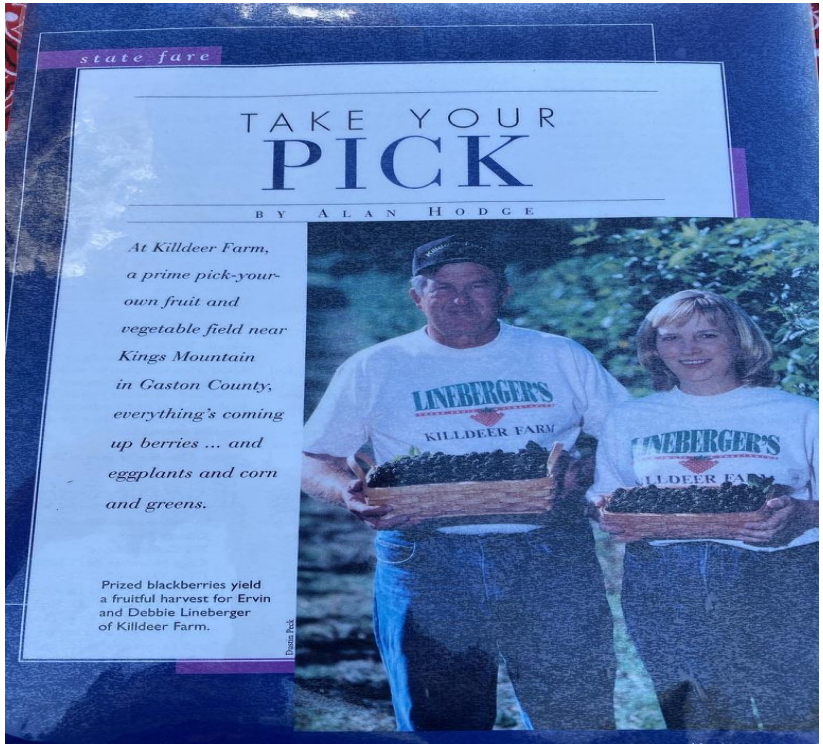
NC STATE UNIVERSITY

The Caneberry Industry in North Carolina

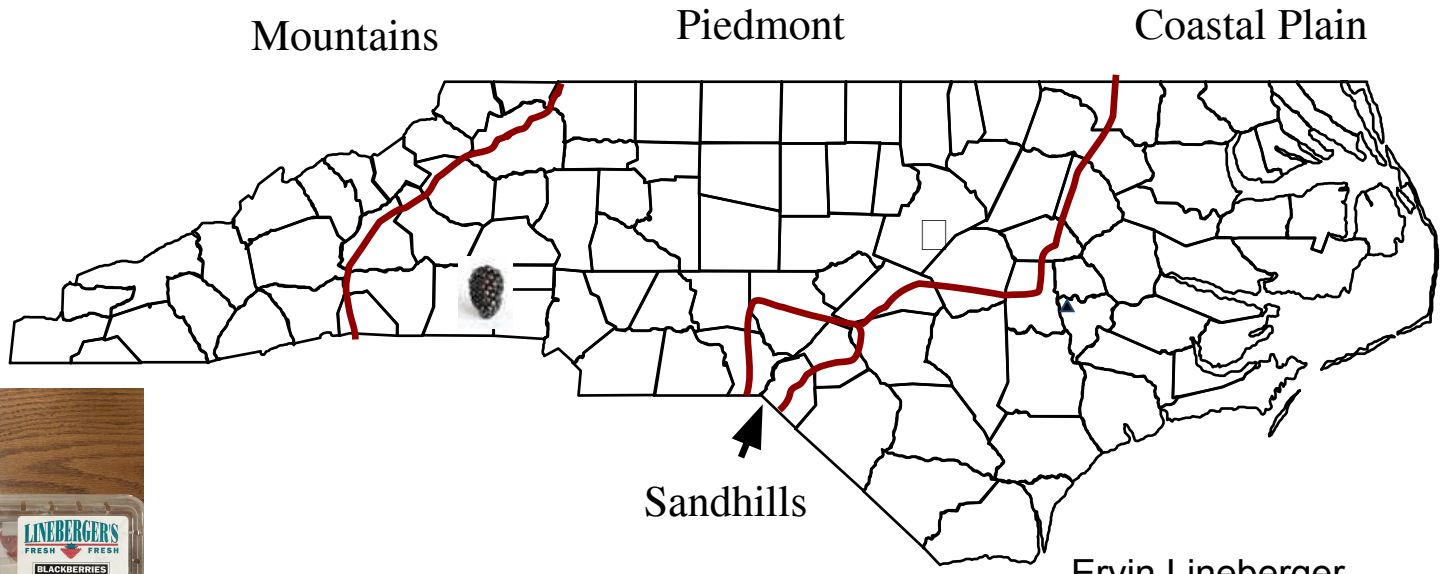
Gina Fernandez, NCSU

Blackberry, a new industry for NC?

- 1996
- 100? Acres
- Thorny cultivars mostly
- Double blossom was a problem
- New thornless cultivars from Arkansas not grown



Caneberry industry 1996



Ervin Lineberger
Largest blackberry grower in NC
Kiowa primary cultivar

The Miracle Berry

Want to stop aging, live longer, and keep your mind sharp? Make BLUEBERRIES a habit!

by Holly McCord, RD
Photography by Hilmar

If you add one food to your diet this year, make it blueberries. Calorie for calorie, luscious blueberries have recently emerged as the single most ferocious food in the supermarket at halting the forces that age you. Even the scientists who study blueberries are excited.

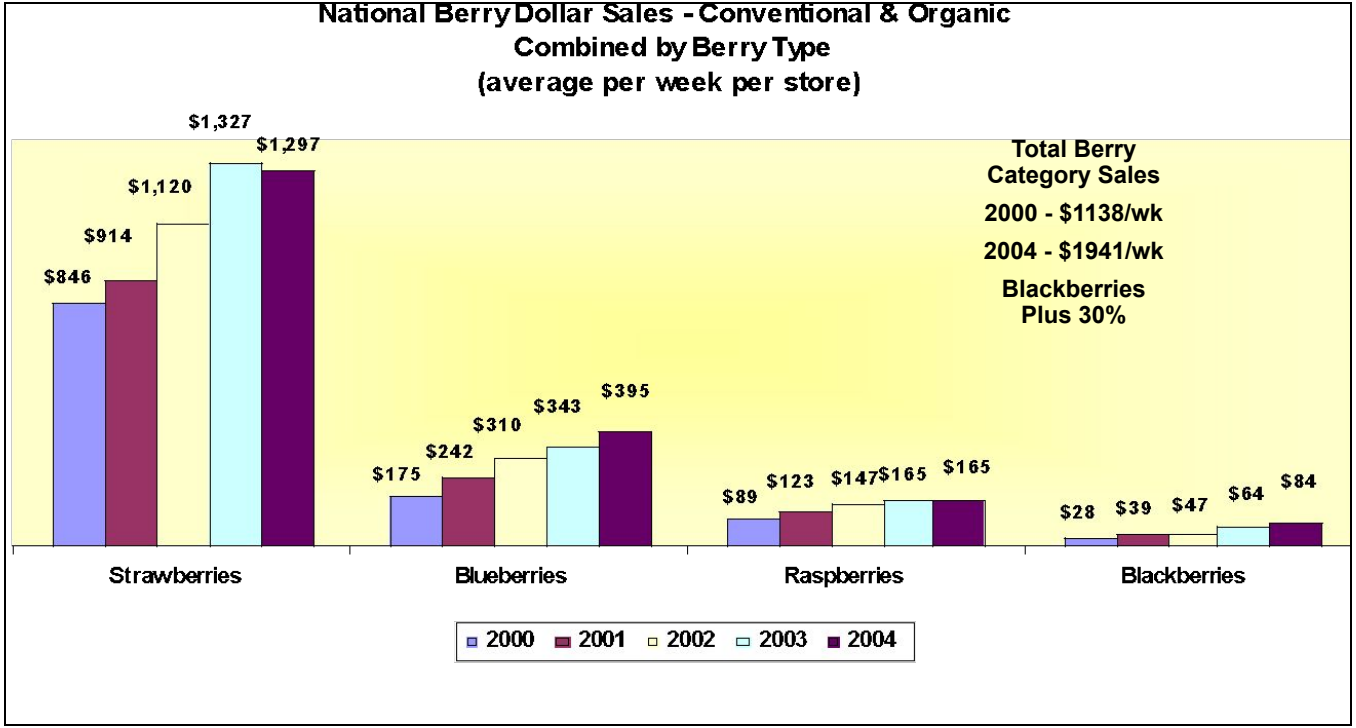
Radical Resistance

Every second of your life, your cells are bombarded by dangerous particles called free radicals. In a split second, they can alter your DNA in ways that cause cancer. Or change LDL cholesterol (the bad cholesterol) so it sticks to artery walls. Or damage collagen and make skin wrinkle-prone. Over time, changes such as these accelerate your aging.

Fortunately, you can fight back. The trick is to load your diet with antioxidants—the natural zappers of free radicals—by eating lots of fruits and vegetables. And that's

Sip this Wild Purple Smoothie—and fight aging!

Industry Status 2000-2004



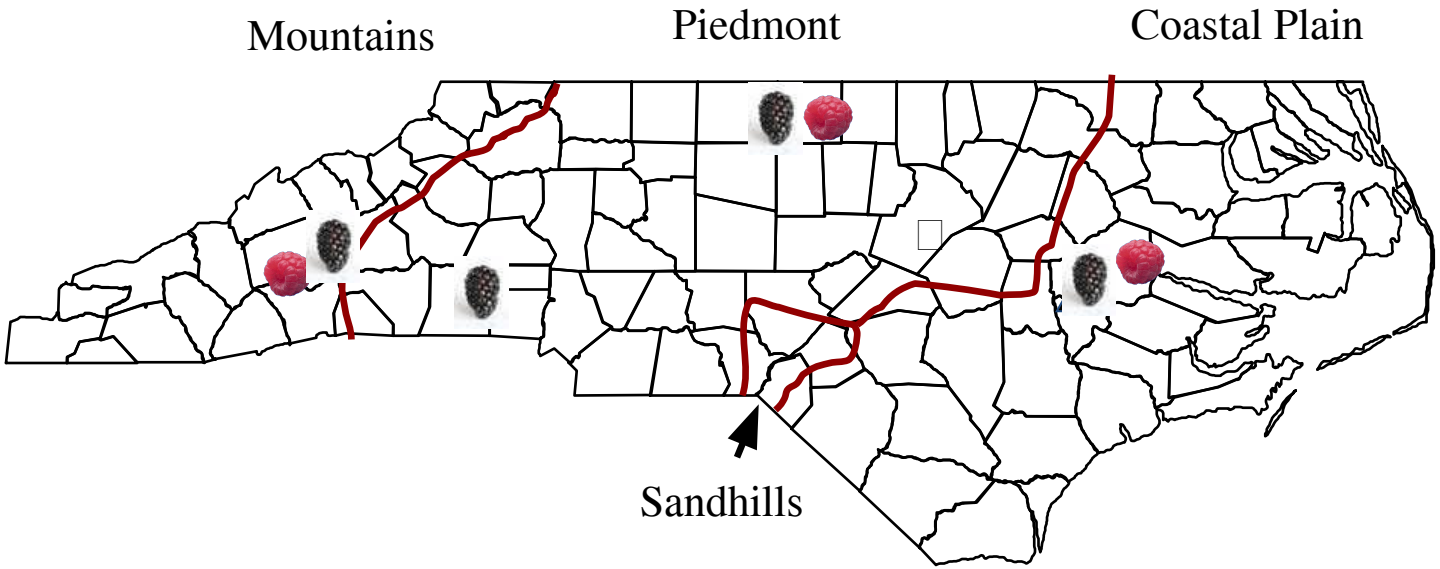
Timing ideal for new industry

- Berry consumption/sales increasing
- Tobacco industry changing NC agriculture
  - Buyout 2005-2014
  - Growers looking for alternative crops before buyout
- University of Arkansas thornless cultivars
  - Navaho, Arapaho, Apache, Ouachita

Double Blossom

- *Cercosporella rubi*
- Limited production in NC
- Resistant cultivars: erect thorny types
- Navaho 1988
- DOUBLE WIN

Caneberry trials



Cultivar trials

- 1997-2000
  - Raspberry do well in the mountains
  - Blackberries do well everywhere, especially the University of Arkansas cultivars
  - Season is in July/Aug

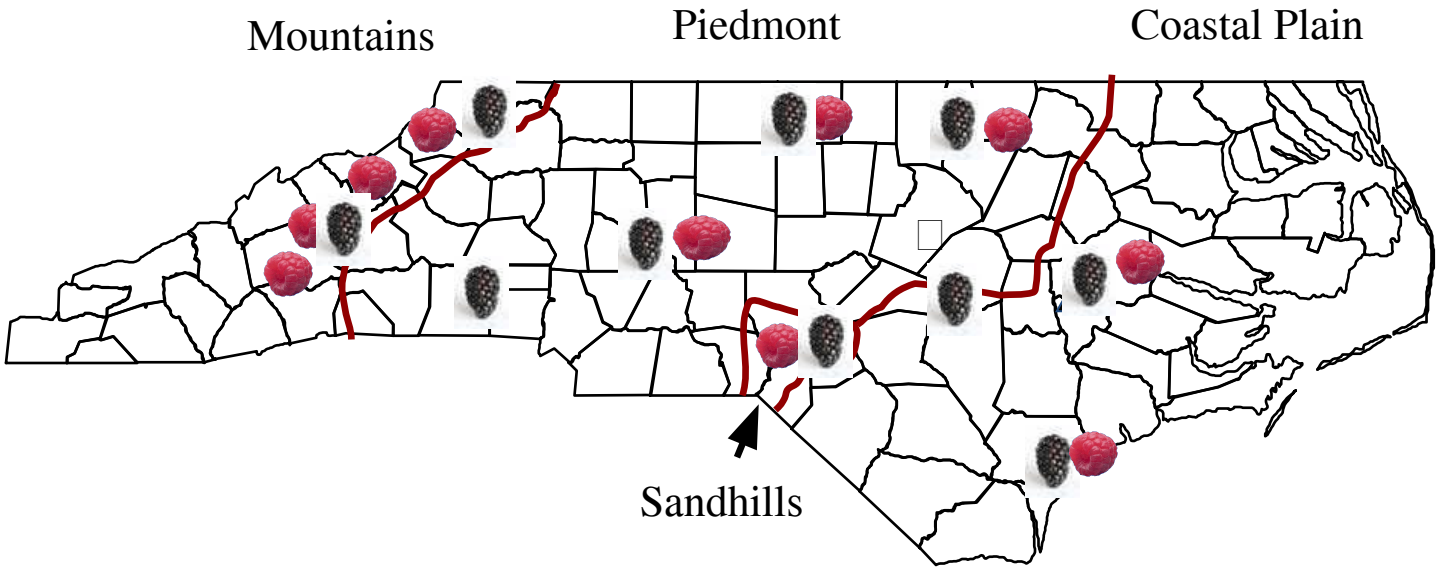
Viruses

- First noticed on farms and research stations 2000
- Standard practice of nurseries was to propagate plants in the field
- Survey conducted 2001 NCSU (Guzman, Pesic Van Esboreck)
- 3 viruses found at that time… 40+/- now
- Many years of research

Virus situation 2024

- NCPN-Berries: NCSU, UARK, UC-Davis, USDA-ARS OR
- NCPN: Provide high quality clonally propagated berry plant material, tested free of known pathogens that cause economic loss
- Nurseries propagate plants via tissue culture and growers now have access to clean plants

More trials across the state



Funded by Tobacco Trust Fund
to Jeff Chandler/NCDA&CS and NCSU Research Stations

"New" cultivars from UArkansas could be shipped!

NOTE

HortScience 32(1):132. 1997.

Air Shipment of 'Navaho' Blackberry Fruit to Europe is Feasible

Penelope Perkins-Veazie and Julie K. Collins
U.S. Department of Agriculture, Agricultural Research Service, South Central Agricultural Research Laboratory, P.O. Box 159, Lane, OK 74555

John R. Clark
Department of Horticulture, University of Arkansas, Fayetteville, AR 72701

Lawrence Risse[1]
U.S. Department of Agriculture, Agricultural Research Service, European Marketing Research Center, Rotterdam, The Netherlands

Additional index words. Rubus spp., shelf life

Currently, about 60% of blackberry fruit (*Rubus* spp.) production in the eastern United States is pick-your-own and most of the remainder is marketed locally. With a 50% projected expansion of blackberry plantings (Clark, 1992), there is a need for new market development. Blackberry fruit are being shipped by air to the United States and Europe from Guatemala, Chile, and Costa Rica, and within Europe from Italy and Spain. The European market windows for blackberries are from late May to late June, and from August to November. Europe is a potential market for blackberries produced in the southern United States, as the blackberry harvest season is from early May to mid-July in this region.

Blackberries have a very short shelf life (Hardenburg et al., 1986). Fruit firmness at research laboratory in Lane, Okla. Remaining clamshell containers were placed into picnic coolers containing ice and cooled from the ambient air temperature of 30 to 35 °C at harvest to 7 to 10 °C during the 3-h transport by van to the Dallas-Fort Worth International Airport. A broker at the airport packed four flats of berries into styrofoam containers containing 10 kg ice substitute (Blue Ice; Rubbermaid, Wooster, Ohio), 12 kg dry ice, and a 7-d recording thermometer (Marathon Temperature Recorder Co., Modesto, Calif.).

Fruit were airfreighted to Rotterdam, The Netherlands; received by a broker; and transferred to the USDA–ARS European Marketing Research Center in Rotterdam. The temperature range during air transit was –0.5 to 1 °C. Twenty-four clamshells per shipment were and clamshells were the replications. Analysis of variance was used with a factorial combination of location and storage interval. Means were separated by the Ryan–Einot–Gabriel–Welsch multiple F test (REGWF; Schlotzhauer and Littell, 1987), at $P \leq 0.05$.

Fruit quality did not differ after 7 d between exported fruit and fruit held at Lane as long as berries were held constantly at 2 °C upon arrival (Table 1). Holding fruit 2 days at 20 °C following cold storage accelerated berry mass loss at both destinations. In comparison with fruit held at Lane, decayed and leaky fruit were more common and the percent marketable fruit was lower in exported fruit after 2 d at 20 °C following cold storage. Increased handling and temperature fluctuations during export apparently accelerated deterioration of shipped berries after storage at 20 °C.

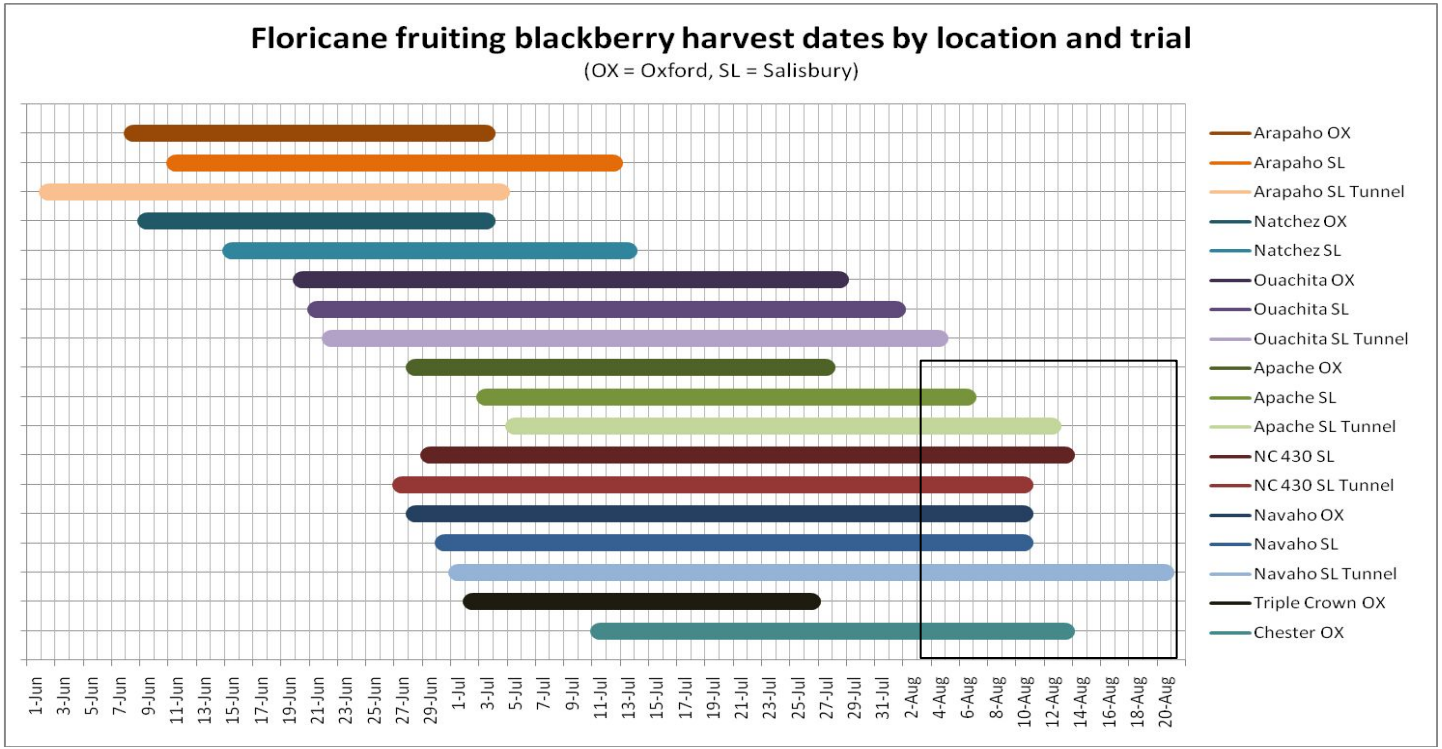
'Navaho' fruit sent on the first shipment were considered highly acceptable by the fruit broker, being firm and sweet (10% soluble solids concentration), and they compared favorably with shipments from Spain and Italy. Fruit damage occurred when the clamshells opened during transit and the fruit were crushed. In the second shipment, fruit were sent on a Friday and were left at air temperature (20 °C) for ≈30 h after arrival. The fruit broker considered the majority of the fruit to be too soft to be marketable.

The unusually good storage life of 'Navaho' fruit indicates suitability for export. The accelerated decay, leakage, and weight loss of fruit shipped to Europe following storage at 20 °C illustrates that proper temperature control, handling, and packaging during all phases of transit and distribution will be essential for

Tunnel and field trials

CLEAN PLANTS

Floricane-fruiting Blackberry Harvest Season Tunnels +/-

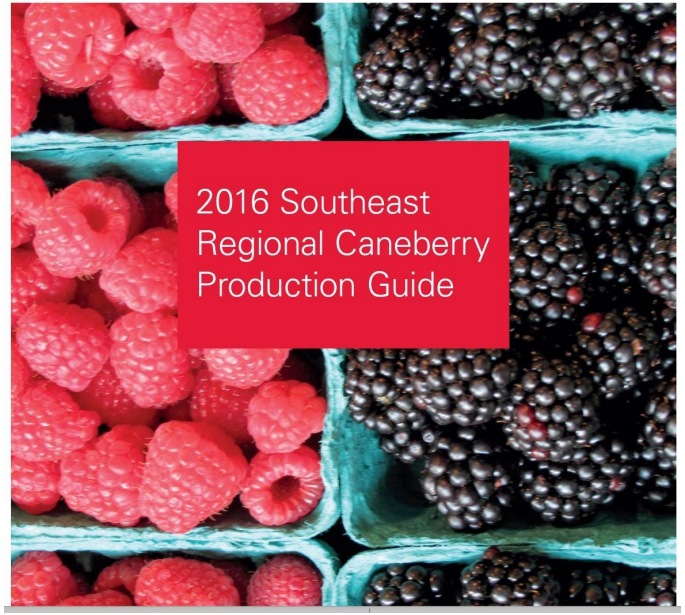


Sunny Ridge Farm

- Growers in MX and GA wanted to extend their season
- Meet with NC/SC growers 2005
- Large scale plantings in 2006
- Linebergers 2005
- First multi-farm harvest in 2007

Build a caneberry industry through Extension, cultural studies and breeding

- Grower meetings
- Agent trainings
- On farm trials
- Budgets
- Production guides
- Diagnostic tools
- Fertility surveys/recommendations
- Nursery industry/NCPN
- New UArk cultivars!



International Rubus and Ribes Symposium 2015

- 190 people
- 26 countries
- Put NC on the Rubus map!

Current status 2024

- 900/1000 + acres
- North Bay, Naturipe, Driscolls, Wish Farms, others
- Western NC production in ground, eastern NC under tunnels
- University of Arkansas and proprietary cultivars
- Western NC ‘Von’ doing well

Lewis Farm, Rocky Point NC

Rhodes Farm, Hendersonville NC

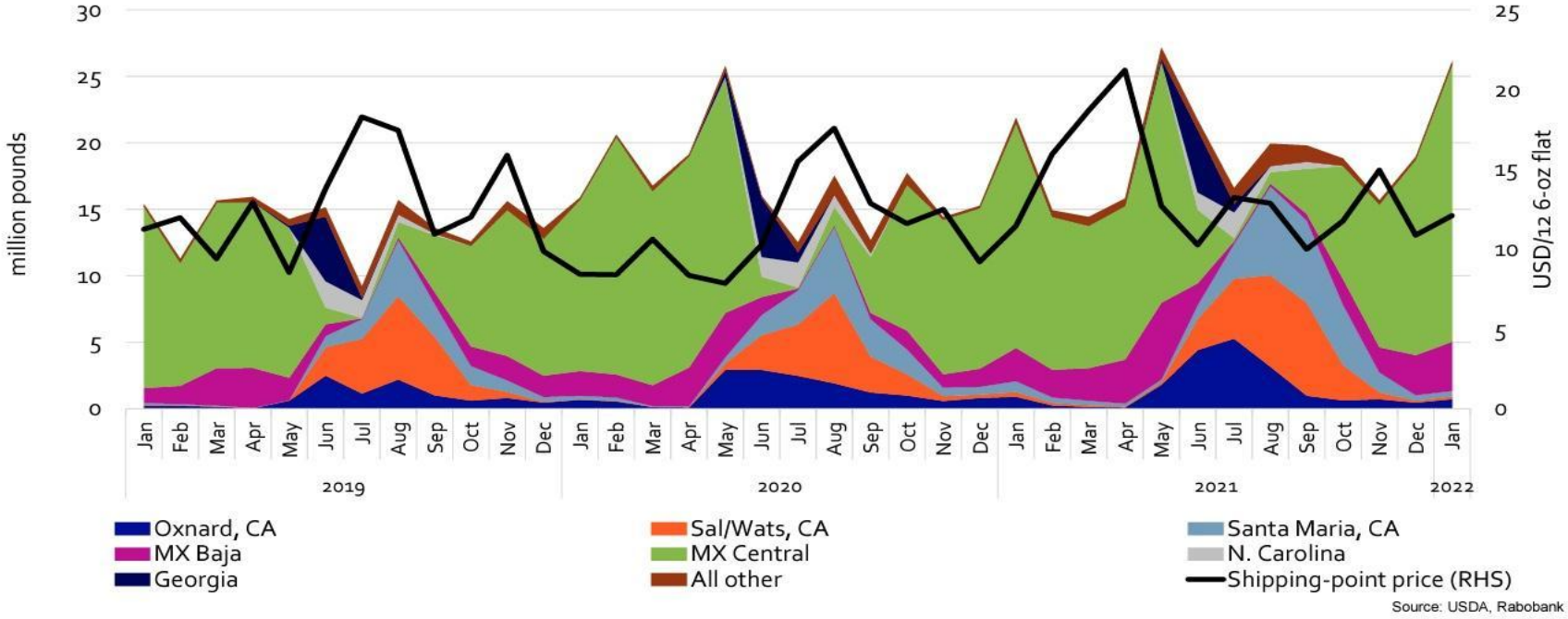
Current status 2024

- $12M + annual cash value
- 80% is fresh market, wholesale
- 20% is fresh market, local sales
- A small percent of each market processes fruit for wine, jams, or other uses

James Webb, Wish Farms, Shelby NC

Rabo AgriFinance

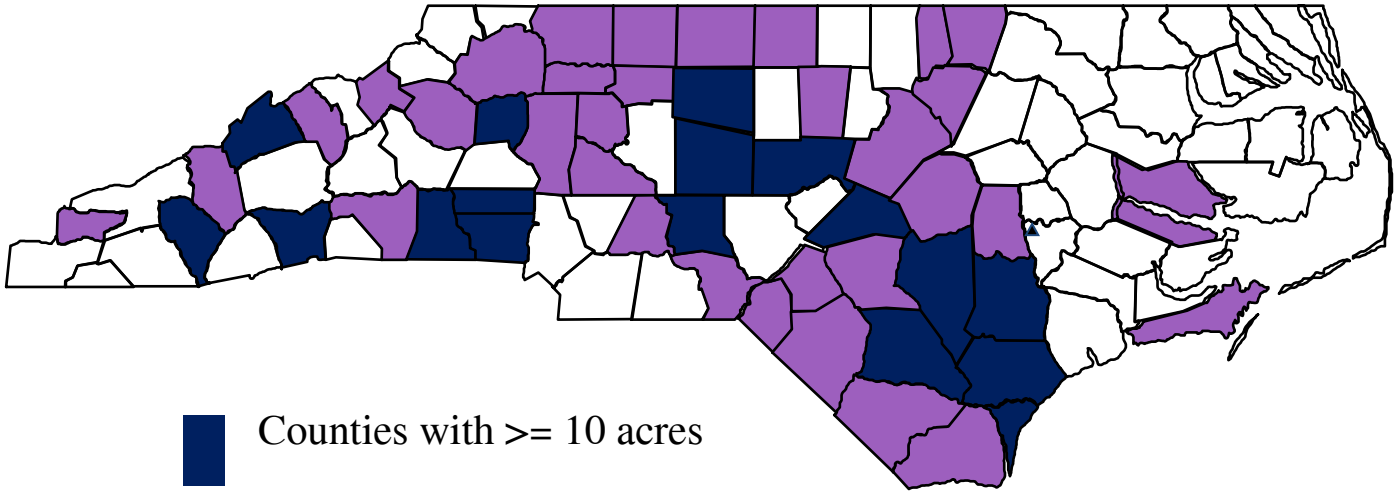
Fresh blackberry shipment to the US market



Source: USDA, Rabobank 2022

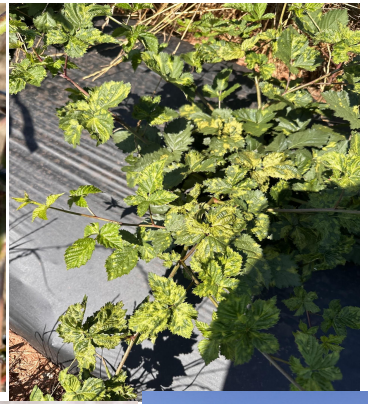
Counties with Blackberries in North Carolina 2022

Heat map developed for the Blackberry Pest Management Strategic Plan



Current blackberry challenges






- Labor
- Spring cold injury to flowers
- Pests
  - SWD, borers
  - Cane dieback, viruses, Gnomonia
  - Fusarium
- Heat during harvest

Raspberry Trials

Rubus breeding plots, Piedmont Research Station, Salisbury NC

- NC has several environments
- Raspberries do best in the mts
- Through breeding we have improved raspberry plant adaptation to heat

Raspberry breeding plots, Upper Mountain Research Station, Laurel Springs NC

But heat is still an issue

TUESDAY, JULY 26, 2011

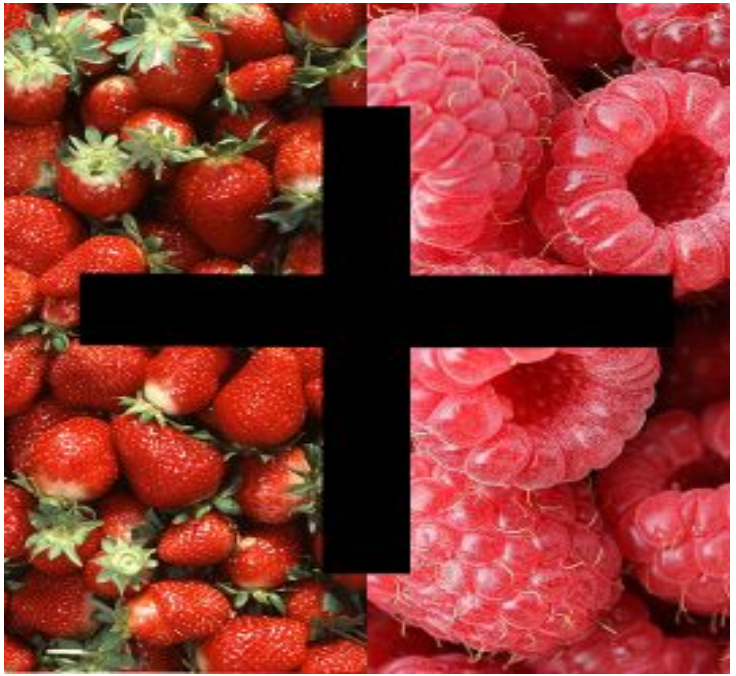
Heat stress in raspberries, part 2

So, many of you are probably thinking "Why would anyone try to grow raspberries in a hot, humid environment like North Carolina?" Well, you are not the only one that has had that thought. There are several points that I want to make in regard to this idea.

- Fruit quality still a problem during summer heat

Is there another way?

- Can we produce raspberry fruit at the same time as strawberries?
- Increase fruit offerings in early spring?
- Produce all 4 berries on one farm?



On-farm long cane raspberry research

Cal Lewis (grower cooperator) and Gina Fernandez (NCSU Professor)

Lisa Rayburn, NCSU Extension agent and graduate student

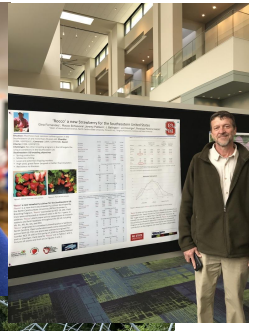
Another ”new” crop for NC?

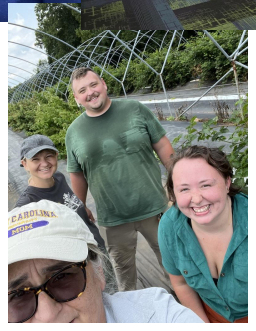
- Yields are good
- Pine bark works and is produced locally
- More later in this program…

Thank you students, technicians, post docs, agents







- Laura Butler
- Michelle Grabowski
- Tania Guzman
- Mary Helen Ferguson
- Lisa Rayburn
- Brianna Haynes
- Calyssa Stevenson
- Ramon Molina Bravo
- Christine Bradish Cash
- Guillermo Chacon
- Jessica Spencer
- Amanda McWhirt
- Katie Sheehan Lust
- Hannah Lepsch
- Absalom Shank
- Rocco Schiavone
- Ian Mellon
- Olga Lialiuk
- Karen Blaedow

NC STATE Horticulture
Innovative Education, Research & Extension

Thank you!

NC COOPERATIVE EXTENSION
N.C. A&T STATE UNIVERSITY
NC STATE UNIVERSITY

the Southern Region small fruit consortium

NORTH CAROLINA CANEBERRY ASSOCIATION

NARBA
North American Raspberry & Blackberry Association

SUPER SWEET! SUNNYRIDGE

NORTH BAY PRODUCE

Dole
Dole Berry Company

NC Specialty Crop Block Grant Program

RESEARCH STATIONS DIVISION
Working Together for One Cause
NC DEPARTMENT OF AGRICULTURE
NC STATE UNIVERSITY

TriEst Ag Group, Inc.

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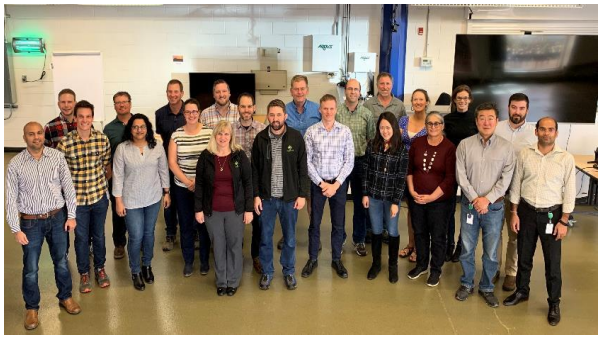
Nursery and Farms, Inc.

Golden LEAF FOUNDATION

USDA

North Carolina
Tobacco Trust Fund Commission

Thank you Institutional Cooperators



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Thank you Growers

- Ervin and Debby Lineberger
- Cal Lewis
- Jeff Crotts
- Dalton Rhodes
- Wayne Mitchem
- The Packs
- Steve Dalton
- Ethan Lineberger
- Harold and Patsy
- Wayne Mitchem
- Brent Brown

NABGA…NARBA

North American Bramble Growers Association (NABGA) founded in 1985

North American Raspberry and Blackberry Association (NARBA) 2008

Year	Location
1985-2008	?
1999	Orlando
2009	Grand Rapids
2010	Monterey
2011	Savannah
2012	Sandusky
2013	Portland
2014	Hershey
2015	Fayetteville
2016	Williamsburg
2017	Grand Rapids
2018	Ventura
2019	Savannah
2020	St. Loius
2021	Virtual
2022	Virtual
2023	Tampa
2024	Wilmington!

Welcome to North Carolina!