Improvement of organic sweet cherry production in Austria

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Introduction – research questions

- Is organic cherry production in Austria practicable?
  - Control of pests (cherry fruit fly, aphids, …) and diseases (leaf diseases, Monilia fruit rot, …)
  - Which cultivars are suitable?
  - Fruit quality?
Cultivar trial

- Research orchard of BOKU, organically managed
- 12 mainly early mature cv. with 8 replications
- planted in autumn 2003
- rootstock Gisela5®
- 2,5m x 4m
- spindle
Ranking of cultivars

- Bigarreau Burlat (Schreiber)
- Merchant
- Bigarreau Moreau
- Hybrid 222
- Merton Premier
- Burlat (VG)
- Early Lory
- Schachl
- Valeska
- Marzer Kirsche
- Langstielige
- Sweetheart
Organic production with later ripening cultivars?
Cherry aphid (Myzus prunium, M. cerasi)
Why fruit thinning?

- Enhancing fruit quality (fruit size, . . .)
- Less Monilia (flower and fruit rot)
- . . .
Mechanical thinning of flowers (2010 - 2012)

Electroflor (Effleureuse)
Fruit thinning with Effleureuse
during full blossom (BBCH 65)
~ 40% of the flowers removed
Results: Attack with Monilinia laxa on flowers (2 weeks after full blossom, May 2010)

% infested flowers

Monilinia laxa (may 2010)

* = ANOVA (GLM), different letters show significance (P<0.05)
Trial with flower treatments (2010)

mechanical variants:
• Electroflor (April 11\textsuperscript{th})
• Removing of young cherries with scissors = hand thinning (6\textsuperscript{th} May)

spraying variants (April 11\textsuperscript{th}, April 16\textsuperscript{th}):
• wettable sulphur (4%)
• lime sulphur (3%)
• IP- standard ATS (1.8%)
Research orchard B (2010)
## Results

Fruit setting, yield and flower infestation with *M. laxa* in 2010 in orchard B (mean ‘Blaze Star’ and ‘Merchant’)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Hand thinning (fruits)</th>
<th>Electro-flor</th>
<th>ATS</th>
<th>Sulphur</th>
<th>Lime sulphur</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvested Fruits (total)</td>
<td>35 ± 15,9</td>
<td>27 ± 9,4</td>
<td>19 ± 8,3</td>
<td>29 ± 11,0</td>
<td>45 ± 16,8</td>
<td>32 ± 12,3</td>
<td>0,000&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>[Fruits from 100 flowers]</td>
<td>c</td>
<td>abc</td>
<td>a</td>
<td>bc</td>
<td>d</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>Fruit setting (total) [% of control]</td>
<td>100,0</td>
<td>76,0</td>
<td>53,1</td>
<td>82,4</td>
<td>128,0</td>
<td>89,3</td>
<td></td>
</tr>
<tr>
<td>Marketable fruits</td>
<td>27 ± 14,4</td>
<td>20 ± 10,2</td>
<td>13 ± 7,7</td>
<td>23 ± 12,9</td>
<td>37 ± 16,6</td>
<td>22 ± 11,8</td>
<td>0,000&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>[Fruits from 100 flowers]</td>
<td>b</td>
<td>b</td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>b</td>
<td></td>
</tr>
<tr>
<td>Not marketable fruits</td>
<td>8 ± 5,4</td>
<td>7 ± 4,0</td>
<td>6 ± 4,4</td>
<td>6 ± 5,4</td>
<td>9 ± 5,9</td>
<td>10 ± 7,9</td>
<td>0,075&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>[Fruits from 100 flowers]</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Marketable yield [g/branch, 100 flowers]</td>
<td>144 ± 63</td>
<td>126 ± 57</td>
<td>88 ± 50</td>
<td>134 ± 57</td>
<td>176 ± 62</td>
<td>139 ± 69</td>
<td>0,000&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>[Fruits from 100 flowers]</td>
<td>bc</td>
<td>b</td>
<td>a</td>
<td>bc</td>
<td>c</td>
<td>bc</td>
<td></td>
</tr>
<tr>
<td>Marketable yield [% of control]</td>
<td>100,0</td>
<td>87,5</td>
<td>61,1</td>
<td>93,1</td>
<td>122,2</td>
<td>96,5</td>
<td></td>
</tr>
<tr>
<td>Ø Fruit weight [g/fruit]</td>
<td>5,6 ± 0,9</td>
<td>6,6 ± 1,4</td>
<td>6,8 ± 2,0</td>
<td>6,4 ± 1,5</td>
<td>5,3 ± 1,4</td>
<td>6,7 ± 1,6</td>
<td>0,000&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ø Fruit weight [% of control]</td>
<td>a</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>a</td>
<td>b</td>
<td></td>
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<tr>
<td><em>Monilinia laxa</em> [% infested flowers on 29th April]</td>
<td>16,9 ± 8,8</td>
<td>13,3 ± 8,2</td>
<td>9,8 ± 3,6</td>
<td>8,9 ± 3,7</td>
<td>3,0 ± 1,8</td>
<td>2,5 ± 1,0</td>
<td>0,000&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>b</td>
<td>ab</td>
<td>ab</td>
<td>a</td>
<td>a</td>
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</tbody>
</table>

*p-value from Anova*
Conclusions (cultivars)

- Organic production of cherries practicable with low input with suitable early mature cultivars; recommendable:
  - Bigarreau Burlat
  - Merchant
  - Bigarreau Moreau
Conclusions (thinning)

- Electroflor, manual thinning of young fruits, lime sulphur > thinning effect + fruit size
- Larger fruit size could only partly replace yield losses due to thinning
- No influence on fruit diseases and internal fruit quality
- Electroflor more suitable for farmers than manual thinning
- Sulphur and lime sulphur reduced flower infestations with *M. laxa*
Thank you for your attention!

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