Current Status and Future Outlook for Growing Tart Cherries

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### Production by the world’s top five sour cherry-producing countries, average 1997 to 2006

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Production (mt)</th>
<th>% World Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Russia</td>
<td>177,600</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>Poland</td>
<td>165,691</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Ukraine</td>
<td>139,860</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>Turkey</td>
<td>121,050</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>USA</td>
<td>114,599</td>
<td>10</td>
</tr>
</tbody>
</table>

**Source:** United Nations Food and Agriculture Organization, *FAOStat*, 2006.
Tart Cherry Acreage

- WA: 4,000 acres
- UT: 2,800 acres
- WI: 2,100 acres
- MI: 27,400 acres
- NY: 2,200 acres

1 USDA, 1999-2001
<table>
<thead>
<tr>
<th>State</th>
<th>Production (lbs)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>257.5 million</td>
<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>194.0</td>
<td>75.3 %</td>
</tr>
<tr>
<td>Utah</td>
<td>28.5</td>
<td>11.1 %</td>
</tr>
<tr>
<td>Washington</td>
<td>14.2</td>
<td>5.5 %</td>
</tr>
<tr>
<td>New York</td>
<td>8.8</td>
<td>3.4 %</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>6.5</td>
<td>2.5 %</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>3.3</td>
<td>1.3 %</td>
</tr>
<tr>
<td>Oregon</td>
<td>2.2</td>
<td>0.9 %</td>
</tr>
</tbody>
</table>
U.S., Polish and Turkish production of tart cherries, 2002-2011

Turkey's highest production
550 million lbs

Poland's highest production
443.8 million lbs

U.S. highest production
358 million lbs

Slide courtesy of Mollie Woods
Tart Cherries in Michigan
Grower Price vs. Total* Supply 1997 - 2011

*Total Supply = new crop + carryover + imports

Slide courtesy of Mollie Woods
### Tart Cherry Concentrate Sales 2002 to 2011

Water pack and pie filling uses have declined steadily for the past 15 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Concentrate (0)</th>
<th>Concentrate</th>
<th>Juice Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>7,372</td>
<td>239,523</td>
<td>246,895</td>
</tr>
<tr>
<td>2003</td>
<td>60,979</td>
<td>175,914</td>
<td>236,893</td>
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<tr>
<td>2004</td>
<td>67,420</td>
<td>148,150</td>
<td>215,570</td>
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<tr>
<td>2005</td>
<td>66,789</td>
<td>165,666</td>
<td>232,455</td>
</tr>
<tr>
<td>2006</td>
<td>41,034</td>
<td>162,999</td>
<td>204,033</td>
</tr>
<tr>
<td>2007</td>
<td>48,667</td>
<td>197,659</td>
<td>246,326</td>
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<tr>
<td>2008</td>
<td>63,198</td>
<td>229,178</td>
<td>292,376</td>
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<tr>
<td>2009</td>
<td>54,036</td>
<td>324,772</td>
<td>378,808</td>
</tr>
<tr>
<td>2010</td>
<td>33,663</td>
<td>367,343</td>
<td>401,006</td>
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<tr>
<td>2011</td>
<td>28,627</td>
<td>334,740</td>
<td>363,367</td>
</tr>
</tbody>
</table>

*Slide courtesy of Mollie Woods*
U.S. Imports of Tart Cherry Juice Concentrate, 2005-November 2012 (gallons)

Slide courtesy of Mollie Woods
In 2011, 18% of IQF and 48% of “5+1 Packed” cherries were used for drying.
Montmorency

A 400+ year old variety, the U.S. industry standard. A multi-purpose tart cherry for processing (canning, freezing, making pies).

The fruit is bright red, medium in size, with a clear, juicy, soft flesh. The trees are self-fruitful, winter hardy, precocious, very productive (fruit on 1-year-old shoots), somewhat resistant to European brown rot, but very susceptible to leaf spot.

Machine harvested into water-filled tanks.
Other Cultivars

English Morello / Schattenmorelle – hardy, productive (fruit on 1-year-old shoots), dark red-juiced, a week later than Montmorency, somewhat resistant to European brown rot

Surefire – from Cornell (1999), larger than Mont, not as productive but crops regularly (more spur habit), red flesh, late bloom, ripens 2 weeks after Mont, chemical-sensitive in early MI tests
Other Cultivars (very hardy)

Meteor – from Minnesota, Mont-type (red-yellow) fruit is larger and ripens 5 days later than Mont, compact tree, spur habit, leaf spot resistant, susceptible to brown rot, good for juice and wine, oblong pit

Northstar – from Minnesota, very hardy, very productive, red to dark red, similar in fruit size to Mont, ripens up to 2 weeks later, very compact tree, leaf spot resistant

Mesabi – from Minnesota, similar to Meteor (compact tree) but higher sugar
Rootstock Use in Michigan Tart Cherry Production (2003)

Vigorous rootstocks suitable for trunk-shaking
Cherry Leaf Spot
(*Blumeriella jaapi*)

Fungicides must be applied from budbreak through the end of summer. Premature defoliation can reduce cold hardiness.

**Key insects:** Plum curculio, cherry fruit fly, spotted wing drosophila
Continuous “Beside-the-Row” (BTR) Harvester Prototype

Don Peterson Harvester (USDA)

- Prototype harvester fingers 6” apart and ~20” long
- Harvester is 7’ high, with total finger-spindle length of 48”
- Spindles tilt and move side-to-side
MSU High Tunnel Project

- Plastic is 6-mil (3-4 year expected lifespan)
- Both plots are duplicated without tunnels
- Woven poly mulch (weed barrier) used
- Continuous Harvest at 1-2 mph, 6 hedgerow trees/minute
Fruit Quality Comparable to Trunk Shaker
Berry Harvesters best on non-spur willowy fruiting shoots
Grant’s BTR Prototype
BTR Continuous Harvest
Hedgerow Tree Prototype: requires high-yielding trees having reduced stature

Gisela 5, 6, and 12 were all similar to mahaleb in yield efficiency on trees half as large
Over-the-Row (OTR) Berry Harvesters (Oxbo, BEI)
OTR Harvesters In Poland
Continuous Hedgerow
OTR Harvester

Density: ~690 trees/acre
New System Template: Sweet Cherry Training

Testing dwarfing rootstocks, own-roots, system effects
Montmorency trained to a UFO canopy architecture for Over-the-Row harvester:

- How early to fill space?
- How early to harvest?
- Can vigor on mahaleb be controlled by training?

Adapting Fruiting Walls to Tart Cherry Production

2011 / Year 2

2012 / Year 3: Harvestable
Evaluating 3-Year-Old Canopy Architecture

Planting too horizontal created two strong upright leaders, others were weak
Even when planted at an angle, strong upright leaders can arise if not managed early.

Balanced fruiting zone from five balanced leaders developed in Year 2.
Late maturing, ripening 7-10 days after Montmorency. The fruit is dark red, large and very firm with a red juicy, sweet-tart flesh. Recommended for fresh markets and processing. Blooms later than Mont, seems to need cross-pollination (tart or sweet), as productivity can be a problem.
Danube
(Erdi Botermo)

Dark red, medium to large, sweeter than Montmorency (good fresh), can be picked with a dry stem scar. Ripens about a week before Montmorency. The trees are very productive, however, are more susceptible to winter injury than Montmorency. Planted widely in Europe.
An early maturing, dark red tart cherry variety for the fresh market.
Ripens five days before Danube and ten days before Montmorency.
Large fruit with good keeping qualities, hangs well on tree.

Jubileum
(Erdi Jubileum)
Carmine Jewel
(1999)

- Dark red,
- Good flavor,
- Very productive,
- Small fruit (3.5 g),
- Early ripening
Crimson Passion

- Dark red,
- High sugar and excellent flavor,
- Very firm,
- Low productivity,
- Low vigor,
- Fruit size (6.0 g)
**Romeo**

Dark red,
Similar to Carmine Jewel but much later,
Good sugar & juice,
Very productive,
Small fruit (4.0 g)

**Juliet**

Dark red,
High sugar and excellent flavor while still tart enough for pies,
Very productive,
Fruit size (5.0 g),
Earlier bloom
Valentine
Medium red (Mont type but light red flesh),
Fruit size (4.5 g),
Average bloom time

Cupid
Very dark purple red,
Good flavor,
Late bloom,
Good productivity,
Large fruit (6.5 g)
Questions?

For additional information, check out:

Greg Lang’s MSU Website: www.hrt.msu.edu/greg-lang

The MSU Cherry Website: www.cherries.msu.edu