Grafting
And Budding
Agenda

• Introduction, Purpose & Timing
• Grafting Terms
• How a graft works
• Tools used
• Type of Grafts & Techniques
• Types of Budding & Techniques
• Fun with Grafting
Grafting and budding are methods of asexual plant propagation that join parts from two different plants so they will grow as one plant.
Why do we Graft?

- Propagate where other methods will not work
- Obtain benefits of the stock material
  
<table>
<thead>
<tr>
<th>Variety</th>
<th>Success Rate</th>
<th>Height</th>
</tr>
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<tbody>
<tr>
<td>M-9</td>
<td>40%</td>
<td>10ft</td>
</tr>
<tr>
<td>EMLA-7</td>
<td>60%</td>
<td>15ft</td>
</tr>
<tr>
<td>EMLA-111</td>
<td>80%</td>
<td>20ft</td>
</tr>
</tbody>
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- Change cultivar on established plant
- Repair damage tree parts
- Faster production of new fruit 2/3 vs 5/7 years
- Novelties – more than one cultivar on one tree
Grafting Terms

- **Grafting**: Joining two plant pieces to make one plant
- **Scion**: Detached shoot from last year’s growth with dormant buds, upper graft part.
- **Stock**: Basal part of the graft (understock or rootstock)
- **Interstock**: Stem pieces added between stock & scion
- **Cambium**: This is a single layer of cells between the wood and bark. It must be lined up for a good graft union.
Steps in Healing

- Tissues involved are the Xylem, Phloem and Cambium

- Callus from stock & scion fill the space and interlock to form “callusbridge”

- Callus cells in line between stock & scion cambium change into cambium cells

- New cambium produce Xylem & Phloem in wound to establish a vascular connection.
Tissues involved in graft union
Steps in Healing

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- Callus from stock & scion fill the space and interlock to form “callusbridge”

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Tools Used

- Budding Knife / Grafting Knife
- Fine tooth saw
- Pruning shears
- Tying Materials: tape, rubber strips
- Wax
- A cleft-grafting chisel or small hatchet/heavy knife
Simple Grafting

- scion
- stock
Grafting Machine
Stages in Whip Grafting

A1. Original tree
A2. Cut off the top
B. Cut the scion and stock
C. Match the cuts
D1. Insert the scion
D2. Secure with twine
Grafts of Different Diameters

A. Scion
B. Stock
C. Tree with graft
D. Tree with graft, sealed
Stages in Cleft Gafting

A1.

A2.

B.

C.

D.

scion

stock
Side Graft Technique

1. Cut the scion and stock at an angle.
2. Insert the scion into the stock.
3. Secure the graft with a grafting union or tape.
Approach Graft

A. Cutting the branches
B. Inserting the graft
C. Securing the graft with a string
Bridge Grafting

A. Cutting the bark of the host tree.

B. Attaching the scion to the host tree.
Bud Grafting

A. 
B. 
C. 
D. 
E. 
F.
Chip Budding
Grafting and Budding Notes

- Cambial layers of stock and scion must meet
- Parts must be held securely
- Keep air out!
- Union heals by callus production
- Adequate temperature for cell division
- There are limitations!
Figure 24. Photosynthesis, respiration, leaf water exchange, and translocation of sugar (photosynthate) in a plant.
Questions?

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