Grafting of Fruiting Vegetables

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Tube Grafting

Scion

Rootstock
PRACTICE: Grafting of vegetable crops: Translating international knowledge and experience and adapting it to local systems of production.

SCIENCE: Understanding the mechanisms –
• population structure and dynamics of pathogens
• host genetics – QTL mapping
• plant physiology – cool storage
• IPM/farming systems research

OUTCOMES HAVE: Direct and Indirect Benefits
The Practice can direct the Science and the Science can inform the Practice.
Early 20th century: Japan included the use of *Cucurbita moschata* to confer fusarium wilt resistance in watermelon production (Oda, 2002; Sakata et al. 2007; Sakata et al. 2008).

**Benefits:** 100+ years of modern grafting


Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org

Jason Brock, University of Georgia, Bugwood.org
Diversity of Fruiting Vegetable Production Systems:
Regional importance of various soilborne tomato pathogens in North Carolina

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Coastal Plain</th>
<th>Piedmont</th>
<th>Mountains</th>
<th>Graft Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verticillium dahliae race 1</td>
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</tr>
<tr>
<td>Verticillium dahliae race 2</td>
<td>----</td>
<td>*</td>
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<tr>
<td>Fus. oxy. f.sp. lycopersici race 0 or 1</td>
<td>****</td>
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<tr>
<td>Fus. oxy. f.sp. lycopersici race 2</td>
<td>*</td>
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</tr>
<tr>
<td>Ralstonia solanacearum (race 1)</td>
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<tr>
<td>Sclerotium rolfsii</td>
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<tr>
<td>Phytophthora capsici</td>
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<tr>
<td>Meloidogyne incognita</td>
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</tbody>
</table>

Louws et al. 2010
TO GRAFT  OR NOT  TO GRAFT
Yield 2013 Jackson co.
Main effects:
801 vs 802 NS
Not pinched (7.1%) vs pinched (0.4%) $P=0.006$
Interactions = NS

Bacterial wilt incidence (%)
Yield per plant (lbs)

<table>
<thead>
<tr>
<th>rootstock</th>
<th>training</th>
<th>spacing (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>801</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>802</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Not Pinched</td>
<td>Pinched</td>
<td>30</td>
</tr>
</tbody>
</table>

P = 0.01

Y = 0.34X; R^2 = 0.987

14.3%

30+%
Advancing grafting in the USA requires an interdisciplinary team of people
GOAL: To engage industry leaders to enhance the exchange of ideas; discuss challenges and opportunities; facilitate business relationships

Nov 8 2012
Florida

Nov 6, 2013
San Diego

Linked to Advisory meeting
USDA SCRI CONTACTS

Partners – (Third Party Match)

53 private partners representing the global diversity of the industry including:

- Multiple farmers throughout the US (OFR)
- Grower Associations
- Automation/Robotics companies
- Seed companies (especially rootstock seeds)
- Propagators/transplant growers
- Consultants & other Stakeholders

Expand or create profitable business opportunities
Fair 85 (Fatty alcohol)