Primocane Fruiting
Blackberry Trial Results

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Introduction

- *Rubus*
- The official State Fruit
- “U-pick”
- Small commercial production
- In 2006 there were 150 acres of blackberries in KY
- Mainly fresh market sales and jams and jellies
- Interest increasing
Blackberry Terminology

• Canes: Stems of bramble plants
• Canes last for two seasons, then die
• Primocane: A bramble cane going through its first year of growth
• Floricane: A bramble cane going through its second year of growth
• Most blackberries are floricane fruiting
• Some blackberries are primocane fruiting
Blackberry Types & Cultivars

• Erect Thorny
  – Cherokee
  – Shawnee
  – Chickasaw*
  – Kiowa

• Erect Thornless
  – Apache*
  – Ouachita*

• Semi-erect Thornless
  – Hull Thornless
  – Triple Crown*
  – Chester

• Trailing
  – Boysen (not hardy)
  – Marion (not hardy)

• Primocane Fruiting, Thorny
  – Prime-Jan*
  – Prime-Jim*

Data from Dr. John Strang
University of Kentucky
Prime-Jim & Prime-Jan

- Released by the University of Arkansas
- Recommended for home gardeners and for very limited commercial trial
- Fruit have poor shipping characteristics
- Fruit size and quality are affected by the hot temperatures
  - temperatures above 85°F can greatly reduce fruit set, size and quality on primocanes
Primocane Fruiting Blackberries

- Great for Farmers Markets in Kentucky (fruit from August until frost!)
- Floricane and Primocane fruiting
- Mowing instead of pruning
- Erect selections do not need a trellis
- Potential organic production
Objective

• To determine if advanced selections developed by the University of Arkansas Blackberry Breeding Program were superior to Prime-Jim® and Prime-Jan® in terms of yield and fruit quality under Kentucky growing conditions.
Blackberry Selections

• Established June 2006 at KSU

• Floricane fruiting selections:
  – Apache (thornless erect)
  – Chickasaw (thorny erect)
  – Triple Crown (thornless-trailing)

• Primocane fruiting selections:
  – Prime-Jim®
  – Prime-Jan®
  – APF-27, APF-40, APF-41, APF-42, APF-46, and APF-77
  – (all thorny erect, primocane-fruited)
Trial Design

• Randomized complete block design
  – 4 blocks
  – 20 plants of each cultivar or selection

• Spacing
  – 2 feet between each plant
  – Rows 70 feet long
  – Rows 14 feet apart

• Managed using National Organic Program standards

• Harvested on Monday and Thursday
Weed Control

• Manual
  – Hand
  – Hoe
  – Weed eater

• Mulching
  – Straw
Irrigation

• T-tape
• Lack of water seriously reduces yields
• Require 1” water/wk during growing season
• Best to irrigate throughout entire season
The April Freeze Event and High Summer Temperatures in 2007

• No fruit production data collected from floricanes
  – April freeze damaged floricanes

• Summer temperatures
  – Warm temps thought to reduce fruit set on primocanes
  – 44 days over 85°F in August and September, 2007
Prime Jim

- Yield: very low
- Berry size: 1.9 g
- Brix: 13.1
- Harvest:
  - start 8/2, half 8/27, end 10/26 (frost)
- Comments: Poor fruit set and size due to high temperatures?
Prime-Jan

- Yield: good
- Berry size: 3.2 g
- Brix: 10.3
- Harvest: start 8/2, half 8/30, end 10/26

- Comments: Better yields than expected; not influenced by the summer heat as much as Prime Jim?
APF-27

- Yield: low
- Berry size: 3.0 g
- Brix: 12.5
- Harvest:
  - Start 8/2, half 9/4, end 10/26
- Comments: Nice flavor.
APF-40

• Yield: very good
• Berry size: 3.9 g
• Brix: 12.5
• Harvest:
  – start 8/6, half 8/27, end 10/26

• Comments: best producer; largest fruit; best choice so far.
APF-41

- Yield: low
- Berry size: 3.7 g
- Brix: 14
- Harvest:
  - start 8/20, half 9/11, end 10/26
- Comments: Late harvest; nice fruit form and size.
APF-42

- Yield: low
- Berry size: 2.2 g
- Brix: 12.7
- Harvest:
  - start 8/6, half 9/6, end 10/26
- Comments: Double fruits a big problem for harvest; already dropped from the trial.
APF-46

- Yield: low
- Berry size: 2.6 g
- Brix: 13.7
- Harvest:
  - start 8/2, half 9/11, end 10/26

- Comments: Small plants, may benefit from pinching at 0.5 meter.
APF-77

- Yield: low
- Berry size: 3.1 g
- Brix: 11.2
- Harvest:
  - start 8/2, half 9/24, end 10/26
- Comments: Late harvest period; interesting flavor.
# 2007 Yield and Berry Weight Data

<table>
<thead>
<tr>
<th>Selection</th>
<th>Yield (lb/acre)</th>
<th>Berry weight (g)</th>
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</thead>
<tbody>
<tr>
<td>APF-27</td>
<td>1931 b</td>
<td>2.8 bc</td>
</tr>
<tr>
<td>APF-40</td>
<td><strong>3180 a</strong></td>
<td><strong>3.9 a</strong></td>
</tr>
<tr>
<td>APF-41</td>
<td>1738 b</td>
<td><strong>3.7 a</strong></td>
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<tr>
<td>APF-42</td>
<td>1974 b</td>
<td>2.2 de</td>
</tr>
<tr>
<td>APF-46</td>
<td>1677 b</td>
<td>2.6 cd</td>
</tr>
<tr>
<td>APF-77</td>
<td>2136 b</td>
<td>3.1 b</td>
</tr>
<tr>
<td>Prime-Jan®</td>
<td><strong>2235 ab</strong></td>
<td>3.2 b</td>
</tr>
<tr>
<td>Prime-Jim®</td>
<td>367 c</td>
<td>1.9 e</td>
</tr>
</tbody>
</table>

P-value 0.001 0.001  
Significance *** ***
## Harvest 2007

<table>
<thead>
<tr>
<th>Selection</th>
<th>First harvest</th>
<th>Mid point (half berry wt)</th>
<th>Last harvest</th>
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<tbody>
<tr>
<td>APF-27</td>
<td>8/02</td>
<td>9/04</td>
<td>10/26</td>
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<tr>
<td>APF-40</td>
<td>8/06</td>
<td>8/27</td>
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<td>APF-41</td>
<td>8/20</td>
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</tr>
<tr>
<td>APF-42</td>
<td>8/06</td>
<td>9/06</td>
<td>10/26</td>
</tr>
<tr>
<td>APF-46</td>
<td>8/02</td>
<td>9/11</td>
<td>10/26</td>
</tr>
<tr>
<td>APF-77</td>
<td>8/02</td>
<td>9/24</td>
<td>10/26</td>
</tr>
<tr>
<td>Prime-Jan®</td>
<td>8/02</td>
<td>8/30</td>
<td>10/26</td>
</tr>
<tr>
<td>Prime-Jim®</td>
<td>8/02</td>
<td>8/27</td>
<td>10/26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Frost)</td>
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Early Tasting Data From UK and KSU Events

N = 21

<table>
<thead>
<tr>
<th>Selection</th>
<th>flavor</th>
<th>sweetness</th>
<th>bitterness</th>
<th>tartness</th>
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</thead>
<tbody>
<tr>
<td>Prime Jan</td>
<td>3.0 ab</td>
<td>2.6 cd</td>
<td>3.2 ab</td>
<td>3.4</td>
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<tr>
<td>Prime Jim</td>
<td>2.7 b</td>
<td>2.4 d</td>
<td>3.4 a</td>
<td>3.3</td>
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<tr>
<td>APF-27</td>
<td>3.3 ab</td>
<td>3.0 abcd</td>
<td>2.6 abc</td>
<td>2.6</td>
</tr>
<tr>
<td>APF-40</td>
<td>3.6 a</td>
<td>3.2 ab</td>
<td>2.2 c</td>
<td>2.6</td>
</tr>
<tr>
<td>APF-41</td>
<td>2.9 b</td>
<td>2.6 cd</td>
<td>2.7 abc</td>
<td>3.1</td>
</tr>
<tr>
<td>APF-42</td>
<td>3.7 a</td>
<td>3.5 a</td>
<td>2.4 bc</td>
<td>2.7</td>
</tr>
<tr>
<td>APF-46</td>
<td>3.2 ab</td>
<td>2.8 bcd</td>
<td>3.1 ab</td>
<td>2.6</td>
</tr>
<tr>
<td>APF-77</td>
<td>3.6 a</td>
<td>3.1 abc</td>
<td>2.5 bc</td>
<td>3.0</td>
</tr>
</tbody>
</table>

sig * ** * NS

5=intense 5=intense 5=intense 5=intense
1=mild 1=mild 1=mild 1=mild
Conclusions

• Primocane fruiting blackberries could be a niche-market crop for Kentucky growers (farmers markets) from Mid-summer until until frost.

• Mowing instead of pruning, no trellis, and potential organic production are also attractive to growers.

• APF advanced selections have improved characteristics over Prime Jim and Prime Jan.

• APF-45 will also be established at KSU in 2008 and be evaluated.

• APF selections are not currently available to growers and patent decisions have yet to be made.
Questions?