New Arkansas Blackberry Production Characteristics

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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
Floricane Fruiting Blackberries
Arkansas Blackberry Breeding Program

- The University of Arkansas Blackberry Breeding Program has developed many excellent floricane blackberry cultivars including:
  - Apache, Arapaho, Cherokee, Comanche, Cheyenne, Chickasaw, Choctaw, Kiowa, Navaho, Ouachita, and Shawnee
Objective

• To compare production characteristics from a number of advanced floricane fruiting selections, developed by the University of Arkansas Blackberry Breeding Program under Kentucky growing conditions.
Materials and Methods

• In June 2006, a blackberry variety trial was established at Kentucky State University.

• Trial includes:
  – Standards:
    • Chickasaw (thorny erect)
    • Triple Crown (semi-erect, thornless)
  – University of Arkansas (Thornless, erect):
    • A-1937T
    • A-2215T
    • A-2241T
    • A-2315T
    • A-2241T (Natchez)
Materials and Methods

• Completely randomized design (2 replicate plots containing 5 plants of each selection in a 10 foot plot).

• Rows were spaced 14 feet apart.

• his trial was managed with organic practices following the National Organic Program Standards.
  – Weed control: 6-8 inch layer of straw and hand weeding.
  – Irrigated weekly with t-tape laid in the rows.
  – Plastic wire t-post trellis
Wire and post trellis
Flowering

• Flower buds of the floricanes of all blackberry selections were destroyed by the Easter freeze event of 2007.
• In 2008 and 2009, selections flowered in June and ripe fruit were harvested from plants each Monday and Thursday until August.
Chickasaw
## Yield in 2008 and 2009

<table>
<thead>
<tr>
<th>Selection</th>
<th>2008 Yield (lb/acre) $^1$</th>
<th>2009 Yield (lb/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1937T</td>
<td>10430</td>
<td>1220</td>
</tr>
<tr>
<td>A-2215T</td>
<td>8359</td>
<td>1515</td>
</tr>
<tr>
<td>A-2315T</td>
<td>6526</td>
<td>1343</td>
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<tr>
<td>‘Natchez’</td>
<td>8924</td>
<td>3158</td>
</tr>
<tr>
<td>‘Chickasaw’</td>
<td>8259</td>
<td>3750</td>
</tr>
<tr>
<td>‘Triple Crown’</td>
<td>6782</td>
<td>5541</td>
</tr>
</tbody>
</table>

Significance: ns ns
## Berry Weight in 2008 and 2009

<table>
<thead>
<tr>
<th>Selection</th>
<th>2008 Berry weight (g)</th>
<th>2009 Berry weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1937T</td>
<td>4.3 cd</td>
<td>3.1 bc</td>
</tr>
<tr>
<td>A-2215T</td>
<td>3.8 d</td>
<td>2.9 c</td>
</tr>
<tr>
<td>A-2315T</td>
<td>5.5 b</td>
<td>4.5 abc</td>
</tr>
<tr>
<td>‘Natchez’</td>
<td>6.8 a</td>
<td>5.4 ab</td>
</tr>
<tr>
<td>‘Chickasaw’</td>
<td>5.4 bc</td>
<td>4.9 abc</td>
</tr>
<tr>
<td>‘Triple Crown’</td>
<td>4.6 bcd</td>
<td>5.9 a</td>
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<tr>
<td>Significance</td>
<td>0.007</td>
<td>0.05</td>
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## Harvest Dates in 2008 and 2009

<table>
<thead>
<tr>
<th>Selection</th>
<th>2008 Harvest dates</th>
<th>2009 Harvest dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1937T</td>
<td>6/30 – 8/3</td>
<td>7/2 – 7/30</td>
</tr>
<tr>
<td>A-2315T</td>
<td>7/3 – 8/3</td>
<td>7/2 – 8/3</td>
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<tr>
<td>‘Natchez’</td>
<td>6/26 – 8/3</td>
<td>6/25 – 8/3</td>
</tr>
<tr>
<td>‘Chickasaw’</td>
<td>6/30 – 8/3</td>
<td>6/25 – 8/6</td>
</tr>
<tr>
<td>‘Triple Crown’</td>
<td>7/17 – 8/14</td>
<td>7/2 – 8/13</td>
</tr>
</tbody>
</table>

**Significance**

-
Summary

• Drought in 2008 reduced the number of floricanes and yields in all selections in 2009.

• Anthracnose damaged some canes and reduced yields.

• Natchez has been released for commercial production and could potentially be a popular new addition for blackberry production in Kentucky.
Primocane Fruiting Blackberries
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 primocanies
Primocane Fruiting Blackberries

• Great for Farmers Markets in Kentucky (fruit from August until frost!)
• Florigane 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-fruiting)
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
Blackberry Pests
Blackberry Pests
Blackberry Diseases
Flowering and Fruiting

• 2007
  – No fruit production data collected from floricanes due to spring frost.
  – Fruit harvested from primocanes.
• 2008 and 2009
  – Floricane and primocane crops harvested.
### 2007-2009 Yield Data

<table>
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<tr>
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<tbody>
<tr>
<td>APF-27</td>
<td>1494 bc</td>
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<td>3005 a</td>
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<td>3682 ab</td>
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<td>APF-40</td>
<td>2598 a</td>
<td>1999 b</td>
<td>1947 bc</td>
<td>-</td>
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<td>3669 ab</td>
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<tr>
<td>APF-41</td>
<td>1415 bc</td>
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<td>873 d</td>
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<td>APF-46</td>
<td>1021 c</td>
<td>672 d</td>
<td>1179 cd</td>
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<td>-</td>
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<td>APF-77</td>
<td>1104 c</td>
<td>3717 a</td>
<td>2229 ab</td>
<td>-</td>
<td>-</td>
<td>4189 a</td>
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<td>Prime Jan</td>
<td>1718 b</td>
<td>856 cd</td>
<td>2003 abc</td>
<td>31 b</td>
<td>5 b</td>
<td>2517 bc</td>
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<td>Prime Jim</td>
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<td>1856 bc</td>
<td>691 d</td>
<td>5 b</td>
<td>1390 c</td>
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## 2007-2009 Fruit Weights

<table>
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<td>APF-27</td>
<td>3.0 b</td>
<td>3.6 c</td>
<td>3.5 bc</td>
<td>-</td>
<td>5.3 abc</td>
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<tr>
<td>APF-40</td>
<td>4.0 a</td>
<td>5.0 b</td>
<td>3.9 ab</td>
<td>-</td>
<td>5.9 ab</td>
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<td>APF-41</td>
<td>3.9 a</td>
<td>6.2 a</td>
<td>4.4 a</td>
<td>5.1 a</td>
<td>6.3 a</td>
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<tr>
<td>APF-46</td>
<td>2.5 c</td>
<td>3.0 d</td>
<td>3.0 cd</td>
<td>-</td>
<td>-</td>
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<td>APF-77</td>
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<td>3.8 c</td>
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<td>4.0 c</td>
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</table>

Notes: Primocane A. Prim., Floricane F. Flor., APF Average Prince Flavor, Prime Jan = January Release Date, Prime Jim = Jim Release Date.
<table>
<thead>
<tr>
<th></th>
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<td>-</td>
<td>8/2 - 10/26</td>
<td>6/18 - 7/21</td>
<td>8/3 - 10/20</td>
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<td>APF-40</td>
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<td>8/6 - 10/26</td>
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<td>8/14 - 10/20</td>
<td>7/2 - 8/3</td>
<td>8/6 - 10/13</td>
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</tbody>
</table>
Conclusions

• Small 2009 floricane crop due to:
  – 1) 2008 drought reduced the number of canes for floricane production in 2009
  – 2) winter injury to canes (-2.7°F on 1/26/09)
  – 3) anthracnose canker damaged some canes

• 2009 Primocane crops were high for all selections
Conclusions (continued)

• Primocane fruiting blackberries could be a niche-market crop for Kentucky growers (farmers markets) from Mid-summer until frost.
• Mowing instead of pruning, no trellis, and potential organic production are also attractive to growers.
• APF-45 has been released.
• APF-40, 41, and 77 are under consideration for release by the University of Arkansas.
2009 Thornless Primocane Blackberry Trial at KSU
Questions?