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.
• This 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, selections flowered in June and ripe fruit were harvested from plants each Monday and Thursday until August.
Chickasaw
Chickasaw

A-2241T

Natchez
# Yield and Berry Weight in 2008

<table>
<thead>
<tr>
<th>Selection</th>
<th>Yield (lb/acre)</th>
<th>Berry weight (g)</th>
<th>Brix</th>
<th>2008 Harvest Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1937T</td>
<td>10,430</td>
<td>4.3</td>
<td>8.0</td>
<td>6/30 – 8/3</td>
</tr>
<tr>
<td>A-2215T</td>
<td>8,359</td>
<td>3.8</td>
<td>9.2</td>
<td>7/3 – 8/11</td>
</tr>
<tr>
<td>A-2315T</td>
<td>6,526</td>
<td>5.5</td>
<td>7.8</td>
<td>7/3 – 8/3</td>
</tr>
<tr>
<td>Natchez</td>
<td>8,924</td>
<td>6.8</td>
<td>8.7</td>
<td>6/26 – 8/3</td>
</tr>
<tr>
<td>Chickasaw</td>
<td>8,259</td>
<td>5.4</td>
<td>9.2</td>
<td>6/30 – 8/3</td>
</tr>
<tr>
<td>Triple Crown</td>
<td>6,782</td>
<td>4.6</td>
<td>11.3</td>
<td>7/17 – 8/14</td>
</tr>
</tbody>
</table>

Significance: ns ** ***

LSD (5%): - 1.2 0.7 -
## Arkansas Trials Established in 2004

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>2005</th>
<th>2006</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yield (lbs/Acre)</td>
<td>Wt/berry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarksville</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natchez</td>
<td>11,400</td>
<td>7,763</td>
<td>8.7</td>
<td>8.0</td>
</tr>
<tr>
<td>Apache</td>
<td>11,655</td>
<td>9,549</td>
<td>8.6</td>
<td>8.2</td>
</tr>
<tr>
<td>Quachita</td>
<td>7,955</td>
<td>7,137</td>
<td>6.3</td>
<td>6.2</td>
</tr>
<tr>
<td>Hope</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Natchez</td>
<td>6,398</td>
<td>7,513</td>
<td>6.7</td>
<td>4.4</td>
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<tr>
<td>Apache</td>
<td>3,818</td>
<td>8,887</td>
<td>7.9</td>
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</tr>
<tr>
<td>Quachita</td>
<td>2,820</td>
<td>19,347</td>
<td>5.8</td>
<td>4.7</td>
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</table>

(Clark and Moore, 2008)
Fig. 1. Pedigree of ‘Natchez’ blackberry.
Summary

• 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 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-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
Flowering and Fruiting

• 2007
  – No fruit production data collected from floricanes due to spring frost.
  – Fruit harvested from primocanes.
• 2008
  – Floricane and primocane crops harvested.
  – Drought conditions negatively impacted primocane crop.
Selected Floricane Fruit
Chickasaw

APF-77

APF-41
Primocane Fruit
## 2007 and 2008 Yield Data

<table>
<thead>
<tr>
<th>Selection</th>
<th>Primocane 2007</th>
<th>Floricane 2008</th>
<th>Primocane 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>APF-27</td>
<td>1494</td>
<td>1097</td>
<td>3005</td>
</tr>
<tr>
<td>APF-40</td>
<td>2598</td>
<td>1999</td>
<td>1947</td>
</tr>
<tr>
<td>APF-41</td>
<td>1415</td>
<td>4415</td>
<td>873</td>
</tr>
<tr>
<td>APF-46</td>
<td>1021</td>
<td>672</td>
<td>1179</td>
</tr>
<tr>
<td>APF-77</td>
<td>1104</td>
<td>3717</td>
<td>2229</td>
</tr>
<tr>
<td>Prime Jan</td>
<td>1718</td>
<td>856</td>
<td>2003</td>
</tr>
<tr>
<td>Prime Jim</td>
<td>295</td>
<td>1856</td>
<td>691</td>
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</table>

**Significance**

** ** **

LSD 604 1007 1048
## 2007 and 2008 Fruit Weights

<table>
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<tr>
<th>Selection</th>
<th>Primocane</th>
<th>Floricane</th>
<th>Primocane</th>
</tr>
</thead>
<tbody>
<tr>
<td>APF-27</td>
<td>3.0</td>
<td>3.6</td>
<td>3.5</td>
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<tr>
<td>APF-40</td>
<td>4.0</td>
<td>5.0</td>
<td>3.9</td>
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<tr>
<td><strong>APF-41</strong></td>
<td><strong>3.9</strong></td>
<td><strong>6.2</strong></td>
<td><strong>4.4</strong></td>
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<tr>
<td>APF-46</td>
<td>2.5</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>APF-77</td>
<td>3.3</td>
<td>3.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Prime Jan</td>
<td>3.3</td>
<td>4.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Prime Jim</td>
<td>2.0</td>
<td>3.6</td>
<td>2.7</td>
</tr>
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</table>

**Significance**

- **2007 and 2008 Fruit Weights**

**LSD**

- 0.4
- 0.5
- 0.7
## Harvest Dates 2007 and 2008

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>APF-27</td>
<td>-</td>
<td>8/2 - 10/26</td>
<td>6/18 - 7/21</td>
<td>8/3 - 10/20</td>
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<tr>
<td>APF-40</td>
<td>-</td>
<td>8/6 - 10/26</td>
<td>6/18 - 8/1</td>
<td>8/3 - 10/20</td>
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<td>APF-41</td>
<td>-</td>
<td>8/20 - 10/26</td>
<td>6/18 - 8/11</td>
<td>8/25 - 10/20</td>
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<tr>
<td>APF-46</td>
<td>-</td>
<td>8/2 - 10/26</td>
<td>6/18 - 7/24</td>
<td>8/11 - 10/20</td>
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<tr>
<td>APF-77</td>
<td>-</td>
<td>8/2 - 10/26</td>
<td>6/18 - 7/28</td>
<td>8/3 - 10/20</td>
</tr>
<tr>
<td>Prime Jan</td>
<td>-</td>
<td>8/2 - 10/26</td>
<td>6/18 - 7/24</td>
<td>8/11 - 10/20</td>
</tr>
<tr>
<td>Prime Jim</td>
<td>-</td>
<td>8/2 - 10/26</td>
<td>6/18 - 7/21</td>
<td>8/14 - 10/20</td>
</tr>
</tbody>
</table>
Conclusions

• 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-41 is in the final stages of release and should be available to the public soon.
• APF-45 was established at KSU in 2008 and will be evaluated.
Questions?