Current Status of Plum and Grape Tomato Breeding at NC State University

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Plum tomatoes

- Plum Regal, and
- NC 06113 (Synergia?)
Plum regal

- Plum regal is the latest hybrid developed from NC 25P and NC 30P, released in 2008.
- It has determinate growth habit with heavy foliage.
- Intermediate fruit size.
Pedigree of Plum regal

NC 05255 ‘Plum Regal’

034(x)-37-1-4-1
NC 30P

Amelia(x)-144-1B-1A

NC ERB-7

01541(x)-1-1-3W-1
NC 25P

NC EBR-7 sister line

9972-2A(x)-33-139-1

630-1(95)-Bk-Bk

9722(X)-26

215E-1(93)

23E-2(93)

96248

L3707
NC 30P

Moderately resistant to EB and resistant to FW (l, l-2), TSWV, VW. Elongated bright red fruits are ~125 g

Plum Regal

Resistant to EB, LB (Ph-3), FW (l, l-2), VW, and tolerant to BS. Round red fruits are ~113 g
Heavy foliage
Jointless pedicel

NC 25P

Bright red fruits
Medium firm
Resistant to Cracking and graywall
Determinate (sp) growth habit
Jointless (j2) pedicel
Segregating for ms-10 aa
Elongated fruits
'Plum Regal'

Resistant to TSWV, EB, LB
Bacterial spot tolerant
Plum Regal - Resistant

Bacterial Spot

Plum Crimson Susceptible
Plum regal

- Resistant to TSWV, Late blight (*Ph-3*): improvement over Plum Crimson
- Pin-pointed blossom end, bright red fruit color (crimson gene) with jointless pedicel
- Resistant to Graywall
NC 946: A parent of NC 06113

- Co-developed from NC 946 x CULBPT
- NC 946 has VW (Ve), FW (I, I-2 and I-3), TSWV (Sw-5) resistance
- Moderate resistance to EB
Pedigree of NC 946

NC EBR-7

034(x)-71-1-11-1-Bk
NC 946

Amelia(x)-144-1B-1A
NC 946

- Determinate growth habit
- Elongated fruits are dark red due to crimson gene and medium firmness
- Jointless pedicel
- Fruits are highly resistant to Graywall and cracking
- Fruit size is 108 g
Grape tomato

- Developing hybrids with superior fruit quality
- Multiple disease resistance, and
- Improved plant growth habit
Compact, indeterminate growth habit with *br* gene
Very sweet flavor derived from the 'Santa', fruit size ~10 g, *j2, u* genes
Resistant to EB derived from NC EBR-6
NC 2 grape
Indeterminate, br, rin
Very sweet
Compact, determinate growth habit, $j_2$, $u$ genes
Segregating for $ms-10$, $aa$ genes
Moderately resistant to EB derived from NC EBR-6
*ms-10* aa in brachytic, indeterminate background
Mountain magic

- F1 released in 2008, indeterminate with fairly compact growth habit
- Also resistant to FW (I, I-2) and VW
- Resistant to weather check, cracking and bursting
- Campari type fruits with *rin* and *crimson* gene
- Jointed pedicel
Mountain magic
Resistant to EB, LB
Long shelf life
Excellent flavor
NC 07310 hybrid

NC 0579(x)-43-2: rin gene, high sugar, resistant to EB, TSWV, FW (races 1-3), BS
NC 0579(x)-43-2
l-3 + Sw-5 line

NC 051-66
Male sterile
NC 07310
Resistant to FW race 3 + TSWV
Segregating for *rin*
### Descriptive statistics for TSS

<table>
<thead>
<tr>
<th>Genotype/Population</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>StdDev</th>
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<tbody>
<tr>
<td>NC 2 Grape</td>
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<td><strong>NC 08135</strong></td>
<td>8.3</td>
<td>7.4</td>
<td>8.9</td>
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<td>860-1A(2008)</td>
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<td>Local Grape</td>
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<td>0.6</td>
</tr>
</tbody>
</table>
Next grape hybrids?

Sw-5/I-3 (NC 07310) x ELBR (NC 08135)

F1
(with high sugars and good flavor)
Organic acid content

![Bar chart showing organic acid content for different varieties.](image)
Sugar content

![Bar graph showing sugar content of different varieties of potatoes. The graph compares Fructose, Glucose, and Total sugar concentrations for Mr. Swpey, NC 118L, Mountain Magic, NC 161L, Stupice, and Red Brandywine.](image)
Organic acid content

![Bar chart showing organic acid content comparison between different methods. The x-axis represents the methods: Organic, Brandt, Conventional, Control. The y-axis represents concentration (mM/g).]
Sugar content

![Graph showing sugar content comparison between Brandt, Organic, Control, and Conventional methods. The y-axis represents concentration (g/g), and the x-axis represents the four methods. The graph indicates lower sugar content in Organic and Conventional methods compared to Brandt and Control.](image.png)
Questions?