Small Fruit Trial Update: Spring 2023

Specialty Crop Block Grant- 2021-2023- Bumgarner, Lockwood, (Luckett)

Blueberry Funding from Southern Region Small Fruit Consortium- Lockwood, Bumgarner, Hansen, Velandia, Sykes, Rose

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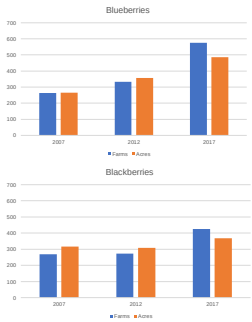
Berries in TN
2017 USDA Census of Ag

- Blueberries- 576 farms/474 acres
- Blackberries- 426 farms/368 acres

- Average of 0.84 acres in production



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Sample Budget for Blueberry Production Under Various Integrated Pest Management and Marketing Strategies – 2020

The objective of this sample budget is to guide blueberry producers and those interested in producing blueberries on the factors to consider when estimating their production and marketing costs. Additionally, this sample budget helps users evaluate changes in costs associated with two integrated pest management (IPM) strategies (i.e., low and moderate), and three marketing strategies (i.e., 100% Ready retail, 50% U-Pick and 50% Ready Picked retail, 75% U-Pick and 25% Ready Picked retail).

The Excel-based blueberry sample budget Excel tool allows users to select different scenarios associated with plant density, IPM and marketing strategies.

- Sample Budget for Blueberry Production Under Various Integrated Pest Management and Marketing Strategies - 2020
- Blueberry sample budget Excel tool

For additional information, contact Margarita Velandia or Becky Bowling.

Sample Budget for Blackberry Production Under Various Integrated Pest Management and Marketing Strategies – 2022

The objective of this sample budget is to guide blackberry producers and those interested in producing blackberries on the factors to consider when estimating their production and marketing costs. Additionally, this sample budget helps users evaluate changes in costs associated with two integrated pest management (IPM) strategies (i.e., none and conventional fungicide program), and three marketing strategies (i.e., 100% Ready retail, 50% U-Pick and 50% Ready Picked retail, 75% U-Pick and 25% Ready Picked retail).

3

Blueberry Cultivar Trial Overview

- Two sites- MTREC, NETREC
- 12 cultivars in total
- Rabbiteye, N. Highbush, S. Highbush
- Now in ground 1 or 3 years
- Fruit in 2022, but light, so no yield data yet

4

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June 2020

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Management notes

- Pre-plant pH management
- Irrigation installed immediately after planting
- Fertilizer (Ammonium sulfate applied 2-4x yearly)
- Spot weed mgt with herbicide
- Some irrigation challenges in late 2021-mid 2022

9

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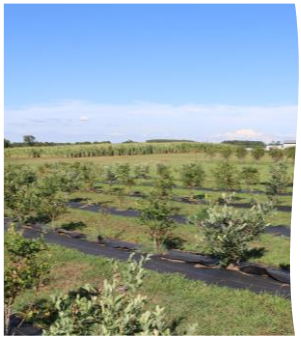


MTREC Blueberry Trial Darwinian Data

Duke- 75% distressed
Blue Ray- 75% distressed
Toro- 75% distressed
Northern Highbush quality stand count= 25%

Legacy- 0% distressed
Reveille- 0% distressed
New Hanover- 25% distressed
Southern Highbush quality stand count= 92%

Premier- 8% distressed
Titan- 8% distressed
Ochlocknee- 0% distressed
Rabbiteye quality stand count= 94%

11

12

Project Goals

- ❑Cultivar evaluation- production and management
- ❑ Cultivar evaluation- consumer preference
- ❑Training and resources for agents and TN producers

13

Trial Overview

- 10 initial and now 11 cultivars
- Floricane and primocane fruiting
- RCA as well as T, V and other trellis demonstrations
- 4 reps

14

Caneberries

Floricane-bearing

- Primocane:
  - Cane elongation to fruit bud initiation
- Floricane:
  - Fruiting to death

Primocane-bearing

- Primocane grows, branches & fruits in upper portion in late summer & fall

2nd yr. of cane life

- Fruiting on lower portion of cane in early summer if left on plant
- Plan to initially manage this trial as a double crop but vary management in future efforts

15

16

17

18

Floricane Bearing- Standards

- Ouachita (thornless)
- Mid season
- Consistent producer, widely adapted
- Likely largest in production area commercial currently (~400-500 hours)

19

Floricane Bearing- Standards

Kiowa (thorny)

- Mid-season, but long harvest
- Large fruit, good storage and handling
- Lower chilling (200-300 hours)

Natchez (thornless)

- Early season
- Large fruit, high yield (may overproduce)
- Early bloom, lower chilling (~300 hours)

20

Floricane Bearing- Other Options

- Osage (thornless)
  - Between Natchez and Ouachita
  - Flavor is good- low acid, high SS
  - 350-400 hours
- Von (thornless)
  - Later season
  - NCSU introduction, doing well in WNC
  - Clean plant, no orange rust
  - Good post-harvest quality (~800 hours)

21

The Sweet-Ark™

Caddo (thornless)

- Good health
- Flavor is key - 10% or more soluble solids (measure of sugars), aromatic, 1% acidity

Ponca (thornless)

- Comparable yields to Osage and Ouachita
- Vigor
- Flavor is big asset- can have 13% or more soluble solids
- Low acid
- Both around ~400 hours

22

Floricane Cropping Pros and Cons

- Wide selection- many older and newer cultivars available
- May have higher yield capacity than primocane fruiting

- May require more time in pruning
- May require more time in sanitation and disease management

23

The Prime-Ark™

Prime-Ark 45 (2009)

- Thorny, erect canes
- Late summer and fall bearing
- Floricane yields near floricane cultivars
- ~300 hours

Prime-Ark Traveler

- Thornless
- Med sized, firm berry, good for shipping

24

The Prime-Ark™

Prime-Ark Freedom (2013)
- Large fruit, soft berries
- Floricane yields earlier than Natchez

Prime-Ark Horizon (2021)
- Thorny
- Long primocane fruiting period
- Slightly earlier than PA 45

25

Primocane Cropping Pros and Cons

- Simple pruning for single crop
- This can also be beneficial in sanitation
- Possible earlier harvest on floricanes

- We need to better understand yield potential
- We are still learning the management nuances

26

Management notes

- Pre-plant pH management not needed
- P and K sufficient
- Irrigation installed at planting
- So far, only N fertilizer applied
- Time spent in plant mgt

27

Summer 2022- First Harvest Season

28

29

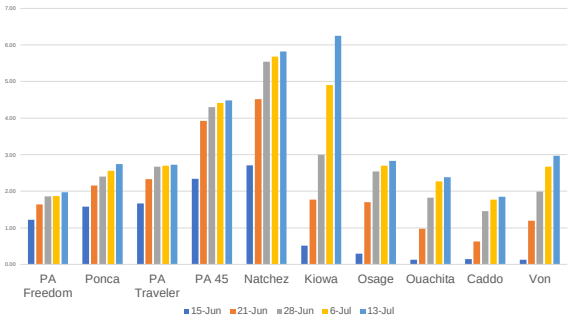
2022 Yield- 3 field replications for 5 weeks

Kiowa- 2.6x
Natchez- 2.4x
PA 45- 1.9x
Osage- 1.2x
Von- 1.2x
Ponca- 1.2x
PA Traveler- 1.1x

Ouachita- 1.0

Caddo- 0.8x
PA Freedom- 0.8x

30



31

Fruit Size (grams)

- Kiowa 9.2
- Caddo 6.2
- Natchez 5.8
- Ouachita 5.4
- Ponca 5.3
- Von 4.8
- Osage 4.5
- PA Freedom 4.3
- PA 45 4.2
- PA Traveler 3.8

32

Sensory Evaluation Data Snapshot by Cultivar

- Two harvest dates in June
- Took 200 berry samples back to Knoxville
- Sensory panels of over 100 participants

33

Ouachita

Overall Opinion (0-9)	6.0 ± 0.2
Flavor Intensity (0-15)	8.9 ± 0.4
Sweetness	0.3
Sour	0.5
Bitter	0.3
Seedy	0.5
Bland ↑	*0.2*
Firm	0.3
Juicy	0.6
Large	0.2

34

Von

Overall Opinion (0-9)	6.1 ± 0.2
Flavor Intensity (0-15)	8.9 ± 0.4
Sweetness	0.4
Sour	0.5
Bitter ↑	*0.4*
Seedy	0.5
Bland	0.1
Firm	0.3
Juicy	0.7
Large	0.2

35

Osage

Overall Opinion (0-9)	6.7 ± 0.2
Flavor Intensity (0-15)	9.4 ± 0.3
Sweetness	0.6
Sour	0.4
Bitter ↓	**0.2**
Seedy	0.5
Bland	0.1
Firm	0.3
Juicy	0.6
Large ↓	*0.2*

36

Natchez

Overall Opinion (0-9)	6.7 ± 0.2
Flavor Intensity (0-15)	9.2 ± 0.3
Sweetness	0.4
Sour ↑	*0.6*
Bitter	0.3
Seedy	0.4
Bland	0.1
Firm	0.4
Juicy	0.6
Large	0.6

37

Prime Ark Traveler

Overall Opinion (0-9)	6.8 ± 0.2
Flavor Intensity (0-15)	8.6 ± 0.3
Sweetness	0.4
Sour	0.3
Bitter ↓	**0.2**
Seedy	0.5
Bland ↑	*0.2*
Firm	0.4
Juicy	0.6
Large ↓	*0.1*

38

Kiowa

Overall Opinion (0-9)	6.8 ± 0.2
Flavor Intensity (0-15)	9.8 ± 0.3
Sweetness	0.5
Sour	0.5
Bitter	0.3
Seedy	0.3
Bland	0.06
Firm ↓	**0.2**
Juicy ↑	**0.8**
Large ↑	**0.8**

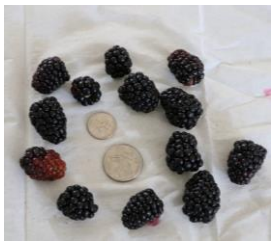
39

Prime Ark 45

Overall Opinion (0-9)	6.9 ± 0.2
Flavor Intensity (0-15)	8.8 ± 0.3
Sweetness	0.4
Sour	0.4
Bitter	0.3
Seedy	0.4
Bland	0.1
Firm	0.4
Juicy	0.6
Large	0.3

40

Ponca



Overall Opinion (0-9) ↑	7.2 ± 0.1
Flavor Intensity (0-15)	9.2 ± 0.4
Sweetness	0.5
Sour	0.4
Bitter ↓	**0.2**
Seedy	0.4
Bland	0.1
Firm ↑	**0.5**
Juicy ↑	**0.7**

41

Caddo

Overall Opinion (0-9) ↑	7.2 ± 0.2
Flavor Intensity (0-15) ↑	**9.9 ± 0.3**
Sweetness ↑	**0.6**
Sour	0.5
Bitter ↓	**0.2**
Bland ↓	**0.01**
Seedy ↑	*0.6*
Firm	0.4
Juicy ↑	0.8
Large	0.6

42

Very Early Thoughts

- Cultivars bred for taste seem to have taste tested well
- Some encouraging overlap between early yield trends and consumer preferences
- We may be looking at the opportunity to select different cultivars for customer types just as we do for yield times

43

Next Steps

- Install more plants at NETREC
- Complete trellis comparisons
- Focus on 2023 yield collection
- Also participating in SRSFC fertility trial, so lots of leaf tissue data has been taken

44

Big Picture Plans

- More yield data on floricane and primocane across regions
- More trellis evaluation
- Marketing studies integrated with sensory evaluations

45

A Small Survey on Small Fruits

- UT Extension small fruit survey for 2023
- Focused on blackberry and blueberry growers, growing area and needs

46