



# Old, New and Future Blackberry Varieties

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# Blackberries have come a long way

- Trailing to erect
- Thorny to thornless
- Double blossom major limiting factor to manageable
- Floricane-fruiting only to Primocane-fruiting
- Viruses few to few too many
- Nursery plants not tested for viruses to testing common in reputable nurseries
- Limited season to year round availability
- Local markets only to shipping industry

# Trailing to erect



- Lucretia
- First popular, cultivated dewberry
- Trailing
- Found in WV

# Trailing Blackberry

- Crown forming
- Require trellis
- No summer pruning
- Thornless & thorny cultivars
- Main cultivars
  - Marion, Black Diamond, Obsidian, Kotata
- Raspberry x Blackberry hybrids
  - Logan, Boysen, Tayberry





# Semi-erect Blackberry

- Crown forming
- Must be trellised
- Summer tipping ~5'
- Commercially mostly wholesale fresh market
- Ripen Early August-Frost
- Generally roundish fruit w/ large, crunchy seeds, and often slightly bitter.
- Main cultivars:
  - Chester Thornless, Triple Crown





# Erect Blackberries

- Sucker like raspberry
- Minimal trellis
- Summer tipping ~4'
- Commercially mostly wholesale fresh market
- Ripen E. July – late August
- Generally roundish fruit with large, crunchy seeds, and often slightly to noticeably bitter.
- Main cultivars:  
Navaho, Ouachita



# Thorny to thornless

- Cherokee, Comanche....Shawnee, Chickasaw and Kiowas
- First thornless cultivar Navaho, 1989
- Ouachita, Natchez, Apache, Arapaho....



# Thorny blackberry



# APF-45

- A step forward and back?
- Primocane-fruited but thorny!



# Double Blossom as major limiting factor to minimal factor

- Fungus
- Double blossoms, shortened internodes, no or distorted fruit
- Cultural tactics
  - Plant thornless cvs.
  - Remove wild brambles from perimeter
  - Primocane prune through bloom
  - Alternate year bearing
- Chemical control somewhat effective



Floricanne-fruiting only to primocanne-  
fruiting cultivars



# Floricanne-fruiting only to primocane-fruiting cultivars

- Prime-Jim and Prime-Jan
- Prime-Ark 45
- Nipomo, CA, Oct 9, 2012



Viruses few to...too many

# Blackberry yellow vein disease

First observed in 2000 in the Carolinas.



Tested for known viruses (RBDV, TRSV etc) – Several viruses were found but none consistently associated with symptoms.

# New viruses in *Rubus* in the last decade

16 viruses & virus-like agents were known to infect *Rubus* before we started looking into *Rubus* complexes – We now have over 45...

## New *Rubus* viruses

*Blackberry yellow vein associated virus*

Blackberry virus E

Blackberry virus X

*Blackberry virus Y*

Blackberry virus Z

*Beet pseudo yellows virus*

*Blackberry yellow mottle virus*

*Blackberry chlorotic ringspot virus*

*Strawberry necrotic shock virus*

*Black raspberry necrosis virus*

*Raspberry leaf mottle virus*

Rubus canadensis virus -1

*Impatiens necrotic spot virus*

*Raspberry latent virus*

etc.....

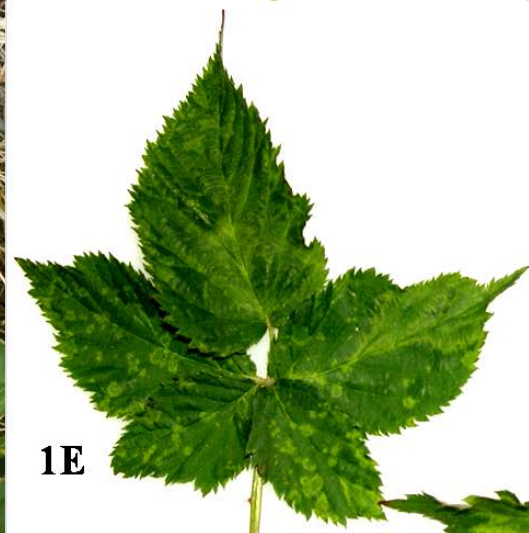


# Same disease-different viruses

**AR**



**MS**



**NC**



# Nursery plants not tested for viruses to testing as standard

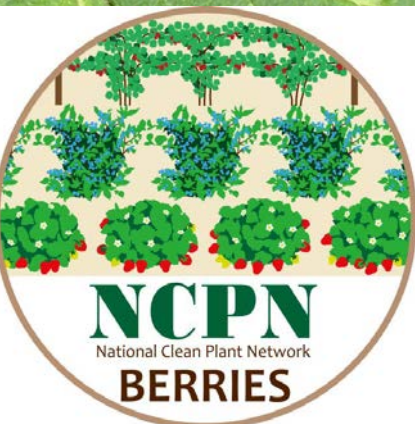
- NCPN developing standard for entire country for all berry crops



# The team

## The berry virus consortium:

16 individuals from UA, NCSU, USDA-ARS, MSU, UGA



United States Department of Agriculture  
National Institute of Food and Agriculture



Limited season to year round  
availability  
and

Local markets to year round shipping



# Blackberries in markets



# Blackberry Varieties Recommended

- Blackberry
  - Floricane fruiting types
    - Arapaho, Natchez, Ouachita and Navaho
    - Von and Osage newer so trial only
  - Primocane fruiting types
    - APF-45
    - Freedom (newest)

# Arapaho

- Characteristics
  - Thornless
  - Early
  - Low yield
  - Semi erect/erect
- Comments
  - Earliest yet low yield
  - Plant closer than others



# Ouachita

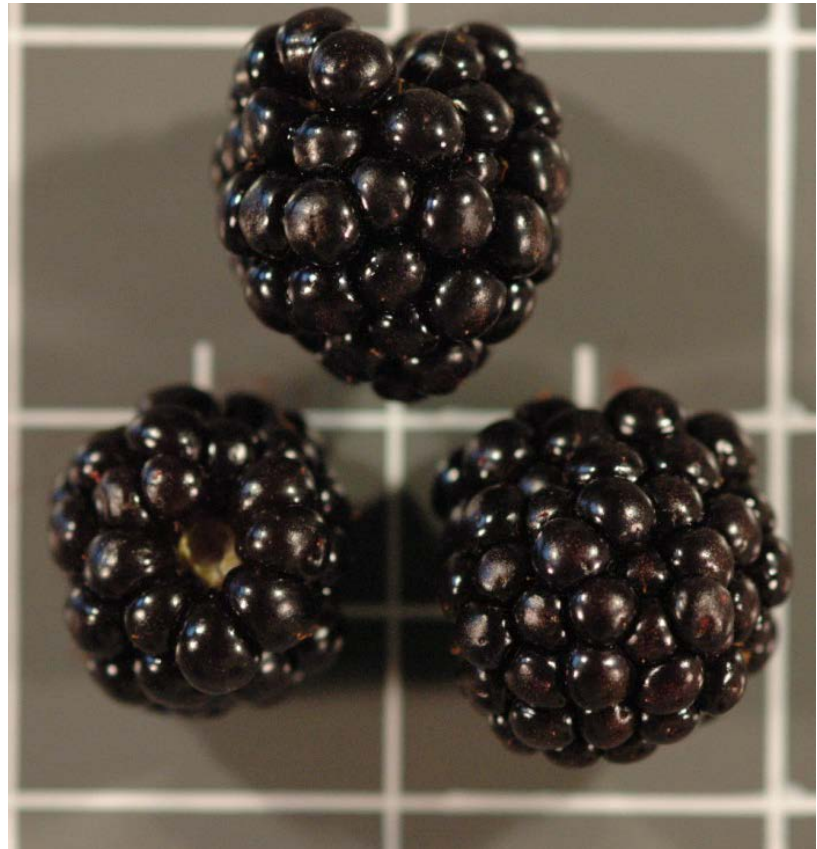
- Characteristics
  - Thornless
  - High yields
  - 6-7 g
  - Great flavor
  - Good post harvest shelf life (PH)
- Comments
  - Shiny berries taste good





# Osage– The Newest Arkansas Blackberry

- Ripens (In Ark.) between Natchez and Ouachita, ave. June 10 beginning harvest
- Yields have been consistent and good, comparable to higher than Ouachita
- Berry size is medium, 5.0 g, slightly smaller than Ouachita
- 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
- Great postharvest handling potential



# Osage– Why Consider?

- A complement to Ouachita in size and season to diversify cultivars for this harvest period
- Consistently uniform in drupelet fill whereas Ouachita can have uneven fill
- Is hoped to expand on flavor and enjoyment of blackberries by consumers
- Available in 2013 from tissue culture propagators, wider availability in 2014



# Navaho

- Characteristics
  - UArk
  - Thornless
  - Mid-late season
  - Med-high yield
  - PH great
- Comments
  - Orange rust susceptible
  - If you want only one variety for a home garden, this is the one







# Von







# Von

- ‘Von’ is a new erect, thornless, floricanefruiting blackberry.
- ‘Von’ was selected in 1998 by J. R. Ballington.
- Replicated trials of ‘Von’ PRS in Salisbury, NC in 2007 and at the UMRS in Laurel Springs, NC in 2009.



**Yield of six blackberry cultivars grown in Salisbury NC, 2008-2010.**

**Table 1a. Total yield (g/plant).**

Cultivar	2008	2009	2010	Mean 2008-10
Apache	5460b	9321b	5690cd	6824b
Arapaho	3539c	4200c	3901d	3880c
Natchez	3735c	6003bc	7535bc	5758bc
Navaho	9882a	12813a	10143bc	10946a
Von	4962bc	13488a	17602a	12017a
Ouachita	5721b	6259bc	4008d	5329bc

**Mean harvest dates for blackberry cultivars in NC,  
when yields were at 5, 50 and 95 percent total yield  
during 2008-2010.**

Cultivar	5%	50%	95%
Apache	26-Jund	12-Julcd	3-Augcd
Arapaho	6-Juna	15-Juna	3-Jula
Natchez	9-Junab	24-Junab	13-Julab
Navaho	24-Juncd	16-Juld	9-Augd
Von	22-Juncd	7-Julcd	2-Augcd
Ouachita	16-Junbc	1-Julbc	23-Julbc

# What About Natchez?

- Issues have been:
  - Variation from great flavor to tart
  - Excessive crop (due to huge crop potential plus very large berries) leading to:
    - Few primocanes
    - Reduced quality (tart, less postharvest storage potential, particularly reddening)



# Are There Natchez Solutions?

- Crop control
  - Be very careful about keeping cane length regulated in pruning
    - Don't let main/terminal canes grow excessively long
    - Make sure laterals are shortened to 15 to 20 inches in dormant pruning
    - I suspect some have found Natchez harder to manage due to it being less erect lateral shoots can grow excessively long and pruning effort greater

# What About Primocane-Fruiting Varieties?

- Floricane crop being used by some growers as is early (near Natchez) and very firm with good quality
- Can floricane yields be substantial? Yes – the less PC crop the year before, the greater the FC crop potential
- Try APF 45 first

# ‘Prime-Ark<sup>®</sup> 45’

- Primocane fruiting, Thorny
- Good yields
- Large fruit, 9.3 g
- Fair flavor, sweet with mild bitter aftertaste.
- Firm, crunchy/seedy
- Ripens mid-September to mid October
- Easy to manage
- **Concerns:**
  - **Quality**
  - **Yield**
  - **What does it give you over semi-erects like Chester Thornless?**
  - **Need to raise in tunnels**



# The Absolute Newest Thing From Arkansas - ***Prime-Ark® Freedom***

The First Primocane-Fruiting Thornless,  
***EVER!!!***



- LARGE – 9-12 g
- 9-11% SS
- Does not appear to have shipping potential
- Target use is local markets and home gardens



## *Prime-Ark<sup>®</sup> Freedom*

- FC crop ripens 7-10 days before Natchez – really early
- Huge primocane crop in California – a cooler location...
- Primocane berries up to 16 g in (cool places)



# What's next?

- Crispy!
- Heat tolerant PF blackberries?

# Winter Injury in Caneberries

# “Winter” Injury

- Cause: cold temperatures
- Time of year, different symptoms:
  - Spring, late frost: death of flower buds
  - Fall, early frost: terminate fruiting on primocane fruiting cultivars
  - Winter, very cold temperatures: kill canes, damage roots
  - Late dormant season, fluctuating winter temperatures: cane and/or bud damage



# Critical temperatures

	Winter	Spring*
Blackberry	+5 to -20 F	28 – 30F
Raspberry	-20 to -30 F	28 - 30F
Black raspberry	-5 to -10 F	28 – 30F
Purple raspberry	-15 to -20 F	28 – 30F
Blueberry	-20 to -30 F/0 to -10	21 – 31F
Strawberry	6-10 F	22 – 31F

# Fall injury





# Winter injury

**Blackberry winter injury**



**Raspberry winter injury**



# Winter injury

- Will kill floricanes but not new primocanes
- Not always apparent until fruiting laterals begin to grow
- Injured vascular tissue is damaged





# Winter injury

**Bud damage**



**Cane damage**



# Spring injury



# Practices for Reducing Freeze Damage

- **Plant**
  - on north facing slopes to avoid fluctuating winter temperature effects
- **Pruning**
  - Delay pruning as long as possible, extremities usually more susceptible to damage
- **Row covers**
  - Rowcovers placed over RCA trellies berries will protect western Caneberries in midwest.

# Practices for Reducing Freeze Damage

- **Avoid Cultivation**

- Cultivation in late winter and early spring tends to increase freeze damage.
- Soil temperature on a radiation-frost night will be much warmer than air temperature.
- If the soil has been cultivated, the surface layer will contain more air and less water.
- With less water, the surface layer will hold less heat.
- Also, the increased soil air will cause the surface layer to be a better insulator which will decrease the amount of heat released from deeper in the soil.
- Bushes will probably stay 1 to 2 °F warmer on uncultivated soil than on cultivated soil.



# Practices for Reducing Freeze Damage

- **Maintain Soil Moisture**

- By increasing the amount of water in the soil, the soil will absorb more heat during the day and conduct more heat to the surface for plant protection
- Excess water for extended periods must be avoided to prevent flooding or phytophthora root rot damage

- **Sprinkler Irrigation**

- not recommended





# Resources

- Southern Region Small Fruit Consortium
  - [www.smallfruits.org](http://www.smallfruits.org)
  - Quarterly newsletter, chores, production guides
- Blackberry and Rapsberry Portal
  - [www.rubus.ces.ncsu.edu](http://www.rubus.ces.ncsu.edu)
  - General production info, yield data, post harvest data
- Team Rubus Blog <http://teamrubus.blogspot.com>
- Team Rubus Facebook
- Twitter @NCteamrubus
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# Thanks!



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