An Economic Analysis of Grafted Tomato Production under Different Planting Densities

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Background

- Vegetable grafting for soil-borne disease management and yield improvement
- High cost of grafted plants
- How can we reduce the cost of grafted vegetable production?

Grafting technology improvement to reduce the cost of grafted plants

Optimize the grafted vegetable production system and management

Can we decrease the plant population in field production while maintaining comparable yield or even improving yield (in comparison with non-grafted vegetable production) to lower the cost of using grafted plants?

Materials and Methods

- Split plot design:
  - Whole plots: spacing treatments
  - Subplots: Non-grafted and grafted tomato plants
- ANOVA, Fisher’s LSD test for yield comparisons
- Regression analysis to determine the relationship between yield and plant spacing

Objective

- Assess the yield performance of grafted tomato under different planting densities
- Examine the costs and returns of grafted tomato production as affected by planting density

Objectives

Results

- Marketable fruit yield and root-knot nematode damage

<table>
<thead>
<tr>
<th>Effect</th>
<th>P-value</th>
<th>Trt</th>
<th>lb/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graft</td>
<td>&lt;0.0001</td>
<td>Tribute</td>
<td>16960 c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tribute/MU</td>
<td>25279 a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tribute/RST</td>
<td>20869 b</td>
</tr>
<tr>
<td>Spacing</td>
<td>0.319</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graft x Spacing</td>
<td>0.379</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Relationship between spacing and marketable yield (lb/acre)

- Relationship between spacing and partial net return ($/acre)

- Transplant number and cost ($/acre) at different yield levels

Materials and Methods Table:

<table>
<thead>
<tr>
<th>In-row spacing (ft)</th>
<th>In-row spacing (m)</th>
<th>Plants per acre</th>
<th>Plants per ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>0.46</td>
<td>4840</td>
<td>11960</td>
</tr>
<tr>
<td>2.0</td>
<td>0.61</td>
<td>3630</td>
<td>8970</td>
</tr>
<tr>
<td>2.5</td>
<td>0.76</td>
<td>2904</td>
<td>7176</td>
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<tr>
<td>3.0</td>
<td>0.91</td>
<td>2420</td>
<td>5980</td>
</tr>
<tr>
<td>3.5</td>
<td>1.07</td>
<td>2074</td>
<td>5126</td>
</tr>
</tbody>
</table>

- Constant between-row spacing 1.83 m (6 ft)
- Fall 2013 study in certified organic field, Citra, FL

- Determine tomato ‘Tribute’ grafted onto ‘Multifort’ (MU) or ‘RST-04-106-T’ (RST), non-grafted ‘Tribute’ as control

Acknowledgments:
