Introduction

• *Rubus*
• Native to Kentucky
• Historically wild harvested
• The official State Fruit
• “U-pick”
• Small commercial production
• 110 acres in Kentucky in 2002
• 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
Apache

- Erect thornless
- Ripens after Ouachita
- Very attractive, largest thornless erect berry, 8-10 g, size remains large all season
- No sterile drupelets
- Very good flavor and sweetness, 9.8% SS, stores well
- Highest yielding of erect thornless varieties
- Vigorous plant
- Problem with white drupelets
- Tolerant to rosette, no orange rust observed

Data and photos from Dr. John Strang
University of Kentucky
Ouachita

- Erect thornless
- Earlier than Apache with similar hardiness
- Attractive 6-7g berry
- Excellent flavor, 10+% soluble solids
- Excellent yields
- Good post harvest handling
- Vigorous plant
- Resistant to rosette, no orange rust reported

Data and photos from Dr. John Strang
University of Kentucky
Chickasaw

- Erect thorny
- Season – mid
- Yield – high
- Fruit size – large 11 g
- Flavor – excellent 9.6%
- Moderately hardy
- Excellent flower and fruit fertility, very attractive berry
- Moderately resistant to anthracnose, no orange rust observed, unknown rosette

Photo from University of Arkansas  
Data from Dr. John Strang  
University of Kentucky
Triple Crown

- Ripens with or slightly after Hull Thornless
- Attractive, largest thornless semi-erect berry, 7.6 g
- Very good sweet aromatic flavor with pleasant aftertaste, 11.1% SS
- Lower yields than Chester and Hull
- Berries firm, but do not hold up as well as Chester and Hull
- Resistant to rosette, orange rust, and phytophthora

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

• Performance very variable due to location
  – In Aug. and early Sept., 5 days of 85°F or more reduces yield, fruit size and quality.
  – No understanding of hardiness, survived 10°F

• Fruit are 2-10 g

• Plants produced fruit up into November in Kentucky with the 2004 mild fall

• Fruit set problems with hot temperatures

Data from Dr. John Clark
University of Arkansas
and Dr. John Strang
University of Kentucky
Prime Jim & Jan

• Recommended for home gardeners now and for very limited commercial trial
• Fruit do not have the shipping characteristics of the thornless erect blackberries.
• Considerably improved thorny and thornless varieties will be available in the next 4-6 years.

Data from Dr. John Clark University of Arkansas and Dr. John Strang University of Kentucky
Growing Blackberries
Weed Control

- Manual
  - Hand
  - Hoe
  - Weedeater

- Mulching
  - Straw
  - Hay
  - Wood chips
Irrigation

- Lack of water seriously reduces yields
- Require 1” water/wk during growing season
- Best to irrigate throughout entire season
- Irrigation very important after harvest
- Without irrigation, more severe pruning improves berry size

Data from Dr. John Strang
University of Kentucky
Tipping

- Increases lateral growth
- Increases flowering and fruit set
- Makes plants more manageable
- Tipping of Prime-Jim and Prime-Jan is very important (canes will grow tall)
  - Tipped by hand at a height of 1 meter
White Tail Deer

- Browse damage
- Electric fencing
Red-Necked Cane Borer

- Adults lay covered eggs
- Larvae exit egg directly into plant
  - Not exposed to pesticides
- Larvae move into pith and downward
- Larvae over winter in cane
- Pupate in April
- Adult emerges in 20-40 days

Data from Dr. John Strang
University of Kentucky
Japanese Beetle

- Damages both foliage and fruit
- Appearing in orchards now
Tarnished Plant Bug
White Drupelets

Sunburn—often a problem on Apache

Photo from Dr. John Strang
University of Kentucky
Aphids
Ladybeetle
Virus
Orange Rust

• Remove and destroy infected plants

Photo from Dr. John Strang
University of Kentucky
Crown Gall

• Dig out and remove infected plants

Photo from Dr. John Strang
University of Kentucky
Blackberry Harvest

- Thorny
  - June 15-July 15
- Thornless erect
  - June 16-Aug. 5
- Thornless semi erect
  - July 1- Sept. 1
- Primocane fruiting
  - Late August-frost
- Avoid harvesting wet berries
- Pick gently lifting berries with thumb and fingers
- When harvesting for sale, don’t pick fruit when dead ripe

Data from Dr. John Strang
University of Kentucky
Blackberry Harvest

• Harvest interval
  – 3-5 day interval at first
  – 1-2 day interval at peak harvest

• Harvest quantity
  – 10 lb/hr experienced picker
  – 14 lb/hr excellent
  – 6-7 lb/hr less effective harvesters

• 8-10 pickers/A at maximum production

Data from Dr. John Strang
University of Kentucky
Blackberry Quality Maintenance

- Place berries in shade immediately after harvest
- Refrigerate 40 to 60 minutes after harvest
- Cool to 32 to 40 F at a high relative humidity
- Each hour delay in getting berries refrigerated reduces storage life by one day.

Data from Dr. John Strang
University of Kentucky
KSU Blackberry Variety Trial

- Advanced selections from the University of Arkansas
- Primocane fruiting
- Floricane fruiting
- Commercially available primocane and floricane fruiting varieties.
<table>
<thead>
<tr>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
<th>2 rows comprise 1 block</th>
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<td>Row 4</td>
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<td>Apache</td>
<td>Triple Crown</td>
<td>Prime Jan</td>
<td>Heritage</td>
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<td>APF-77</td>
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<td>APF-27</td>
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<td>TC (KSU)</td>
<td>A-2315T</td>
<td>APF-77</td>
<td>Prime Jan</td>
<td>APF-27</td>
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</table>

**Blackberry Trial Map**
First Year Survival & Vigor

- Taken in October 2006
- Survival
- Number of canes
- Number of flowering/fruiting canes
- Vigor
## First Year Survival & Vigor

<table>
<thead>
<tr>
<th>Selection</th>
<th>Survival</th>
<th># of canes</th>
<th># of flowering or fruiting canes</th>
<th>Vigor</th>
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<tbody>
<tr>
<td>APF-27</td>
<td>100 a</td>
<td>39</td>
<td>4 d</td>
<td>6.6</td>
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<tr>
<td>APF-40</td>
<td>100 a</td>
<td>32</td>
<td>6 cd</td>
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<tr>
<td>APF-41</td>
<td>100 a</td>
<td>34</td>
<td>5 cd</td>
<td>6.8</td>
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<tr>
<td>APF-42</td>
<td>100 a</td>
<td>32</td>
<td>6 cd</td>
<td>6.0</td>
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<tr>
<td>APF-46</td>
<td>100 a</td>
<td>39</td>
<td>15 a</td>
<td>7.0</td>
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<tr>
<td>APF-77</td>
<td>100 a</td>
<td>29</td>
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<tr>
<td>PrimeJan</td>
<td>85 a</td>
<td>31</td>
<td>12 bc</td>
<td>4.1</td>
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<tr>
<td>PrimeJim</td>
<td>55 b</td>
<td>22</td>
<td>9 bc</td>
<td>5.0</td>
</tr>
</tbody>
</table>

P-value: 0.001 0.020 0.001 0.052
Significance: *** N.S. *** N.S.
Results

• APF selections had good survival
• Prime Jim had poor survival
• Total cane number was similar for all genotypes
• APF-46 produced the most flowering/fruited canes
• APF-27 and APF-77 produced the fewest
• Vigor was similar for all genotypes; however, there was a trend for Prime-Jim® and Prime-Jan® plants to be less vigorous than the APF selections
Discussion

• APF-46 produced more flowering/fruiting canes than other genotypes
• Although first year survival and vigor were acceptable for APF selections, fruit weight, flavor, total yield, flowering and harvest dates, disease/insect resistance, and overall plant vigor characteristics will need to be evaluated over the next 5 years to determine suitability for Kentucky growers.
2007 Freeze Event

• Long lasting freeze event
• 15 F recorded at the KSU research farm
• All actively growing blackberry shoots killed
## Winter Cane Dieback

<table>
<thead>
<tr>
<th>Selection</th>
<th>Percent Cane Dieback</th>
<th>Significance</th>
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<tr>
<td>A-1937T</td>
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<td>A-2215T</td>
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<td>A-2241T</td>
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<td>A-2315T</td>
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<tr>
<td>Apache</td>
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</tr>
<tr>
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<td>a</td>
</tr>
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<td>15.0</td>
<td>ef</td>
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<tr>
<td>Chickasaw</td>
<td>4.3</td>
<td>ef</td>
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<tr>
<td>Prime Jan</td>
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<td>b</td>
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<tr>
<td>Prime Jim</td>
<td>45.6</td>
<td>bc</td>
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<tr>
<td>Triple Crown</td>
<td>5.6</td>
<td>ef</td>
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</tbody>
</table>
Discussion

• APF-46 had the highest cane dieback
• Prime Jim & Jan also suffered from high dieback
• Primocane fruiting genotypes tended to have more dieback than floricane dieback
• May not be an issue if plants are mowed down every season
Conclusions

• Primocane fruiting blackberries have the potential to produce a niche-market crop for Kentucky growers from late summer until frost; However, the currently available primocane blackberry selections Prime-Jim® and Prime-Jan® are not suitable for commercial production.

• APF selections may have improved characteristics over currently available primocane fruiting selections

• Mowing plants down in spring may delay blooming until the hottest weather has past
Acknowledgements

• Dr. John Strang, University of Kentucky
• Dr. John Clark, University of Arkansas
• KSU Land Grant Program
Questions?