Progress in Sweet Cherry Production in NY

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HVL and NYSAES

Highland and Geneva, NY
Sweet Cherry Bearing Acreage
United States, 2001-2010
Table 4. **SWEET CHERRIES**: Number of farms and acres, by size, 2001 and 2006

<table>
<thead>
<tr>
<th>Size Group (sweet cherry acres per farm)</th>
<th>2001 Farms</th>
<th></th>
<th>Acres</th>
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<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
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<td>Percent</td>
<td>Number</td>
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<tr>
<td>&lt;2</td>
<td>99</td>
<td>53</td>
<td>60</td>
<td>8</td>
<td>120</td>
<td>62</td>
<td>64</td>
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<tr>
<td>2-4.9</td>
<td>38</td>
<td>21</td>
<td>100</td>
<td>13</td>
<td>38</td>
<td>20</td>
<td>116</td>
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<tr>
<td>5-9.9</td>
<td>29</td>
<td>16</td>
<td>205</td>
<td>26</td>
<td>20</td>
<td>10</td>
<td>118</td>
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<tr>
<td>10-19.9</td>
<td>10</td>
<td>5</td>
<td>110</td>
<td>14</td>
<td>8</td>
<td>4</td>
<td>96</td>
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<tr>
<td>20+</td>
<td>9</td>
<td>5</td>
<td>309</td>
<td>39</td>
<td>8</td>
<td>4</td>
<td>296</td>
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<tr>
<td><strong>Total</strong> 1/</td>
<td>185</td>
<td>100</td>
<td>783</td>
<td>100</td>
<td>194</td>
<td>100</td>
<td>689</td>
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</table>

1/ Totals may not add due to rounding.
NY Statistics - 2010

Sweet Cherries:
750 acres
1000 tons
Avg Price $0.80
State Value of Utilized Production $1.6M
Reported Yields ~ 1.6 tons/acre
Growing Sweet Cherries

• Negatives
  – Climate
  – Birds
  – Perishability shelf life 7 days
  – Labor

• Positives
  – Market Demand – buy local
  – Research on Positive Benefits
    • Anti-inflammatory
    • Cancer
    • Alzheimer's
  – New Varieties
  – New Rootstocks
  – New Planting Systems
NY Sweet Cherries
Negatives

• Inconsistant yields – weather, secondary (or tertiary) crop.
• Very poor yields – 1.5 tons/acre
• Markets are all local - Farm Stand, Farmers markets, Upick, and local chains participating in buy local movement
• Very small industry – no synergism.
• There is very little experienced local help (consultants, extension specialists)
Bacterial Canker
Japanese Beetle
Protect against Deer Browsing and Buck Rubbing

All Sweet Cherry Blocks in New York MUST be Fenced
Growing Sweet Cherries

- **Negatives**
  - Climate
  - Birds
  - Perishability shelf life 7 days
  - Labor

- **Positives**
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  - Research on Positive Benefits
    - Anti-inflammatory
    - Cancer
    - Alzheimer's
  - New Varieties
  - New Rootstocks
  - New Planting Systems
NY Sweet Cherries
Positives

- The market seems unlimited! Growers never have enough cherries to sell – buy local
- Very, very profitable on good years particularly in Eastern NY
- There are new local varieties more suited to our humid climate.
- New integrated management methods which will successfully even out inconsistent production
So We Decided to work with Cherries!

- Increasing importance of alternate crops – Sweet Cherries a logical alternative!
- Interested Growers – New Royal, Bortchert, Red Jacket
- Dwarfing rootstocks now available
- Need to protect against birds
- Need to protect against cracking
- Leadership and Moral Support From MSU – Nugent, Lang, Flore
The Best Quality Cherries

- Giberellic Acid
- Harvest at optimum maturity
- Hydro cooling
- Refrigeration at < 39 degrees F
- MAP (Lifespan L-204 20# bags)
MAP Bags - LifeSpan

• 8% oxygen
• 8% CO2
• 95% humidity

• Published optimum storage conditions @32oF
  – 3-10% O2
  – 10-15% CO2
  – 90-95% humidity

Kalhke, Wargo, Zakour
Eating Quality

Quality Scale (6=Great, 1=Unedible)

- Fresh
- 30 days Cold Storage
- 30 days CS +MAP

Varieties

- Emporner Francis
- Sam
- Hartland
- Royalton
Stem Color Retention

<table>
<thead>
<tr>
<th>Variety</th>
<th>Fresh</th>
<th>30 days Cold Storage</th>
<th>30 days CS +MAP</th>
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</thead>
<tbody>
<tr>
<td>Emporer Francis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sam</td>
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<td></td>
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<tr>
<td>Hartland</td>
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<td></td>
</tr>
<tr>
<td>Royalton</td>
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</tbody>
</table>

Greenness Scale

Greenness Scale: 1=Brown, 5=Green
Fruit Size
Fruit Size

- LA/FS 200sq cm leaves for largest fruit
- Each leaf is approximately 33 sq cm
- 5-6 leaves per fruit
- Cluster with 5 fruit should have 30 leaves

Lang
Effects of Pruning
Fruit Size and Yield

- Minimal Pruning 8.6g
- Stub Pruning 9.3g
- Spur Thinning (extinction) 10.0g

Reginato
Variety Selection

Bob Andersen

- Large and Black
- Crack Resistance
- Productivity and Winter Hardiness

Suggestions
- Black Pearl – NY8139
- Radiance Pearl – NY7679
- Burgundy Pearl – NY 38L
- Ebony Pearl – NY32
- Regina
- Hedelfingen
- Hudson
- Sweetheart
Advantages and Disadvantages of High Density Systems

- Early bearing
- High yield
- Easy to pick
- Picking cost reduction
- Tree efficiency

- High establishment cost
- High level of management
- High level of knowledge
- Cover against hail and rain
- Short lifespan ?

- Improved Fruit Quality ?
- Early breakeven ?
How to choose the training system?

Environment
- Soil (Structure, texture, fertility, ecc.)
- Weather (temperature, Humidity, light, ecc.)

Technical subjects
- Soil management
- Pruning
- Irrigation and nutrition
- Level of knowledge of the grower

TREE
- vigour, Productivity, Efficiency, Fruit Quality,
- Cultivar
- Rootstock
- Interaction between cv / rootstock

Training system

Planting distance
Sweet Cherry Planting Systems Trial

- Established 3 acre Trial in May 1999 at the NYSAES
- Central Leader, Vogel Slender Spindle, Zahn Vertical Axis, Spanish Bush, Marchant Slant Trellis, V-Trellis
- Gisela 5, Gisela 6
- Hedelfingen, Sweetheart, Lapin
- Followed up in 2003 in Geneva
Methods

• We followed only the basic “recipes” we could find and modified each according to our experiences and perceived NY conditions. Mostly from Lynn Long – The Dalles Oregon.
• Rejected the “Steep Leader System” WA
• The result is a combination of SAH, TLR, and RLA’s thinking.
Sweet Cherry Planting Systems Trial

- Coordinated NC140 Trial – 2010 - Lang
  - Crist Farms
    - Super Spindle Axe – short pruned
    - Tall Spindle
    - Upright Fruiting Offshoots -
    - Kym Green Bush – Spanish Bush Modification
    - Gi 5, Gi 6, Gi 3
Rootstock Characteristics

- **Gisela® 5 and Gisela® 6:**
  - Complex hybrid (*Prunus cerasus* x *Prunus canescens*)
  - No suckers
  - Tolerant of *Monilia laxa* and *Pseudomonas syringae*
  - Gisela® 5 is 50% the size of mazzard
  - Gisela® 5 does best on very fertile soil
  - Very high yield efficiency
  - Very Early bearing
  - Induces wide crotch angle in the new shoots
Planting Sweet Cherries

• Gisela stocks (Gi. 5, 6, 12)
• Mazzard and Mahleb are too large a tree to cover! Needed precocity for size control and profitability.
• Rootstock shank 4-6 inches above ground
• Paint trunks white with cheap latex paint especially on the south side of the tree.
<table>
<thead>
<tr>
<th>Planting Systems</th>
<th>Trees/Acre</th>
<th>Tree Spacing</th>
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</thead>
<tbody>
<tr>
<td>Modified Central Leader</td>
<td>153</td>
<td>16 X 20</td>
</tr>
<tr>
<td>Spanish Bush</td>
<td>306</td>
<td>10 X 16</td>
</tr>
<tr>
<td>Slender Spindle</td>
<td>408</td>
<td>8 X 15</td>
</tr>
<tr>
<td>V-Slender Spindle</td>
<td>453</td>
<td>6 X 18</td>
</tr>
<tr>
<td>Vertical Axis</td>
<td>544</td>
<td>6 X 15</td>
</tr>
</tbody>
</table>
Robinson, Andersen, and Hoying, 2005

Cumulative Yield - Sweet Cherries

- V Slender Spindle
- V Axis
- S. Bush
- Central Leader

Planting Systems

Tons per Acre

Robinson et al. 2005
Mod. Central Leader
Tehranivee/Mahaleb
16’ x 20’
(136 Tr/Ac)
Systems

- CL
  - Headed annually
  - Branches spread when possible
  - Uprights removed

- Problems

- Branches too upright dominated tree, attempts at spreading resulted in canker formation, vigorous regrowth.
Vogel Slender Spindle
Lapins/Gisela 5
8' x 15'
(363 Tr/Ac)
System

- Vogel
  - Mini central leader with main scaffolds spread by hanging clothespins on branch ends and moving them out to the end weekly through growth
  - Bud removal in the second leaf
System

- Vee
  - Planted on an angle but strong upright growth forced us to trellis them.
  - Turned them into a Y shape with a single trunk
  - Canker has not been as big a problem as expected.
Zahn
6’X18’
403 Trees/Acre
Vertical Axis
Comparison of TCA's Rootstock and Variety

Trunk Cross-sectional Area (cm²)

<table>
<thead>
<tr>
<th>Rootstock</th>
<th>Regina</th>
<th>Lapins</th>
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<tbody>
<tr>
<td>Gi5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gi6</td>
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<tr>
<td>Gi12</td>
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<tr>
<td>Mazzard</td>
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</tbody>
</table>
Average Fruit Size Depends on Rootstock and Variety

Average Fruit Size (grams)

- Gi5: Lapins 8, Regina 11
- Gi6: Lapins 9, Regina 11
- Gi12: Lapins 9, Regina 11
- Mazzard: Lapins 9, Regina 11
Tree Spacing and Density/Acre

5yr Cumulative Yield/acre (tons)

- Gi5
- Gi6
- Gi12
- Mazzard

Tree Spacing and Density/Acre:
- 10'X18': 242
- 8'X18': 303
- 6'X18': 403
Bud Removal on 1 year old wood

- For early branch development
- At Bud Swell during dry period
- Do not head
- Preserve leader bud then remove all buds in top 8 inches of leader
- Then remove 2/3 buds on 1 year wood by removing 2 buds, leaving one bud, remove 2 buds, leave 1 bud, remove 2 etc.
Scaffolds

• Remove all buds on top of limb
• Remove all buds on bottom of limb

• Rub them off!
Stubbing Back
UFO – Upright Fruiting Offshoots

• 1\textsuperscript{st} tried with Jim Bittner in 1996
• Made sense but too afraid of Bac Canker so didn’t provide trellis and trees stood right back up again in 1\textsuperscript{st} season
• NC140 trial we are using nylon wire – jury is still out.
KGB – Kym Green Bush

- Pedestrian System
- Large Fruit Size
- Severe Pruning
Tall Spindle

- Wider spacings (6 ft)
- Permanent bottom tier
- Renewable top through stubbing and cutting back
- Similar to Zahn System
Super Spindle Axe

- Very High density – spacing 3 feet
- All branches cut back each year
- Fruiting at the base of 1 year wood, few spurs
- Large fruit
- Potential for partial mechanization (pruning)
- Fruiting wall?
These ‘fruiting feathers’ are cut back every year so as later to induce spring renewal via short winter pruning that leaves 2-3 vegetative buds, with length slightly decreasing from tree base to apex
Crop at base of 1 yr shoots
Covers against hail and rain
Haygrove to be installed this year!
That about Covers it!

Thanks

Questions?