



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*

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
- Floricanne 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



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



June 15, 2006



October 6, 2006



June 8, 2007



August 18, 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 Jim

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-40 on August 23, 2007



APF-40 on August 18, 2007

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-41 on August 23, 2007

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-46

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

<i>Selection</i>	<i>Yield (lb/acre)</i>	<i>Berry weight (g)</i>
APF-27	1931 b	2.8 bc
APF-40	3180 a	3.9 a
APF-41	1738 b	3.7 a
APF-42	1974 b	2.2 de
APF-46	1677 b	2.6 cd
APF-77	2136 b	3.1 b
Prime-Jan®	2235 ab	3.2 b
Prime-Jim®	367 c	1.9 e
P-value	0.001	0.001
Significance	***	***



Prime Jim



APF-41



Prime Jan



APF-42



APF-27



APF-46



APF-40



APF-77

Harvest 2007

<i>Selection</i>	<i>First harvest</i>	<i>Mid point (half berry wt)</i>	<i>Last harvest</i>
APF-27	8/02	9/04	10/26
APF-40	8/06	8/27	10/26
APF-41	8/20	9/11	10/26
APF-42	8/06	9/06	10/26
APF-46	8/02	9/11	10/26
APF-77	8/02	9/24	10/26
Prime-Jan®	8/02	8/30	10/26
Prime-Jim®	8/02	8/27	10/26

(Frost)

Early Tasting Data From UK and KSU Events

N = 21

Selection	flavor	sweetness	bitterness	tartness
Prime Jan	3.0 ab	2.6 cd	3.2 ab	3.4
Prime Jim	2.7 b	2.4 d	3.4 a	3.3
APF-27	3.3 ab	3.0 abcd	2.6 abc	2.6
APF-40	3.6 a	3.2 ab	2.2 c	2.6
APF-41	2.9 b	2.6 cd	2.7 abc	3.1
APF-42	3.7 a	3.5 a	2.4 bc	2.7
APF-46	3.2 ab	2.8 bcd	3.1 ab	2.6
APF-77	3.6 a	3.1 abc	2.5 bc	3.0
sig	*	**	*	NS
	5=intense 1=mild	5=intense 1=mild	5=intense 1=mild	5=intense 1=mild

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 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?