Introduction

The Root Trainer technique of propagation, which was perfected by the Rubber Research of India, has been adapted for the conditions of Central America, thanks to the support of Dr. R. K. Matthan and Mr. Joseph John from India.
Where is Guatemala? It straddles the Central American Isthmus between South and North America with Mexico on the North and Honduras and El Salvador to the South. It has seaport access to both the Pacific and the Atlantic.
Rubber Plantation Areas

- Traditional
- Non-Traditional

Root Trainer Container

- Imported from India
- 800 cc containers
Growth Medium

- Generally used in India is Coir Pith
- Since coir pith is not available in Guatemala, it was decided to use Peat Moss
- Root Trainer container filled tightly with the potting mixture
- Special attention was required for tight filling especially at the 1/4th bottom of the container as this region is highly vulnerable to breakage

Coir Pith
Peat Moss

Placement of the Root Trainers

Root Trainers were placed in the soil and on stands
Compaction of the bottom peat moss with soil and water stagnation was noticed while irrigating.
Use of stands for placing the root trainer containers

Lower half of the container was covered with top soil
Planting Root Trainers

Irrigation
Fertilizing

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Sulphate</td>
<td>49.5 parts</td>
</tr>
<tr>
<td>Rock Phosphate (29%)</td>
<td>34.5 parts</td>
</tr>
<tr>
<td>Muriate of Potash</td>
<td>7.0 parts</td>
</tr>
<tr>
<td>Magnesium Sulphate</td>
<td>10.0 parts</td>
</tr>
</tbody>
</table>
Fertilizing

Pest and Diseases
Root Trainer Stands and Stacking

Root Trainer Stands and Stacking
Budding

• Process by which the plants are conditioned to withstand the adverse conditions in the field
• Plants with 2 whorls are removed from the soil
• 4 to 8 weeks for hardening
• Air pruning of the tap root will result in a stress in the plant responding by producing large number of lateral roots
• Vertical ridges will direct these roots downwards preventing circular growth within the container
• Root system with a central tap root and large number of lateral roots with proper orientation
• Resume a quick and vigorous growth on transplanting to the soil

Hardening
Hardening

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Poly bag root system

Root Trainer root system
Transplanting to the Field

Cost Calculation

<table>
<thead>
<tr>
<th>Particulars for 1000 plants</th>
<th>Polybag (USD)</th>
<th>RT* (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of container</td>
<td>55.00</td>
<td>55.00</td>
</tr>
<tr>
<td>Extraction and transport to vehicle</td>
<td>0.22</td>
<td>0.04</td>
</tr>
<tr>
<td>Unloading, distribution and planting</td>
<td>166.67</td>
<td>50.00</td>
</tr>
<tr>
<td>Vehicle hire</td>
<td>126.58</td>
<td>40.51</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>348.47</strong></td>
<td><strong>145.55</strong></td>
</tr>
<tr>
<td>Cost per plant</td>
<td>0.348</td>
<td>0.145</td>
</tr>
<tr>
<td>Saving per plant</td>
<td>0.20</td>
<td></td>
</tr>
</tbody>
</table>

*Assuming that RT Container is reused for 10 years and all other upkeep expenses are same as polybag plants*
Transplanting to the Field

Conclusion

• Root Trainer plants will grow deep into the soil
• Better anchorage and wins fastness to the tree
• The large number of lateral roots ensures better growth of the plants on transplanting to the field
• Better uniformity on growth
• 100% establishment success on transplanting to the field
• Savings on costs production
Conclusion

• Cost of transportation, distribution and planting are considerably less compared to the poly bag plants
• Half the space than a poly bag nursery takes
• Root Trainers containers and stands are reusable
• No use of top soil for filling poly bags
• Root Trainer plants are cost effective and ensure even growth of the plant in the field

Acknowledgements

• A novel planting technique for hevea
  Dr. T A Soman, Dr. Y Annamma Varghese and Dr. James Jacob
• Root trainer plants an alternative planting technique for hevea
  Dr. T A Soman, Dr. Kavitha K Mydin and Dr. James Jacob
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