2 meters from the soil surface. Wazir (1980) reported that pruning Falsa 91.44 cm above the ground level produced higher yield than Control and the pruning at 30.48 cm above the ground level. Similarly, Gaffoor and Rehman (1987) obtained better response in term of vigour, yield, fruit size and quality of Falsa from pruning bushes at 90 cm above the ground level. Falsa fruit has aesthetic value and is favoured for making beverages. Its juice has an attractive light purple colour and has a pleasing flavour and relished much during the summer season. It is commonly grown in D.I.Khan Division where the climatic conditions are favourable for its production. However, the productivity and quality of this fruit plant is low. Of many factors, pruning is one of the most important factors responsible for its production.

Materials and Methods

A field experiment to observe the response of various pruning levels on Falsa bushes was carried out in the Gomal University, Falsa Orchard, D.I.Khan during the years 1993, 1994 and 1995. About seven years old Falsa bushes were selected for the study. The trees were spaced 8 feet apart and received uniform cultural practices. Two plants of similar size and vigour were included in each treatment. The experiment was laid out in Randomized Complete Block Design (RCBD) with three replications. Pruning was done in the first week of February, 1993, 1994 and 1995 before sprouting of buds. The observations on number of branches, length of branches (cm), number of leaves per branch, number of clusters per plant, number of fruits per cluster, weight of cluster (gm) per plant and yield (kg) per plant were recorded. The data were analyzed by using the Analysis of Variance Techniques (Steel and Torrie, 1980) and Duncan’s New Multiple Range Test (Duncan, 1955) was used to check the differences among the different treatment means, if any.

Results and Discussion

Number of branches per Plant: Data given in Table 1, regarding the number of branches per plant showed that the pruning at 90 cm above the ground level gave the maximum of 110 branches per plant, while the minimum number of branches were recorded in un-pruned treatment. Almost similar results were obtained by (Shankar, 1985).

Length of Branches (cm): Maximum length of branches were recorded in un-pruned trees as shown in the Table 1 while the minimum length of 143.7 cm was observed in the pruning level of 150 cm above the ground level. This might be due to the fact that as in the un-pruned trees, the branches were not pruned and their length increased while the pruned trees also increased in length but not as much as the un-pruned trees.

Number of Leaves per Branch: The data concerning number of leaves per branch is shown in Table 1, which elaborates that the maximum number of leaves per branch were recorded in the pruning at 90 cm above the ground level, while the minimum of 29.33 leaves per branch were obtained in un-pruned trees. Shanker 1985 also reported the similar results.

Number of fruit clusters per plant: The results pertaining to the number of clusters per plant are shown in the Table 2. Different pruning levels significantly affected the number of fruit clusters per plant with maximum fruit cluster of 8 was observed in the pruning at 90 cm above the ground level, while the minimum number of fruit cluster was recorded in un-pruned trees. Almost similar results were recorded by (Singh, 1980) who also reported that pruned trees produced more number of fruit clusters than un-pruned.

Number of fruits per cluster: It is one of the most important yield component. Different pruning levels significantly affected the number of clusters per plant. The maximum number of fruits per cluster were counted at 90 cm pruning weight of cluster were significantly affected.
Table 1: Effect of various levels of pruning on different aspects of Falsa

<table>
<thead>
<tr>
<th>Pruning Intensities</th>
<th>1993</th>
<th>1994</th>
<th>1995</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Branches per Plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (No Pruning)</td>
<td>86f</td>
<td>90a</td>
<td>86a</td>
<td>87a</td>
</tr>
<tr>
<td>16 cm above the ground</td>
<td>101cd</td>
<td>106bc</td>
<td>103c</td>
<td>105c</td>
</tr>
<tr>
<td>30 cm above the ground</td>
<td>99d</td>
<td>103c</td>
<td>104bc</td>
<td>103c</td>
</tr>
<tr>
<td>60 cm above the ground</td>
<td>102b</td>
<td>107b</td>
<td>105b</td>
<td>105b</td>
</tr>
<tr>
<td>90 cm above the ground</td>
<td>105a</td>
<td>110a</td>
<td>112a</td>
<td>110a</td>
</tr>
<tr>
<td>120 cm above the ground</td>
<td>104bc</td>
<td>106b</td>
<td>103c</td>
<td>104bc</td>
</tr>
<tr>
<td>150 cm above the ground</td>
<td>95e</td>
<td>100d</td>
<td>97e</td>
<td>97d</td>
</tr>
<tr>
<td>Length of Branches (cm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (No Pruning)</td>
<td>162NS</td>
<td>152NS</td>
<td>154e</td>
<td>163a</td>
</tr>
<tr>
<td>16 cm above the ground</td>
<td>149</td>
<td>146</td>
<td>147b</td>
<td>147bc</td>
</tr>
<tr>
<td>30 cm above the ground</td>
<td>148</td>
<td>146</td>
<td>144d</td>
<td>145cd</td>
</tr>
<tr>
<td>60 cm above the ground</td>
<td>151</td>
<td>147</td>
<td>146cd</td>
<td>147bc</td>
</tr>
<tr>
<td>90 cm above the ground</td>
<td>151</td>
<td>149</td>
<td>147bc</td>
<td>149b</td>
</tr>
<tr>
<td>120 cm above the ground</td>
<td>150</td>
<td>148</td>
<td>149b</td>
<td>149b</td>
</tr>
<tr>
<td>150 cm above the ground</td>
<td>145</td>
<td>144</td>
<td>141e</td>
<td>143d</td>
</tr>
<tr>
<td>Number of leaves per Branch</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (No Pruning)</td>
<td>28N5</td>
<td>28a</td>
<td>31NS</td>
<td>29Sd</td>
</tr>
<tr>
<td>16 cm above the ground</td>
<td>30</td>
<td>31cd</td>
<td>33</td>
<td>31Sd</td>
</tr>
<tr>
<td>30 cm above the ground</td>
<td>33</td>
<td>30cde</td>
<td>32</td>
<td>31Sd</td>
</tr>
<tr>
<td>60 cm above the ground</td>
<td>33</td>
<td>32cd</td>
<td>31</td>
<td>32Sd</td>
</tr>
<tr>
<td>90 cm above the ground</td>
<td>39</td>
<td>38a</td>
<td>36</td>
<td>37Sb</td>
</tr>
<tr>
<td>120 cm above the ground</td>
<td>37</td>
<td>36b</td>
<td>33</td>
<td>35Cde</td>
</tr>
<tr>
<td>150 cm above the ground</td>
<td>35</td>
<td>35bc</td>
<td>35</td>
<td>34Sd</td>
</tr>
</tbody>
</table>

Any two means in the column having common letter(s) are non-significant at 5% level.

Table 2: Effect of various levels of pruning on different aspects of Falsa

<table>
<thead>
<tr>
<th>Pruning Intensities</th>
<th>1993</th>
<th>1994</th>
<th>1995</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Fruit Clusters per Plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (No Pruning)</td>
<td>30e</td>
<td>25f</td>
<td>23f</td>
<td>26Sde</td>
</tr>
<tr>
<td>16 cm above the ground</td>
<td>33d</td>
<td>27e</td>
<td>26f</td>
<td>28Sde</td>
</tr>
<tr>
<td>30 cm above the ground</td>
<td>38cd</td>
<td>31e</td>
<td>30e</td>
<td>32Gd</td>
</tr>
<tr>
<td>60 cm above the ground</td>
<td>37d</td>
<td>40c</td>
<td>42c</td>
<td>39Sde</td>
</tr>
<tr>
<td>90 cm above the ground</td>
<td>83a</td>
<td>86a</td>
<td>87a</td>
<td>86Gde</td>
</tr>
<tr>
<td>120 cm above the ground</td>
<td>71b</td>
<td>65e</td>
<td>64b</td>
<td>66Sde</td>
</tr>
<tr>
<td>150 cm above the ground</td>
<td>38c</td>
<td>40c</td>
<td>38d</td>
<td>38Sde</td>
</tr>
<tr>
<td>Number of Fruits per Cluster</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (No Pruning)</td>
<td>11e</td>
<td>9e</td>
<td>07f</td>
<td>09e</td>
</tr>
<tr>
<td>16 cm above the ground</td>
<td>27c</td>
<td>28c</td>
<td>25c</td>
<td>27Sde</td>
</tr>
<tr>
<td>30 cm above the ground</td>
<td>18d</td>
<td>16e</td>
<td>21d</td>
<td>18Sde</td>
</tr>
<tr>
<td>60 cm above the ground</td>
<td>63b</td>
<td>42b</td>
<td>41b</td>
<td>46Sde</td>
</tr>
<tr>
<td>90 cm above the ground</td>
<td>60a</td>
<td>56a</td>
<td>62a</td>
<td>62Sde</td>
</tr>
<tr>
<td>120 cm above the ground</td>
<td>60b</td>
<td>42b</td>
<td>43b</td>
<td>43Sde</td>
</tr>
<tr>
<td>150 cm above the ground</td>
<td>17d</td>
<td>15d</td>
<td>13e</td>
<td>15Gde</td>
</tr>
<tr>
<td>Weight of Clusters (gm) per Plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (No Pruning)</td>
<td>05.26f</td>
<td>05.38a</td>
<td>05.42g</td>
<td>05.33s</td>
</tr>
<tr>
<td>16 cm above the ground</td>
<td>15.63c</td>
<td>20.18c</td>
<td>19.56c</td>
<td>19.19c</td>
</tr>
<tr>
<td>30 cm above the ground</td>
<td>12.53a</td>
<td>11.36a</td>
<td>17.86a</td>
<td>14.29d</td>
</tr>
<tr>
<td>60 cm above the ground</td>
<td>26.76b</td>
<td>30.27b</td>
<td>30.60c</td>
<td>29.94o</td>
</tr>
<tr>
<td>90 cm above the ground</td>
<td>43.52a</td>
<td>40.36a</td>
<td>44.22a</td>
<td>42.63a</td>
</tr>
<tr>
<td>120 cm above the ground</td>
<td>26.18b</td>
<td>30.87b</td>
<td>40.06b</td>
<td>33.57b</td>
</tr>
<tr>
<td>150 cm above the ground</td>
<td>11.70c</td>
<td>10.76b</td>
<td>06.26f</td>
<td>10.51de</td>
</tr>
<tr>
<td>Yield (kg) per Plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (No Pruning)</td>
<td>0.16g</td>
<td>0.16g</td>
<td>0.12g</td>
<td>0.15e</td>
</tr>
<tr>
<td>16 cm above the ground</td>
<td>0.16d</td>
<td>0.16a</td>
<td>0.45a</td>
<td>0.16d</td>
</tr>
<tr>
<td>30 cm above the ground</td>
<td>0.46e</td>
<td>0.36f</td>
<td>0.44f</td>
<td>0.45d</td>
</tr>
<tr>
<td>60 cm above the ground</td>
<td>1.64c</td>
<td>1.21c</td>
<td>1.29c</td>
<td>1.19c</td>
</tr>
<tr>
<td>90 cm above the ground</td>
<td>3.61a</td>
<td>3.43a</td>
<td>3.83a</td>
<td>3.64a</td>
</tr>
<tr>
<td>120 cm above the ground</td>
<td>2.07b</td>
<td>2.00b</td>
<td>2.68b</td>
<td>2.21b</td>
</tr>
<tr>
<td>150 cm above the ground</td>
<td>0.44f</td>
<td>0.43f</td>
<td>0.94f</td>
<td>0.40d</td>
</tr>
</tbody>
</table>

Any two means in the column having common letter(s) are non-significant at 5% level.

level above the ground whereas the minimum of 9.00 fruits per cluster were recorded in un-pruned trees. Similar results were observed by Myert and Ferrara (1953) who also observed that pruned trees produced more number of fruits per cluster than un-pruned trees in apples. Weight of cluster (gm) per plant: The data concerning the weight of cluster (gm) is shown in Table 2. The data on by
Ghaffar et al.: Levels of pruning in false

pruning at different levels. The maximum weight of cluster were weighed in the 90 cm pruning level above the ground whereas the minimum weight of 0.93 gm were recorded in un-pruned trees. These results are in agreement with those the findings of Steno and Barkat (1979) and Kolev et al. (1980) who resulted that the fruit weight was much greater in pruned trees than un-pruned trees in Peach.

Yield (kg) per plant: The ultimate aim of the research is to get the maximum yield. Highly significant results were obtained on the total yield as affected by different pruning levels. The highest yield of 3.62 kg per plant was obtained at a pruning level of 90 cm above the ground level, whereas the lowest yield of 0.16 kg per plant was observed on the un-pruned trees. Ghaffar and Rahman (1987) also reported that at a certain pruning level, i.e. 75 to 100 cm the yield of False per plant is highest as compared to the other levels of pruning or un-pruned trees.

References


