What Are We Looking For In the Next Rootstock?

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Available Cherry Rootstocks

Currently Used in PNW
• Mazzard
• Gisela 6, 12
• Krymsk 5 & 6
• MaxMa 14

Also Available Now or Soon
• Colt, Mahaleb
• Gisela 3, 5, 13, 17
• Weigi 1, 2, 3
• Clinton, Lake, Cass, Crawford, Clare
• CAB-6P
• MaxMa 60
Relative Rootstock Size

What Traits are We Looking For?

1. Increase productivity of Early Robin, Regina, etc. Consistent 10 tons/acre
2. Provide precocity while moderating oversetting potential of Chelan, Sweetheart, Lapins.
3. Rootstocks like apples, good precocity (similar to Gi5), but more forgiving. Consistently good fruit set, without affecting fruit size.
4. Two vigor levels: 1) Precocity with vigor 2) Precocity with size control
5. Precocious, size controlling rootstocks that perform well in poorer soils
6. Disease resistance – bacterial canker
1. Increase productivity of Early Robin, Regina, etc. Consistent 10 tons/acre

The Dalles – ‘R’ (steep leader), ‘SH’ (KGB)

With both cultivars, the highest tree yields were obtained with Gi5 & Gi6. However, projected per acre yields tended to level out based on different tree spacings1.

<table>
<thead>
<tr>
<th>Rootstock selection</th>
<th>Regina</th>
<th>Sweetheart</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tree yield (lb)</td>
<td>Tons per acre</td>
</tr>
<tr>
<td>Gi5</td>
<td>23.8 ab2</td>
<td>7.4 a</td>
</tr>
<tr>
<td>Gi6</td>
<td>30.1 a</td>
<td>9.4 a</td>
</tr>
<tr>
<td>K6/K5</td>
<td>22.2 ab</td>
<td>6.9 a</td>
</tr>
<tr>
<td>CASS</td>
<td>23.6 ab</td>
<td>9.2 a</td>
</tr>
<tr>
<td>CLARE</td>
<td>13.6 b</td>
<td>5.3 a</td>
</tr>
<tr>
<td>CLINTON</td>
<td>22.7 ab</td>
<td>8.8 a</td>
</tr>
<tr>
<td>LAKE</td>
<td>15.0 b</td>
<td>5.9 a</td>
</tr>
</tbody>
</table>

1519 trees/acre (6 ft x 14 ft) for K5; 622 trees/acre (5 ft x 14 ft) for K6, Gi5 and Gi6, and 778 trees/acre (4 ft x 14 ft) for Clare, Cass, Clinton and Lake.

2Means that are significantly different (P < 0.05) are denoted by different letters.
2. Provide precocity while moderating oversetting potential of Chelan, Sweetheart, Lapins.

**Sweetheart (3rd – 5th Leaf) Yield/Tree The Dalles**

- **Yield/Tree (kg)**
  - Maz
  - G6
  - K5
  - K6

**Sweetheart average per tree yield and fruit size – The Dalles**

- **Avg Tons/Acre 5-7 Leaf**
- **Avg Fruit Size (mm)**
  - Mazzard
  - MM14
  - G6
  - K5
3. Rootstocks like apples, good precocity (similar to Gi5), but more forgiving. Consistently good fruit set, without affecting fruit size

**Weigi 1, 2, 3**
- Total of 5 rootstocks
- Weirroot x Gisela
- Peter Stoppel
- Weigi 1, 2, 3
- Marketed in U.S. by Tree Connection

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**Relative Tree Size at La Tapy France**

![Graph showing trunk cross-sectional area (cm²) for Gisela, Weigi 1, Weigi 2, and Weigi 3, with Regina and Skeena colors distinguished.]
4. Two Tree Vigor Levels

**Precocity with vigor**
- Gisela 6 and 12
- Gisela 13 & 17
- Krymsk 5 & 6
- Weigi 1 and 3
- MaxMa 14

**Precocity with size control**
- Clinton, Lake, Cass, Crawford, Clare
- Weigi 2
Trunk cross-sectional area of ‘Bing’ trees grafted on 5 MSU rootstock and Gi5 and Gi6 controls planted in 2009 at WSU-Prosser.

A. Iezzoni & T. Auvil

1Means that are significantly different for 2013 TCSA (P < 0.05) are denoted by different letters.

TCSA - E. Robin, Regina, Sweetheart

A. Iezzoni, B. Solata & L. Long
5. Precocious, size controlling rootstocks that perform well in poorer soils

**Gisela 13**
- Similar size to Gi6
- Flat branch angles
- No suckering
- Precocious
- Same parentage as Gi 5&6
- In 4 trials yields after 6-13 years similar or > Gi5
- “High yields & good quality under less favorable conditions”

![Gisela 13 image]

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**Year 7 TCSA Witzenhausen, Germany**

![Year 7 TCSA chart]

<table>
<thead>
<tr>
<th>TCSA (cm²)</th>
<th>Gi 5</th>
<th>Gi 12</th>
<th>Gi 13</th>
<th>Gi 6</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>50</td>
<td>70</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>100</td>
<td></td>
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</tbody>
</table>
5. Precocious, size controlling rootstocks that perform well in poorer soils

**Gisela 17**
- Most vigorous of all Giselas
  - 70-80% F-12/1 Mazzard
  - Much more precocious
  - Compared to MxM14
- *Prunus canescens x P. avium*
- Less potential for overcropping than Gi 5 or 6
- Combine with more productive cultivars
- “Less demanding of soil, climatic and cultural conditions than Gi5”

Photo by Nicola Dallabetta, EMF
Bing - TCSA

Prosser, WA – Year 9

Summerland, BC – Year 7

Bing Yield – 3-7 Leaf

Prosser Bing

Corvallis Bing
6. Disease Resistance

Bacterial Canker Severity of Bing on Four Rootstocks

<table>
<thead>
<tr>
<th>Rootstock</th>
<th>Head Cut 07</th>
<th>Score Cut 08</th>
<th>Shoot Cut 08</th>
<th>Dead (%) 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gisela 6</td>
<td>19b</td>
<td>8a</td>
<td>4a</td>
<td>90c</td>
</tr>
<tr>
<td>Mazzard</td>
<td>17b</td>
<td>19b</td>
<td>6a</td>
<td>50b</td>
</tr>
<tr>
<td>Colt</td>
<td>7a</td>
<td>17b</td>
<td>8b</td>
<td>0a</td>
</tr>
<tr>
<td>Krymsk 5</td>
<td>5a</td>
<td>13b</td>
<td>4a</td>
<td>43b</td>
</tr>
</tbody>
</table>

- Colt shows greatest resistance of all rootstocks but not precocious
- K5 provides precocity and a low rate of heading cut susceptibility and moderate mortality similar to Mazzard

Data by R. Spotts, OSU
What Traits are We Looking For?

• Increase productivity of Early Robin, Regina, etc. Consistent 10 tons/acre – Corette Series?
• Provide precocity while moderating oversetting potential of Chelan, Sweetheart, Lapins – K5 & 6, MxM14
• Rootstocks like apples, good precocity (similar to Gi5), but more forgiving. Consistently good fruit set, without affecting fruit size – Weigi 1, 2, 3?
• Two vigor levels: 1) Precocity with vigor – Many options, 2) Precocity with size control – Weigi 2, Corette Series?
• Precocious, size controlling rootstocks that perform well in poorer soils – Gisela 13 & 17?
• Disease resistance – bacterial canker - ???