A COMPARISON OF THE MINIMUM PRUNING AND THE LOW SCAFFOLD TREE TRAINING SYSTEMS ON CHANDLER WALNUTS - 2000

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ABSTRACT

In a young Chandler orchard with vigorous growth, the low-scaffold training system increased yield and resulted in larger trunk cross sectional areas. Chandler trunk size was significantly larger for trees on paradox rootstock when compared to Chanders 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 and prunes (heads) back virtually all-horizontal scaffolds developing 3 or more feet above ground and removing only vertical or angled scaffolds that will interfere with tree growth. Non-vigorous growth less than three feet long is 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 2000. 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

There was no significant difference in yield between the two pruning systems on their respective rootstocks. There was a significant difference in yield between the trees on N.C. Black rootstocks and the trees on Paradox rootstocks. Accumulative yield was significantly better for trees low scaffold trained on paradox rootstock. (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 and significantly larger than both pruning systems on the N.C. Black rootstock. (Table 1).

Table 1: Performance of Chandelers Grown Under Two Different Pruning Regimes

<table>
<thead>
<tr>
<th>Rootstock</th>
<th>Pruning System</th>
<th>Mean Yield (lbs/Tree)*</th>
<th>Mean Yield (lbs/acre)*</th>
<th>Accumulated Yield (lbs/acre)*</th>
<th>Mean TCSA (cm²)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>Low-Scaffold</td>
<td>35.66 a</td>
<td>1711.68 a</td>
<td>2902.97 a</td>
<td>298.06 a</td>
</tr>
<tr>
<td>Paradox</td>
<td>Minimal</td>
<td>34.07 a</td>
<td>1635.36 a</td>
<td>2421.74 b</td>
<td>296.71 a</td>
</tr>
<tr>
<td>N.C. Black</td>
<td>Low Scaffold</td>
<td>31.65 ab</td>
<td>1519.20 ab</td>
<td>2168.42 b</td>
<td>249.10 b</td>
</tr>
<tr>
<td>N.C. Black</td>
<td>Minimal</td>
<td>27.08 b</td>
<td>1299.84 b</td>
<td>1735.58 c</td>
<td>235.25 b</td>
</tr>
</tbody>
</table>

*Treatment means not followed by a common letter are significantly different at the 5% level according to LSD Test for Mean Separation.
DISCUSSION

In this young Chandler orchard with vigorous growth, the low scaffold training system increased yields, however the increases were not statistically significant this year. Accumulative yields were significantly different. For each pruning system, trunk size was significantly larger for trees on paradox rootstock when compared to Chletters on N.C. black rootstock.