Blackberry Variety Selection

Amanda McWhirt
Horticulture Extension Specialist, University of Arkansas
Blackberry Biology and Lifecycle
Blackberry Plant Structures

Biennial Crop Production

Lateral

Floricane

Primocanes

first year canes

daughter plant

crown

sucker

flowering cane

second year cane

Source: NSW WeedWise.
Growth Type

- Erect, Semi-Erect and Trailing

- Thorny & Thornless

Prime-Ark® 45.
Photo Gina Fernandez

Navaho
Photo Gina Fernandez
Fruiting Habit

- **Floricane**
  - Fruit on Laterals produced on 2 year old canes in *early Summer*

- **Primocane**
  - Fruit on the ends of new canes in *late summer/Fall*
Lifecycle

• Chilling Hours Accumulation
  – *Temperatures below 45 °F*

Estimates of Chilling Hours in AR

- 1,200-1,400
- 1,000-1,200
- 800-1,000
- 600-800

- Navajo, Apache: 800-900 hours
- Ouachita: 400-500 hours
- Osage: 350-450 hours
- Prime-Ark® 45: 300 hours
- Natchez: 300 hours

– Winter injury at 0 °F
  • *Winter temp fluctuations can result in damage at higher temps*
Lifecycle

Jan  Feb  Mar  April  May  June  July  Aug  Sept  Oct  Nov  Dec

“Blackberry Winter”

- Cold spell that occurs while blackberries are in bloom

Minimum temperature: 27°F
Lifecycle

- 35-45 days from flower to ripe fruit
- Harvest period 4-7 weeks
- Heat issues over 85-90°F

extreme heat = double berry
Lifecycle

- Fruiting cane death
  - Remove dead canes and weak primocanes
- Plants enter dormancy

Upcoming Season’s Floricanes → Cane death
Blackberry Varieties Developed in Arkansas
Breeding Blackberries in Arkansas: January 1964 – Present. (In Its 53rd Year!)

Dr. James N. Moore, 1967

Thanks to Dr. John Clark for many of the following slides.

Dr. John Clark, Current Breeder
Arkansas Blackberries Globally

- Native crop to USA, more adapted than many other fruit crops
- Varieties developed in Arkansas are grown worldwide
  - Thorn-less, Primocane fruiting, Flavor, and Size
-45” of rain, all months
-0 to 100° F extremes; high chilling
-Most organisms (pathogens and insects) known to man....
Blackberry Varieties Developed in Arkansas

Comanche
Cherokee
Cheyenne

Shawnee
Choctaw
Kiowa
Chickasaw

Navaho
Arapaho
Apache
Ouachita
Nathecze
Osage

‘Prime-Ark® 45’ (2009)
‘Prime-Ark® Freedom’ (2013)
‘Prime-Ark® Traveler’ (2014)

1970s 1989 2000

Thornless Primocane Fruiting

No resistance to double blossom/ rosette
Cercosporella rubi [Wint.]
Plakidas

Resistant to double blossom/ rosette

Proc. XI Int. Rubus and Ribes Symp.
Eds.: G.E. Fernandez and K.E. Hummer
Fruiting Type

Floricane

- Produce Fruit on 2nd year growth
  - Early summer
- These are the primary varieties grown where hot summer heat is an issue
- Regular pruning required in fall and winter along with “tipping”

Primocane

- Produce Fruit on 1st year growth
  - Early Fall
- Can be managed with minimal fall pruning
  - Can also be managed with selective pruning to fruit both in the fall and spring.
- Must “Tip” in late spring
- Heat issues over 85-90°F
  - May limit ability to grow primocane fruiting varieties
  - Extreme heat in summer during flowering= double berry in fall
Floricane Varieties

Average Day of First Harvest and Peak Fruiting in Clarksville, AR

- **Natchez**: June 5; June 17
- **Osage**: June 8; June 26
- **Ouachita**: June 12; June 29
- **Navaho**: June 20; July 1
- **Apache**: June 25; July 6

Floricane

Osage

- The Newest Arkansas **Thornless** Blackberry
- 350-450 chilling hours
- Ripens (In Ark.) between Natchez and Ouachita
  - a COMPLEMENT TO OUACHITA
- Yields have been consistent and good, comparable to higher than Ouachita
- Berry size is medium, 5-6 g, slightly smaller than Ouachita
  - Good size-Packs really easy in smaller clamshells
- Great postharvest handling potential
Floricane

Osage

- Flavor is a key attribute of Osage, lower acid flavor with notable flavor components coupled with high soluble solids
- Good even on “bad flavor days” as noted by JRC over the years
- “The FLAVOR IS GREAT – BRING THAT ONE HOME!!” - J. Clark
- *This one is worth trying if you have not considered*
- About 300,000 plants sold thus far….fourth of the Arkansas varieties (Nat, Ouachita, PA 45)
Floricane

Ouachita

- **Thornless**
- Pronounced: WAH-CHA-TAH
- **The Arkansas Standard**
  - The most widely planted and adapted
- 400-500 hours chilling
- Consistent production year to year
  - *Not extremely early budbreak*
- Excellent shipping capability
- Over 1 million plants sold last three years
- *If you plant one Arkansas variety, plant this one*
Floricane

Natchez

- **Thornless**
- Fruit start out BIG
- 300 hours of chilling
- Earliness is the key, a week before Ouachita
  - breaks bud and blooms earlier, more risk?
- Very high yield potential, don’t let overcrop
  - *May be better managed with fewer floricanes*
- Can be tart early, can be the BEST also
- Large, fills the clamshell mighty quick
- Over 500,000 plants sold last three years
- Postharvest handling a little trickier, more reversion and softer than others; pick and handle early
Floricane

Von

- **Thornless**
  - Developed by Dr. Gina Fernandez, North Carolina State University, released 2012
  - In Salisbury NC,
    - Total yield 12,017 g/plant (24,063 lbs/acre).
    - **Marketable** yield 10,704 g/plant (21,434 lbs/acre).
  - 6.6 g berries, smaller drupelet and seed size
  - Late season production-
    - Average 1st harvest third week of June, peaking second week of July and ends the first week of August.
  - Good post-harvest quality
  - Soluble sugars 9.4% and pH was 3.57-sweet with low acid.
  - *May be worth trying out*
Primocane Fruiting Types

- ‘Prime-Jim®’ and ‘Prime-Jan®’
- ‘Prime-Ark® 45’
- ‘Prime-Ark® Freedom’
  - Thornless
  - Intended for home garden
- ‘Prime-Ark® Traveler’
  - Thornless
  - “Traveler” because of shipping quality
Primocane

Prime-Ark® 45 – Changing Blackberry Production

• Changed Blackberry Production
  – 1st primocane fruiting
  – late summer and fall blackberries in the US

• **Thorny**

• 300 hours chilling

• Large, productive; floricanes and primocanes (in moderate climates)

• Most popular on the west coast

• Sold over 1 million plants last three years

• *Make sure primocane fruiting blackberries work where you are...*
Primocane

Prime-Ark® Traveler

• The First:
  I. Primocane Fruiting
  II. Thornless
  III. SHIPPING-QUALITY Blackberry
• Medium size – 7 g
• 9-11% SS, reduced acidity
• Shipping potential for distant markets
• Target use is shipping, local markets and home gardens
Primocane

Prime-Ark® Freedom

- Floricane crop ripens 7-10 days before Natchez = *really early*
- Primocane berries up to 16 g in (cool places)
- Intended for home garden or local-market use
Primocane Variety Comparisons

Prime-Ark 45®
- Thorny
- 7-9 g berry; can be jumbo
- Yield often **higher**
- Nice flavor, *some* bitterness
- Double fruit tendency in heat

Prime-Ark® Traveler
- Thornless
- 7-8 g berry; uniform
- Yield equal to lower
- Nice flavor, **no** bitterness
- Double fruit **rare** in heat

- SS 10-12%, sub-acid
- Double tipping required
- Data indicate comparable reversion, leak and soft
# Florigane Yield Potential
## 45 vs Traveler – Arkansas Trials

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Yield (kg·ha⁻¹)</th>
<th>Wt./berry (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florigane harvest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prime-Ark® Traveler</td>
<td>13,057 a</td>
<td>13,283 a</td>
</tr>
<tr>
<td>Prime-Ark® 45</td>
<td>20,845 a</td>
<td>10,234 a</td>
</tr>
</tbody>
</table>

**Note:**

- comparable yields (kg/ha about the same as lb/acre)
- usually comparable berry weight
# Primocane Yield Potential

## 45 vs Traveler – Arkansas Trials

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<td></td>
<td></td>
</tr>
<tr>
<td>Prime-Ark® Traveler</td>
<td>4,963 a 7,568 a 10,287 a</td>
<td>4.7 a 6.4 a 5.3 a</td>
</tr>
<tr>
<td>Prime-Ark® 45</td>
<td>7,798 a 4,978 a 10,540 a</td>
<td>6.3 a 7.3 a 5.1 a</td>
</tr>
</tbody>
</table>

### Note:

- comparable yields (kg/ha about the same as lb/acre) statistically
- comparable berry weight
- higher PF yield in 2015 due to less heat in Arkansas
- *If PA 45 works, try PA Traveler*
Summary of temperatures (°F) at the Fruit Research Station, Clarksville, AR for 2012 through 2015 during the months of June through August.

<table>
<thead>
<tr>
<th>Year</th>
<th>Ave. high June, July, Aug.</th>
<th>Days above 90°F</th>
<th>Days above 95°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>90</td>
<td>68</td>
<td>42</td>
</tr>
<tr>
<td>2013</td>
<td>87</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>2014</td>
<td>85</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>2015</td>
<td>87</td>
<td>30</td>
<td>4</td>
</tr>
</tbody>
</table>
Yield of two primocane-fruiting and two floricane-fruiting blackberry varieties in replicated trials that were established in 2011 and 2012 at the University of Arkansas Fruit Research Station, Clarksville.

<table>
<thead>
<tr>
<th>Variety</th>
<th>2011 Planting (lbs/acre)</th>
<th></th>
<th></th>
<th></th>
<th>2012 Planting (lbs/acre)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prime-Ark® Traveler</td>
<td>9,827 c</td>
<td>20,003 c</td>
<td>8,767 b</td>
<td></td>
<td>11,649 cd</td>
<td>11,851 b</td>
<td>7,995 b</td>
<td></td>
</tr>
<tr>
<td>Natchez</td>
<td>26,047 a</td>
<td>32,514 ab</td>
<td>17,897 a</td>
<td></td>
<td>34,208 a</td>
<td>19,383 a</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ouachita</td>
<td>16,389 b</td>
<td>27,457 b</td>
<td>13,366 ab</td>
<td></td>
<td>20,567 bc</td>
<td>11,113 b</td>
<td>15,463 a</td>
<td></td>
</tr>
<tr>
<td>Prime-Ark® 45</td>
<td>18,170 b</td>
<td>28,374 b</td>
<td>10,638 b</td>
<td></td>
<td>18,597 bc</td>
<td>9,131 b</td>
<td>7,390 b</td>
<td></td>
</tr>
<tr>
<td><strong>Primocane harvest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prime-Ark® Traveler</td>
<td>0</td>
<td>3,842 b</td>
<td>6,673 a</td>
<td></td>
<td>4,428 a</td>
<td>6,752 a</td>
<td>9,178 a</td>
<td></td>
</tr>
<tr>
<td>Prime-Ark® 45</td>
<td>0</td>
<td>5,821 a</td>
<td>5,793 a</td>
<td></td>
<td>6,957 a</td>
<td>4,441 a</td>
<td>9,404 a</td>
<td></td>
</tr>
</tbody>
</table>

^2 Means in the same column within cane type followed by the same letter are not significantly different by t-test, $P \leq 0.05$. 
Where to buy plants?

- See handout for full list
- List not exhaustive; does not imply endorsement

<table>
<thead>
<tr>
<th>Propagator</th>
<th>Licensed Blackberry Cultivars</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Berries Unlimited</strong></td>
<td>Apache (PP #11,865)</td>
</tr>
<tr>
<td>(North American Honeyberry Corp.)</td>
<td>Chickasaw (PP #11,861)</td>
</tr>
<tr>
<td>807 Cedar Lane</td>
<td>Kiowa (PP #9861)</td>
</tr>
<tr>
<td>Prairie Grove, AR 72753</td>
<td>Natchez (PP #20,891)</td>
</tr>
<tr>
<td>Phone: 479-846-6030</td>
<td>Osage (patent pending)</td>
</tr>
<tr>
<td>Email: <a href="mailto:info@berriesunlimited.com">info@berriesunlimited.com</a></td>
<td>Ouachita (PP #17,162)</td>
</tr>
<tr>
<td>Website: <a href="http://www.berriesunlimited.com">www.berriesunlimited.com</a></td>
<td>Prime-Ark® 45 (PP #22,449)</td>
</tr>
<tr>
<td></td>
<td>Prime-Ark® Freedom (patent pending)</td>
</tr>
<tr>
<td></td>
<td>Prime-Ark® Traveler (APF-190T)</td>
</tr>
<tr>
<td><strong>Bramble Berry Farm</strong></td>
<td>Apache (PP #11,865)</td>
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<tr>
<td>PO Box 327</td>
<td>Chickasaw (PP #11,861)</td>
</tr>
<tr>
<td>Winslow, AR 72759</td>
<td>Kiowa (PP #9861)</td>
</tr>
<tr>
<td>Phone: 479-369-1705</td>
<td>Natchez (PP #20,891)</td>
</tr>
<tr>
<td>Fax: 479-369-1705</td>
<td>Osage (patent pending)</td>
</tr>
<tr>
<td>Email: <a href="mailto:pensewarren@yahoo.com">pensewarren@yahoo.com</a></td>
<td>Ouachita (PP #17,162)</td>
</tr>
<tr>
<td>Website: <a href="http://www.alcasoft.com/winfrey">www.alcasoft.com/winfrey</a></td>
<td>Prime-Ark® 45 (PP #22,449)</td>
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<td>Prime-Ark® Traveler (APF-190T)</td>
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<tr>
<td><strong>Boston Mountain Nurseries</strong></td>
<td>Apache (PP #11,865)</td>
</tr>
<tr>
<td>20189 N. Highway 71</td>
<td>Chickasaw (PP #11,861)</td>
</tr>
<tr>
<td>Mountainburg, AR 72946</td>
<td>Kiowa (PP #9861)</td>
</tr>
<tr>
<td>Phone: 479-369-2007</td>
<td>Natchez (PP #20,891)</td>
</tr>
<tr>
<td>Email: <a href="mailto:bostonmountainnurseries@centurylink.net">bostonmountainnurseries@centurylink.net</a></td>
<td>Osage (patent pending)</td>
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<tr>
<td><strong>Stark Bro’s Nursery and Orchards Co.</strong></td>
<td>Apache (PP #11,865)</td>
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<tr>
<td>P.O. Box 1800</td>
<td>Chickasaw (PP #11,861)</td>
</tr>
<tr>
<td>Louisiana, MO 63353</td>
<td>Kiowa (PP #9861)</td>
</tr>
<tr>
<td>Phone: 800-325-4180</td>
<td>Natchez (PP #20,891)</td>
</tr>
<tr>
<td>Fax: 573-754-3701</td>
<td>Ouachita (PP #17,162)</td>
</tr>
<tr>
<td>Email: <a href="mailto:info@starkbros.com">info@starkbros.com</a></td>
<td>Prime-Ark® 45 (PP #22,449)</td>
</tr>
<tr>
<td>Website: <a href="http://www.starkbros.com">www.starkbros.com</a></td>
<td>Prime-Ark® Freedom (patent pending)</td>
</tr>
<tr>
<td></td>
<td>Prime-Jan® (APF-8 cultivar)</td>
</tr>
<tr>
<td></td>
<td>Prime-Jim® (APF-12 cultivar)</td>
</tr>
</tbody>
</table>
Resources

Production Guides

2016 Southeast Regional Caneberry Production Guide

Sustainable Blackberries & Raspberries
A Self-Assessment Workbook for Growers

Budgets

Interactive Sustainable Blackberry Budget

Growers Association

www.cars.uark.edu

North American Raspberry & Blackberry Association
Amanda McWhirt
amcwhirt@uaex.edu
(501) 671-2229

www.facebook.com/UAEXfruitandveggie
@fruitveg_uasex

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