A COMPARISON OF THE MINIMUM PRUNING AND THE LOW SCAFFOLD TREE TRAINING SYSTEMS ON CHANDLER WALNUTS - 1999

Bill Olson and Nadeem Shawareb

ABSTRACT

In young Chandler orchards with vigorous growth, the low-scaffold training system can increase yields, but will not necessarily result in significantly larger trunk cross sectional areas. For each pruning system, Chandler yield was significantly larger for trees on paradox rootstock when compared to Chandlers on N.C. black rootstock.

OBJECTIVES

Many growers in Butte County have adapted or are considering adapting a training system developed by the Barton Family that reportedly increases early production as well as tree size. Although reports of higher production are commonplace from growers using the “low-scaffold” training system, many growers in Butte County have encouraged the authors to collect “scientific” data in a replicated trial on this training system. The objective of this trial is to collect yield and tree performance data in a replicated trial comparing this “low-scaffold” training system with the more traditional “minimum pruning” training system.

PROCEDURES

In a 1996 planting of vigorously growing June-budded Chandler walnut trees, a trial was established comparing low-scaffold training to minimum pruning training systems on both paradox and N.C. black walnut rootstock. Six, nine-tree replicates of these two training systems were established on paradox and N.C. black walnut rootstock. The first dormant season all trees were pruned the same way by heading them about 8-10 feet above ground and following standard procedures concerning neck buds, suckers, etc. The second dormant pruning is when the two systems differentiate. In summary, low-scaffold training keeps virtually all-horizontal scaffolds developing 3 or more feet above ground, removing only vertical or angled scaffolds that will interfere with the growth, non-vigorous growth (less than three feet long are left unheaded). The leader is also headed. The minimum pruning system removes all scaffold development below 5.5-6.0 feet above ground, chooses 4-6 “properly placed” scaffolds on the leader between 5.5 – 10 feet above ground, head them by 1/3 or more of current seasons growth and leaves undesirable or short growing scaffolds alone for early fruit production. The leader is also headed. Summer tipping of scaffold branches on the “low-scaffold” system is performed where needed until they reach a desirable size and shape. Eventually the low-scaffolds, below 5.5 feet, are removed once they lose vigor and begin to shade out. Dormant pruning in the 3rd and subsequent winters on minimally pruned trees consists of continued heading of desirable scaffold branches until they reach a desirable size. Some short, non-vigorous branches and undesirable scaffold branches are left unheaded.
Both yield measurements and trunk cross sectional area (TCSA) measurements were taken in 1999. Yield measurements are expressed as mean pounds of hulled, dried nuts per tree. TCSA measurements were calculated from 20 cm. above the graft union.

RESULTS

Chandler on paradox trained to the low-scaffold system had significantly higher yields than all other treatments at 24.8 pounds per tree (1190 lbs/a). Chandler on paradox trained to the minimal pruning system (16.4 lbs/tree or 787 lbs/a) was statistically similar to the Chandler on N.C. black trained to the low-scaffold system (13.5 lbs/tree or 648 lbs/a). Yield of minimum pruned Chandlers on N.C. black was significantly lower than all other treatments at 9.1 lbs. per tree (437 lbs/a), (Table 1).

Chandler on paradox trained to the minimal pruning system and Chandler on paradox trained to the low scaffold system had similar trunk cross sectional areas. Tree trunk size of Chandler on paradox and Chandler on N.C. black both trained to the low-scaffold pruning system were not significantly different from each other. Tree trunk size of Chandler on N.C. black was not significantly different for either of the pruning systems, (Table 1).

<table>
<thead>
<tr>
<th>Rootstock</th>
<th>Pruning System</th>
<th>Mean Yield (lbs/tree)</th>
<th>Mean Yield (lbs/acre)</th>
<th>Mean TCSA (cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>Low-Scaffold</td>
<td>24.8 a</td>
<td>1190 a</td>
<td>186.0 ab</td>
</tr>
<tr>
<td>Paradox</td>
<td>Minimum</td>
<td>16.4 b</td>
<td>787 b</td>
<td>187.5 a</td>
</tr>
<tr>
<td>N.C. black</td>
<td>Low-Scaffold</td>
<td>13.5 b</td>
<td>648 b</td>
<td>164.8 bc</td>
</tr>
<tr>
<td>N.C. black</td>
<td>Minimum</td>
<td>9.1 c</td>
<td>437 c</td>
<td>153.5 c</td>
</tr>
</tbody>
</table>

Treatment means not followed by a common letter are significantly different at the 5% level according to Duncan’s Multiple Range Test for Mean Separation.

CONCLUSIONS

In this young Chandler orchard with vigorous growth, the low scaffold training system increased yields, but did not result in significantly larger trunk cross sectional areas. For each pruning system, Chandler yield was significantly larger for trees on paradox rootstock when compared to Chandlers on N.C. black rootstock.