Brief review of the North-Eastern Hungarian sour cherry breeding

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Research tradition and activities of sour cherry production in the Hungarian North-Plain Region
Main activities in the Újfehértó Research Station of NARIC Fruitculture Research Institute

- **Research**
  - Breeding new fruit varieties (mainly sour cherries and apples)
  - Improving orchard management practices
  - Improving postharvest techniques

- **Maintaining horticultural genebank collection**
  - more than 2000 items

- **Advisory service**
  - Advice on cultivar usage
  - Orchard management
  - Plant protection

- **Laboratory services**
  - Fruit and soil analyses
Germplasm maintenance

- 1344 cultivars
- 424 cultivars
- 91 cultivars
- 79 cultivars
- 76 cultivars
- 32 cultivars
- 55 cultivars
- 12 cultivars
Sour cherry breeding nowadays

Prof. Tibor Szabó

Mr. Ferenc Szőke private breeder
The objective of the regional clone selection work

- To find new types of the sour cherry trees which were self-fertile,
- Can be harvested with a dry abscission layer,
- Have rich and high quality yield
- Have different harvest time
Area of the sour cherry selection

I. Újfehértói fürtös, 1970,1978
II. Debereceni bőtermő, 1986
III. Kántorjánosi 3, 1994
IV. Éva, Petri fj.
Újfehértói fürtös
Debreceni bőtermő
Kántorjánosi
3
Petri (R)
Éva (T)
# Properties of the main varieties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Újfehértói fürtös</th>
<th>Éva</th>
<th>Petri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self fertility (%)</td>
<td>4,97</td>
<td>4,3</td>
<td>11,5</td>
</tr>
<tr>
<td>Open pollination (%)</td>
<td>24,47</td>
<td>21,77</td>
<td>27,9</td>
</tr>
<tr>
<td>Specific yield (kg/canopy m³)</td>
<td>1,39</td>
<td>1,65</td>
<td>1,77</td>
</tr>
<tr>
<td>Weight of 100 fruits (g)</td>
<td>528,5</td>
<td>538,5</td>
<td>529,8</td>
</tr>
<tr>
<td>Stipule occurrence on the stalk (%)</td>
<td>60,8</td>
<td>48,8</td>
<td>60,8</td>
</tr>
<tr>
<td>Number of bearing wood on 1 metre twig (pcs/m)</td>
<td>5,07</td>
<td>5,41</td>
<td>15,81</td>
</tr>
<tr>
<td>Susceptibility to cracking</td>
<td>Medium susceptibility</td>
<td>Slightly susceptible</td>
<td>Slightly susceptible</td>
</tr>
<tr>
<td>Panel test results (over all impression)</td>
<td>5,0</td>
<td>6,4</td>
<td>6,2</td>
</tr>
</tbody>
</table>
L

- Origin from Lövőpetri,
- **Parents**: Érdi bőtermő x unknown regional clone
- **Ripening time**: 15-20 of June

N-2

- Origin from Nyírtass,
- **Parents**: Maliga x unknown regional clone
- **Ripening time**: 18-22 of June

M

- Origin from Lövőpetri,
- **Parents**: unknown,
- **Ripening time**: 24-26 of June, after 2 days
- Debreceni bőtermő
We can conclude that the regional clone selection was successful.

- The new varieties are self-fertile types with high yield,
- Can be harvested with shaker machine with a dry abscission layer,
- These varieties are suitable both for fresh consumption and industrial processing
- More than half of the plantations in the last 20 years were done with these types
New goals for the selection

- Aim to supply **exclusive varieties (super fruit)** for growers and customers for the future to increase fresh consumption

- We have to find new varieties to extend ripening period and sour cherry season

- We are interested in that promising sour cherry types which has a high level of phytonutrients and antioxidant to use them as a functional food, because healthier eating became one of the top food trends among consumers

- Reduce the number of chemical applications – new resistant varieties

- We examin sour cherry varieties on some other aspects i.e. post-harvest technologies
Antioxidant capacity of sour cherry varieties
Flavonoidok

Antocianinok

Újfehértó, 2014
### Fruit properties of resistant sour cherry clones (Pallag-Újfehértó, 2014)

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Diameter x (mm)</th>
<th>Width y (mm)</th>
<th>Height z (mm)</th>
<th>Fruit weight (g)</th>
<th>Weight of stone (g)</th>
<th>Ratio of stone (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VN-1</td>
<td>20.04</td>
<td>17.61</td>
<td>17.76</td>
<td>4.31</td>
<td>0.28</td>
<td>7.03</td>
</tr>
<tr>
<td>VN-4</td>
<td>20.06</td>
<td>18.33</td>
<td>19.10</td>
<td>4.73</td>
<td>0.35</td>
<td>8.03</td>
</tr>
<tr>
<td>VN-7</td>
<td>20.46</td>
<td>17.66</td>
<td>17.89</td>
<td>4.52</td>
<td>0.28</td>
<td>6.55</td>
</tr>
<tr>
<td>Csengődi</td>
<td>20.72</td>
<td>18.58</td>
<td>20.38</td>
<td>5.27</td>
<td>0.35</td>
<td>7.11</td>
</tr>
<tr>
<td>Csengődi 4</td>
<td>21.62</td>
<td>18.58</td>
<td>18.98</td>
<td>5.10</td>
<td>0.27</td>
<td>5.52</td>
</tr>
<tr>
<td>Horkai</td>
<td>21.93</td>
<td>18.85</td>
<td>19.14</td>
<td>5.29</td>
<td>0.25</td>
<td>4.96</td>
</tr>
<tr>
<td>Csengődi 1</td>
<td>21.93</td>
<td>18.82</td>
<td>19.32</td>
<td>5.19</td>
<td>0.30</td>
<td>6.13</td>
</tr>
<tr>
<td>Csengődi 12</td>
<td>22.66</td>
<td>18.97</td>
<td>19.65</td>
<td>5.56</td>
<td>0.24</td>
<td>4.59</td>
</tr>
<tr>
<td>Csengődi 2</td>
<td>22.98</td>
<td>19.49</td>
<td>19.88</td>
<td>5.90</td>
<td>0.28</td>
<td>4.99</td>
</tr>
<tr>
<td>Csengődi 8</td>
<td>23.00</td>
<td>19.45</td>
<td>20.07</td>
<td>5.96</td>
<td>0.29</td>
<td>5.02</td>
</tr>
</tbody>
</table>
## Characteristic of stems of resistant sour cherry clones (Pallag-Újfehértó, 2014)

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Length of stem (mm)</th>
<th>Stem detachment force (N/mm²)</th>
<th>Ratio of stems with stipule (%)</th>
<th>Average number of stipules per stem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Csengődi 2</td>
<td>45.90</td>
<td>706.45</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>VN-7</td>
<td>46.29</td>
<td>227.48</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Csengődi 12</td>
<td>47.68</td>
<td>773.38</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Csengődi 4</td>
<td>47.82</td>
<td>741.72</td>
<td>26.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Csengődi 8</td>
<td>48.39</td>
<td>648.84</td>
<td>23.3</td>
<td>1</td>
</tr>
<tr>
<td>VN-1</td>
<td>50.85</td>
<td>358.46</td>
<td>20</td>
<td>0.5</td>
</tr>
<tr>
<td>Csengődi 1</td>
<td>52.18</td>
<td>798.60</td>
<td>6.7</td>
<td>1</td>
</tr>
<tr>
<td>VN-4</td>
<td>53.80</td>
<td>439.53</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Csengődi</td>
<td>54.58</td>
<td>312.70</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Horkai</td>
<td>58.99</td>
<td>392.86</td>
<td>12</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Average fruit size: 21-23 mm,
Good taste and high level of antioxidant
Ripening time: 10-12. of June
Yield is not too much
Resistant against cherry leaf spot
Average fruit size: 22-24 mm,

Ripening time: **16-23. of June**

Fruit colour: dark carmine red,

Average fruit size: 21-23 mm,

Ripening time: **18-25. of June**
Horkai

Selected in Serbia
Ripening time: 5-10th of June
Fruit colour: dark carmine red, juice is painter
High acid and sugar content
Great taste
Examination of sour cherry storage

The optimum storage conditions for cherries depend on variety, harvest time, region, orchard location, etc. We have some experiment to know behavior of our varieties under different storage conditions to extend their selflife.
Thank you for your attention!

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