

Starting a muscadine vineyard: considerations on materials and other important decisions

Cain Hickey

July 9, 2019



UNIVERSITY OF GEORGIA
EXTENSION



Outline

- **Site selection**
 - Site preparation
- **Cultivar selection**
- **Material considerations**
 - Planting
 - Managing
- **Time and labor budgeting**
 - First two years
vs
 - Rest of vineyard life



Site selection – what to consider

- **Best for vineyard:**

- Sloped, **convex** land
- Higher than surrounding land

- **Best for winery:**

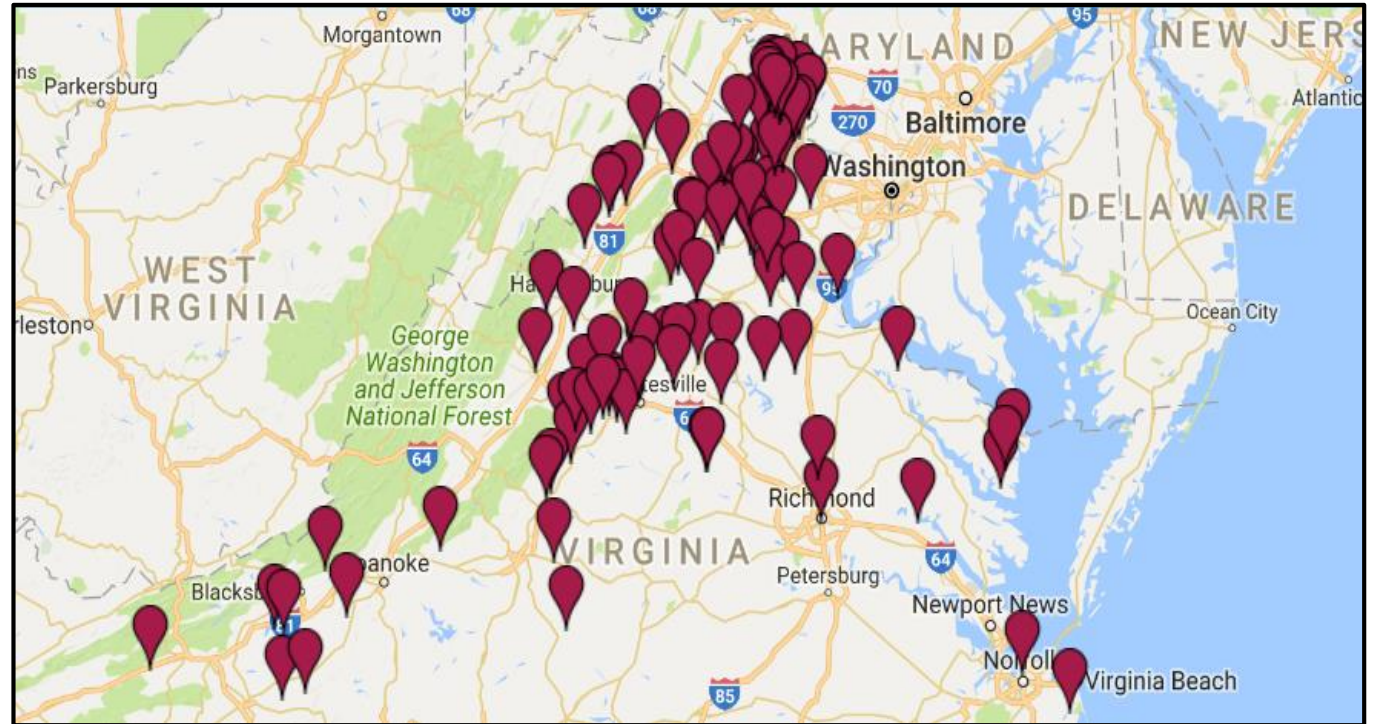
- Location to people/traffic

- These sites can be, but are often not, the same location

Bad



Good



Should I put my winery and vineyard on same site?

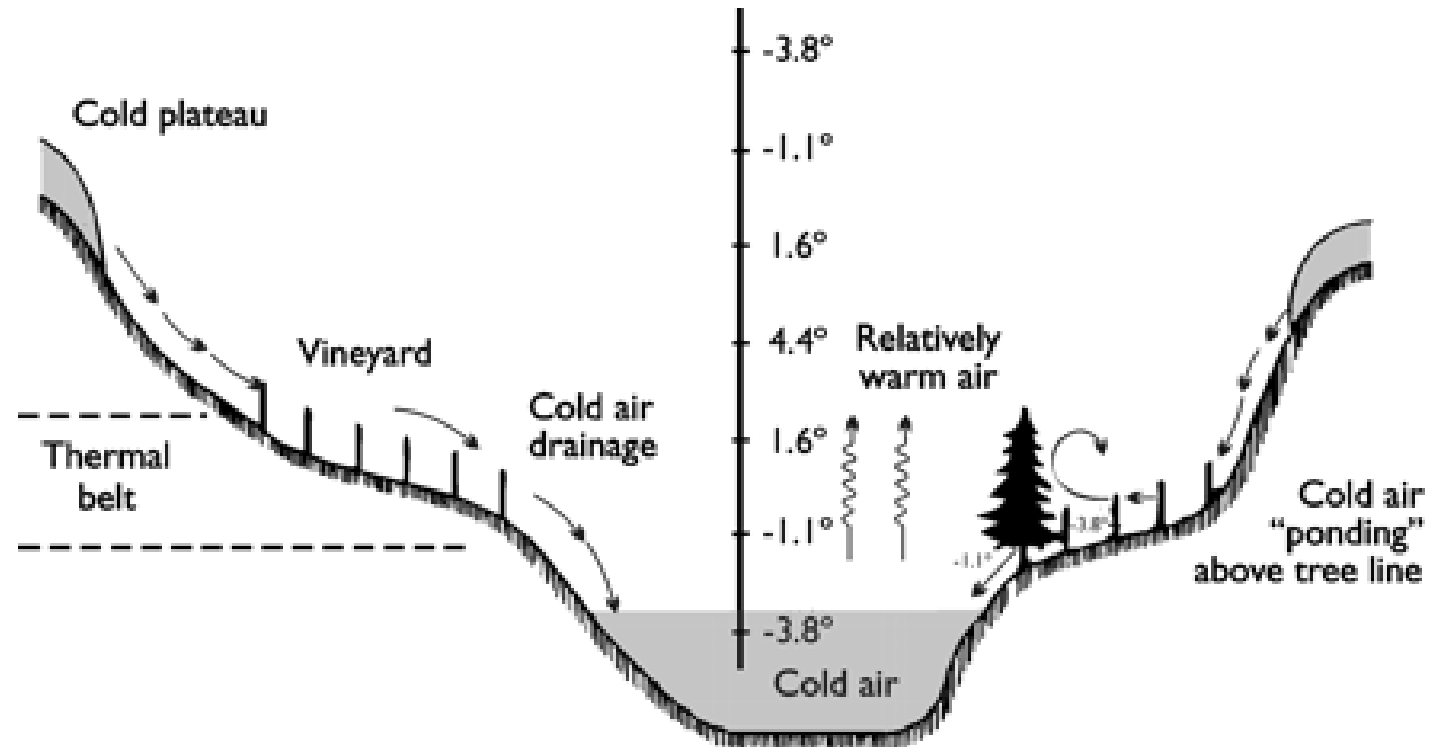
- Easy / practical answers:
 - I already have my site and am going to make both work.
 - May have to be more selective re: cultivars
 - Money is not an issue and I'll find the best site(s) for both.
 - I am only growing grapes
 - I am only putting in a winery
- Is the site good for a winery?
 - Close to high densities of people?
 - Close to other wineries?
- Is the site good for a vineyard?





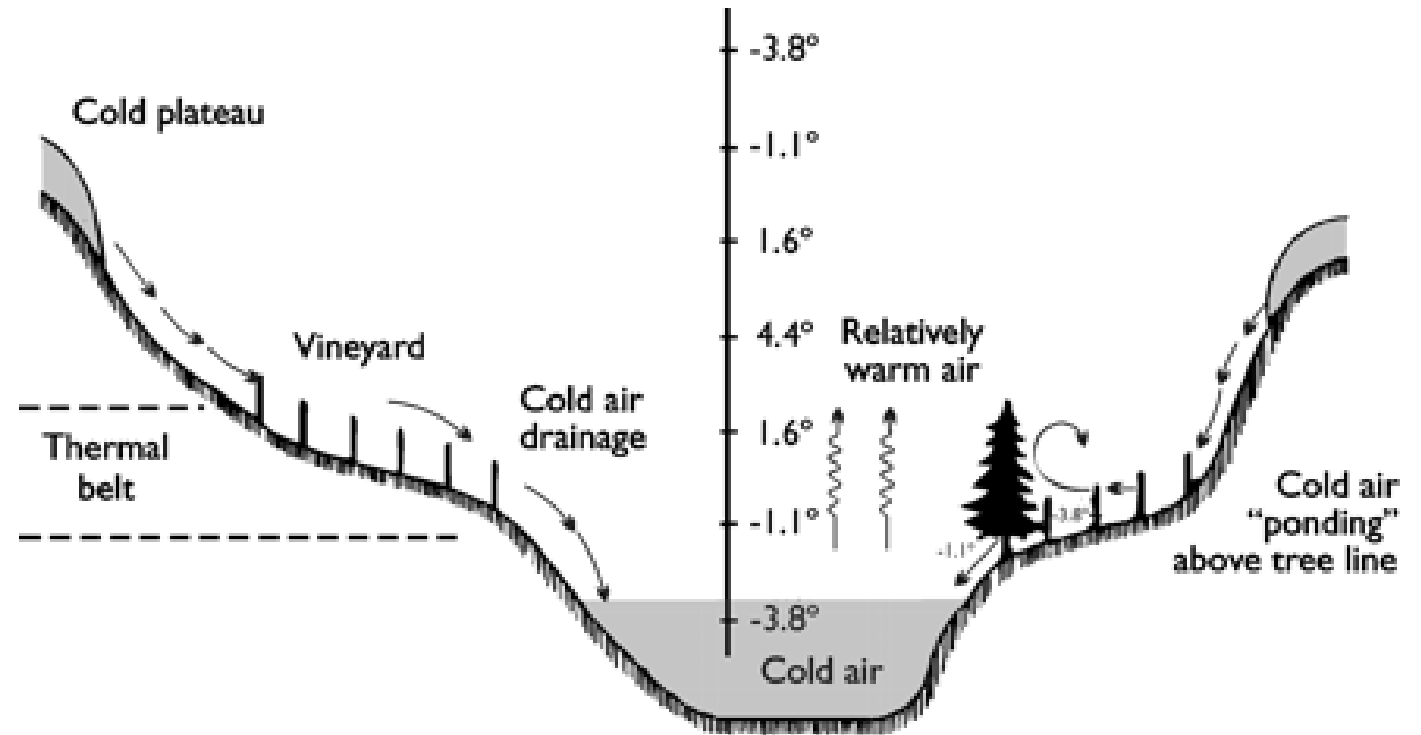
Why are convex landforms superior to concave landforms?

- Can reduce spring frost risk
- Especially:
 - radiational cooling periods
 - (cool, calm nights)



Air (wind) / water movement

- Vines do not like water
 - Except in years 1-2.
- Our humid climate provides enough water
 - Increases vegetative growth and disease severity.
- Ample air movement dries vines; reduces disease



Cultivar considerations...



**... need I say
anything about how
important this is?**

Thought process when choosing cultivars

- 1. Will it “work” in the vineyard?
 - Does it survive (cold)
 - Does it produce crop (frost)
 - Does it produce an economical crop?
 - Is it RELATIVELY disease tolerant?
 - Does it ripen to acceptable composition (primary, secondary)?
- 2. Can I sell it?
 - Single varietal wine
 - Blend
 - Fresh market
 - Other value added products



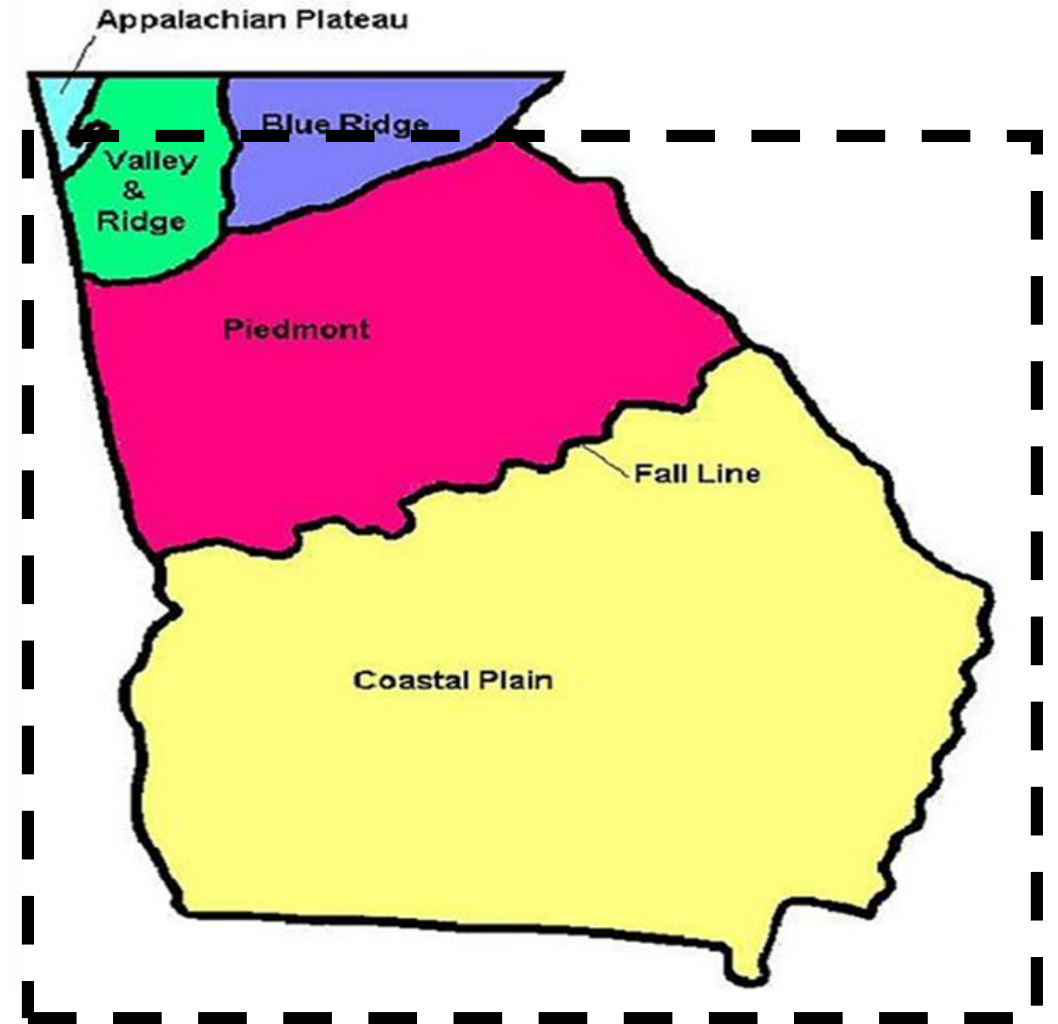
Cultivar considerations

- Does crop value exceed production costs?
- Where (altitude / latitude) are you going to grow vines?
- What will best suit my vineyard location?
- How many resources do I have for taking care of my vines?
- Are you willing to take risks?
- What wine styles are you aiming for?
- What is your market?



Muscadine production for fresh market and wine

- Wine (commercial and home)
 - Two cultivars dominate
 - Others can be used
- Fresh market (commercial and home)
 - SEVERAL cultivars to choose from
 - Flower-type can drive decisions
 - Female
 - Self-fertile



Muscadine grapes – largest acreages in Georgia

- Fresh market

GRAPE	ACRES	VITIS
Magnolia	30	rotundifolia
Higgins	23	rotundifolia
Supreme	15	rotundifolia



- Juice / wine / processing

GRAPE	ACRES	VITIS
Carlos	256	rotundifolia
Noble	137	rotundifolia

Not just sweet (Chateau Elan – MuscaDry, etc.)



Muscadine – commercial / home wine

- Carlos (bronze)
- Noble (purple)
- Largest acreages in GA and NC
- Very adaptable
- Self-fertile
- Very vigorous and productive
- Small berries with relatively thin skins
 - Make good adaptability for winemaking equipment



Muscadine – commercial / home fresh market

- Bronze
 - Female:
 - Fry, Early Fry, Pam
 - Self-fertile:
 - Granny val, Tara, Triumph, Late Fry
- Purple / Black
 - Female:
 - Supreme
 - Self-fertile:
 - Nesbitt, Cowart, Ison, Delicious



Patrick Conner

<http://www.caes.uga.edu/extension-outreach/commodities/muscadine-grape-breeding/cultivars/fresh-market-cultivars.html>

Scenarios where cultivars can be multi-purpose *(mainly with fresh market cultivars)*

- Wolf Creek Plantation
- Woodmill Winery
- Lineberger (NC)



- **Noble and Carlos are singular in purpose (processing):**
 - High crop yields
 - Small berries and relatively thin skins make processing easy
 - Nearly impossible for fresh market due to small berry size

Note about flower type – primarily a concern for fresh market cultivars

- Fry, Supreme – female
- Hall, Paulk – self fertile



Male

Perfect

Female

- Planting density –
 - Pollinator (self-fertile) needed every other row to pollinate female-flowered cultivars



Fry



Hall

UGA's breeding program (Patrick Conner)

- **ALL SELF-FERTILE**
- Hall (bronze)
 - Large berries, good producer
- Lane (purple)
 - Large berries, somewhat low producer
- Paulk (purple)
 - Self-fertile 'Supreme' substitute?
 - Growers are excited about this one
 - I am, too



Farming (i.e. growing grapes) is a business



Does crop value exceed production costs?

- **Production costs per crop produced:**

- *Fresh market*

>

- Juice/processing



- **Crop value (per unit weight):**

- *Fresh market*

>

- Juice/processing

Crop yield matters

- Carlos and Noble are highly productive and resilient.
- Other cultivars are not...
- Where can information regarding yield be found?
 - Talk to industry members who have experience growing many different cultivars
 - PC's website (next)





 <https://muscadines.caes.uga.edu/>



[CHOOSING A CULTIVAR](#)

[PRESENTATIONS AND PAPERS](#)

[RELATED LINKS](#)

[CONTACT](#)

Improving the muscadine grape

Started in 1909, the UGA Muscadine Grape Breeding program has released over 30 cultivars.

[Juice Cultivars](#)

[Fresh Market Cultivars](#)

Choosing a Cultivar

CAES / Muscadine Grape Breeding / Choosing a Cultivar / Juice Cultivars

Juice Cultivars

Juice Cultivars evaluated at Tifton, GA

Click on the cultivar name for more details and pictures of the berries.

Cultivar	Flower Type	Berry Color	Harvest Period	Berry Size	Productivity ^a	% Dry Scar
Carlos	Self-fertile	Bronze	Midseason	Small	90%	90%
Doreen	Self-fertile	Bronze	Late	Small	90%	60%
Golden Isles	Self-fertile	Bronze	Late	Large	110%	10%
Magnolia	Self-fertile	Bronze	Midseason	Small	90%	60%
Noble	Self-fertile	Purple	Midseason	Small	100%	30%

Choosing a Cultivar

Juice Cultivars

[Carlos](#)

[Doreen](#)

[Golden Isles](#)

[Magnolia](#)

[Noble](#)

[Regale](#)

[Sterling](#)

CAES / Muscadine Grape Breeding / Choosing a Cultivar / Fresh Market Cultivars / Supreme

Flower type = Female
Berry color = Black
Year introduced = 1988
Variety protection = Patent expired

Alachua

Cowart

Darlene

Delicious

Dixieland

Early Fry

'Supreme' was released by Ison's nursery in 1988. Plant patent #7267, July 10, 1990. The listed pedigree is 'Black Fry' x 'Dixieland'.

'Supreme' is the primary black colored fresh fruit cultivar in south Georgia. 'Supreme' has a very large berry size and good flavor. Among 'Supreme's' primary quality attributes are a crisp edible skin, and a firm pulp.

Choosing a Cultivar

CAES / Muscadine Grape Breeding / Choosing a Cultivar / Fresh Market Cultivars

Fresh Market Cultivars

Fresh Market Cultivars evaluated at Tifton, GA

Click on the cultivar name for more details and pictures of the berries. Cultivars listed in **BOLD** are the ones we have found most useful in south Georgia.

Cultivar	Flower Type	Berry Color	Harvest Period	Berry Size	Productivity ^a	% Dry Scar
Alachua	Self-fertile	Purple	Midseason	Medium	100%	50%
Cowart	Self-fertile	Purple	Midseason	Medium	40%	30%
Darlene	Female	Bronze	Midseason	Very Large	40%	20%
Delicious	Self-fertile	Purple	Early-Mid	Large	130%	?
Dixieland	Female	Bronze	Late	Large	90%	10%

Choosing a Cultivar

Juice Cultivars

Fresh Market Cultivars

Alachua

Cowart

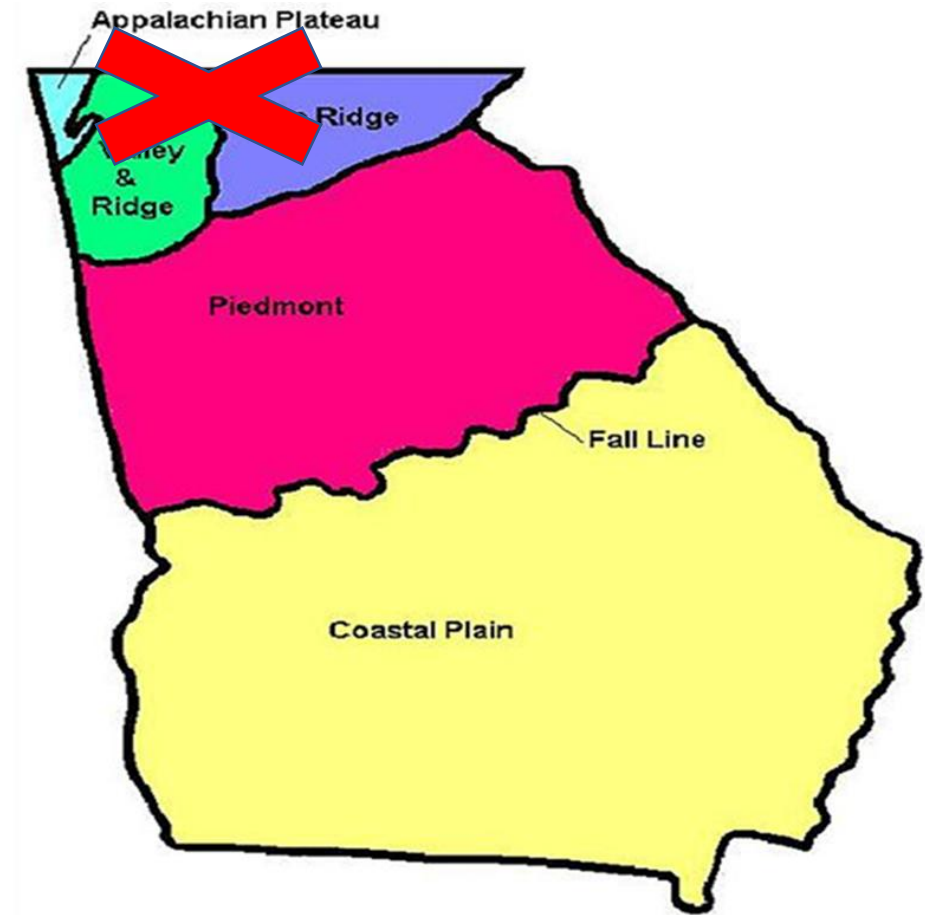
Darlene

Delicious

Dixieland

Early Fry

Considering vineyard location when choosing cultivars



A word about fungal diseases

- **Bronze-skinned cultivars have proven to be more disease sensitive than purple-skinned**
- So what?:
 - Bronze cultivars will rot more than purple cultivars under same pesticide management and climate
 - Organic will likely be easier for purple skinned cultivars
 - Fewer losses in purple skinned cultivars
 - Cosmetic defects (for fresh market) will likely be lesser in purple skinned relative to bronze skinned

In general, dark grapes are more rot resistant than bronze ones



Bill Cline, 2013

NC STATE UNIVERSITY

Materials needed for establishment

Cain Hickey



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Inspiration for
this information...



Case study

- Grower:
- “I wish I would have known how important it was to have (insert materials) on hand before or immediately after I planted my first vine...”
- Can set back a vineyard in getting to production...



Overview

- Pre-planting
- Planting
- Post-planting



Land clearing, grading, and preparation

- Requires various tractor implements
- Heavy equipment may be needed
 - Excavation company?
- Remove:
 - Trees and shrubs
 - Rocks
 - Roots
- Perennial weeds



Soil amendments and adjustments

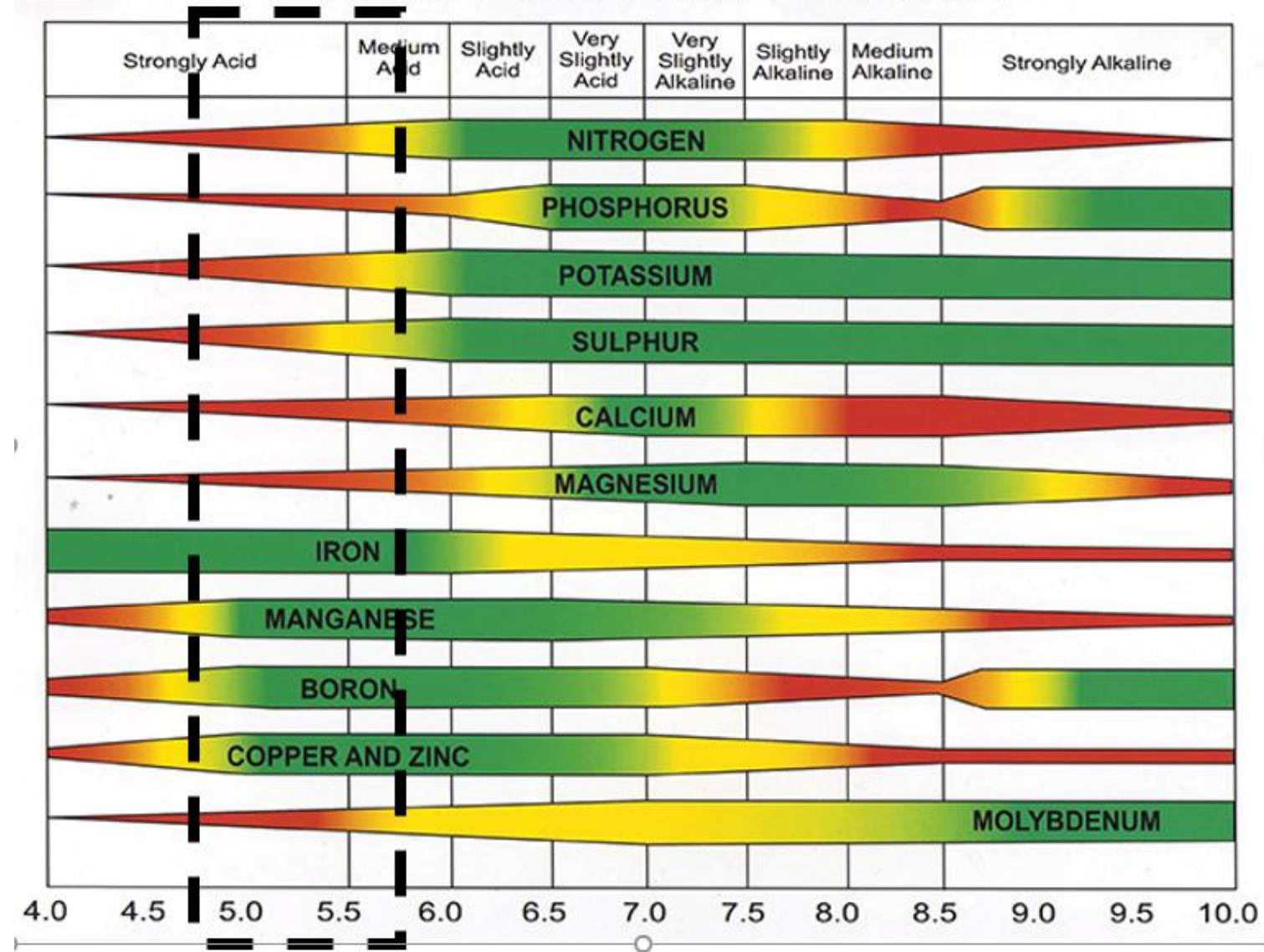
- pH – MUST AMEND **BEFORE PLANTING**
 - Bunch grapes = 6.5
 - Muscadines = 6.0
- Nutrients
 - Focus on immobile relative to mobile in the pre-plant stage
- Organic matter
 - Generally adequate in most situations
 - Especially in historical pastureland

Nutrient	Symbol	Target Soil Values (ppm)
Potassium	K	75-100
Phosphorous	P	20-50
Calcium	Ca	500-2,000
Magnesium	Mg	100-250
Boron	B	0.3-20
Iron	Fe	20
Manganese	Mn	20
Copper	Cu	0.5
Zinc	Zn	2
Aluminum	Al	<100
Organic Matter		3-5%

Nutrient mobility -

Nutrient	Macro/micro	Uptake form	Mobility in Plant	Mobility in Soil
Carbon	Macro	CO_2 , H_2CO_3		
Hydrogen	Macro	H^+ , OH^- , H_2O		
Oxygen	Macro	O_2		
Nitrogen	Macro	NO_3^- , NH_4^+	Mobile	Mobile as NO_3^- , immobile as NH_4^+
Phosphorus	Macro	HPO_4^{2-} , H_2PO_4^-	Somewhat mobile	Immobile
Potassium	Macro	K^+	Very mobile	Somewhat mobile
Calcium	Macro	Ca^{2+}	Immobile	Somewhat mobile
Magnesium	Macro	Mg^{2+}	Somewhat mobile	Immobile
Sulfur	Macro	SO_4^{2-}	Mobile	Mobile
Boron	Micro	H_3BO_3 , BO_3^{3-}	Immobile	Very mobile
Copper	Micro	Cu^{2+}	Immobile	Immobile
Iron	Micro	Fe^{2+} , Fe^{3+}	Immobile	Immobile
Manganese	Micro	Mn^{2+}	Immobile	Mobile
Zinc	Micro	Zn^{2+}	Immobile	Immobile
Molybdenum	Micro	MoO_4^{2-}	Immobile	Somewhat mobile
Chlorine	Micro	Cl^-	Mobile	Mobile
Cobalt	Micro	Co^{2+}	Immobile	Somewhat mobile
Nickel	Micro	Ni^{2+}	Mobile	Somewhat mobile

Strongly Acid	Medium Acid	Slightly Acid	Very Slightly Acid	Very Slightly Alkaline	Slightly Alkaline	Medium Alkaline	Strongly Alkaline
NITROGEN							
PHOSPHORUS							
POTASSIUM							
SULPHUR							
CALCIUM							
MAGNESIUM							
IRON							
MANGANESE							
BORON							
COPPER AND ZINC							
MOLYBDENUM							



Surveying and measuring equipment

Tremain Hatch

- Hire a professional surveyor or do it yourself
- Marking Lines
 - set one true, straight line; go parallel or perpendicular in reference
- Need a smooth surface
 - can be grass or clean cultivated
- A good eye helps!!



Once land has been cleared and graded....

Skid steer

Auger

If soil high clay content and highly compacted...

Tractor

Ripper Shanks

Rear / back blade



Pre-plant



Fritz Westover

Surveying and measuring equipment

Tremain Hatch

- Hire a professional surveyor or do it yourself
- Marking Lines
 - set one true, straight line; go parallel or perpendicular in reference
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Once land has been cleared and graded....

Skid steer

Auger

If high clay content and highly compacted...

Tractor

Ripper Shanks

Rear / back blade





Distance wheel



Surveying flags



Trellis posts



Herbicide





Irrigation manifolds and headers



Planting



Auger, skid steer, tractor



Vines

Cultivar?

Quantity?

Rootstock?
Own-rooted?

Clone?

Dormant rooted?
Live / green potted?



Various planting tools

Trowels

Post hole digger

Spade shovel

Kneel pads

Buckets with water

(to soak and transport vines)

Extra soil / compost / pomace / etc.



Post-planting



Trellis posts

Sometimes installed after planting
-a must if mechanically planted



Vine shelters



Irrigation tubing



**Earth / ground anchors
(3 to 4 feet long)**



<https://www.orchardvalleysupply.com/collections/trellis-anchors/products/earth-anchors?variant=15121898694>



Staples

(for wood posts)



Spinning Jenny

(to dispense wire)



High tensile smooth steel wire

Wound under tension

12.5 – 14.0 gauge

Sold in 500, 1000, and 4000 ft. rolls



Wire fasteners



Training stakes



Vine training tools



Herbicide



Trellis hardware



Budgeting labor and time

- **Year 1 labor inputs:**

- Planting, staking, tying, training, pruning
- My estimation (after planting):
 - One full time (40 hours / week) person could execute necessary year 1 tasks on roughly four to five acres.

- **Year 1 goal:**

- Establish trunks



Budgeting labor and time

- **Year 2 labor inputs:**
 - Tying, training, pruning
 - My estimation (after planting):
 - One full time (40 hours / week) person could execute necessary year 2 tasks on roughly five to seven acres.
- **Year 2 goal:**
 - Establish cordons



Budgeting labor and time

- **Year 3 and beyond labor inputs:**

- Training, pruning, spraying pesticides, harvesting
- My estimation (after planting):
 - One full time (40 hours / week) person could execute necessary year 1 tasks on roughly 10 to 20 acres.

- **Year 3 and beyond goals:**

- Continue to establish cordons, spray pesticides, harvest, prune



June 2018



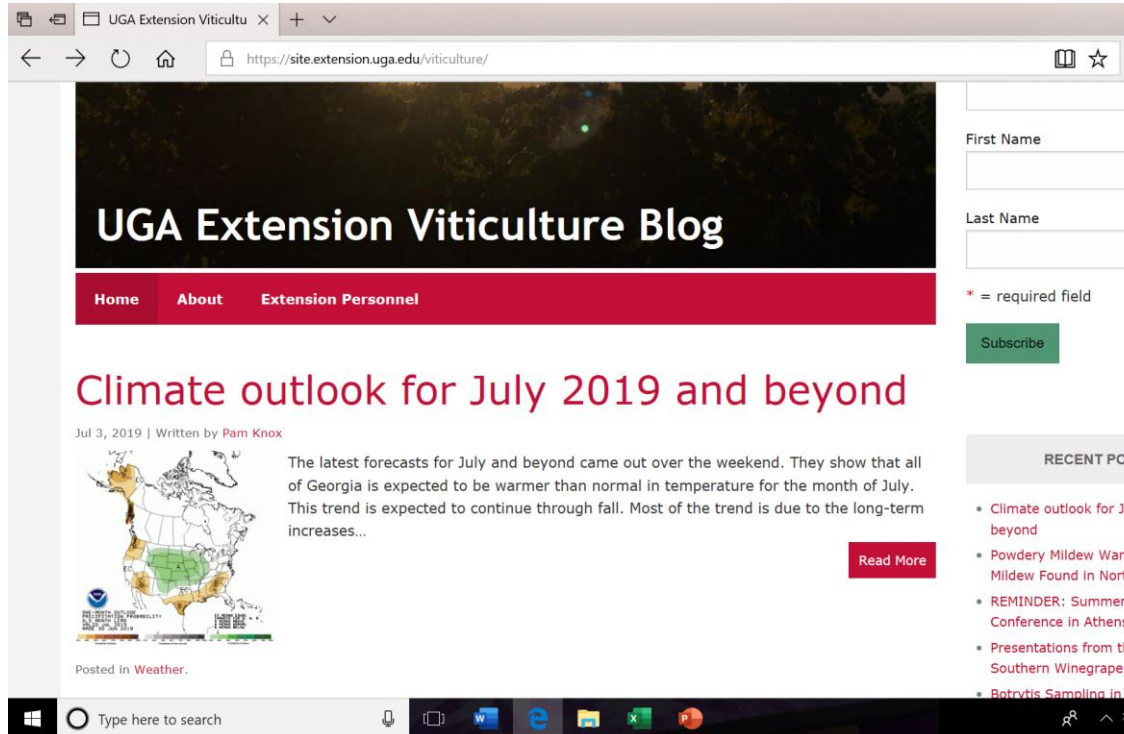
June 2019



October 2018



<https://site.extension.uga.edu/viticulture/>

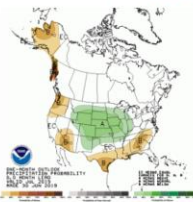


UGA Extension Viticulture Blog

Home About Extension Personnel

Climate outlook for July 2019 and beyond

Jul 3, 2019 | Written by Pam Knox



The latest forecasts for July and beyond came out over the weekend. They show that all of Georgia is expected to be warmer than normal in temperature for the month of July. This trend is expected to continue through fall. Most of the trend is due to the long-term increases...

[Read More](#)

Posted in [Weather](#).

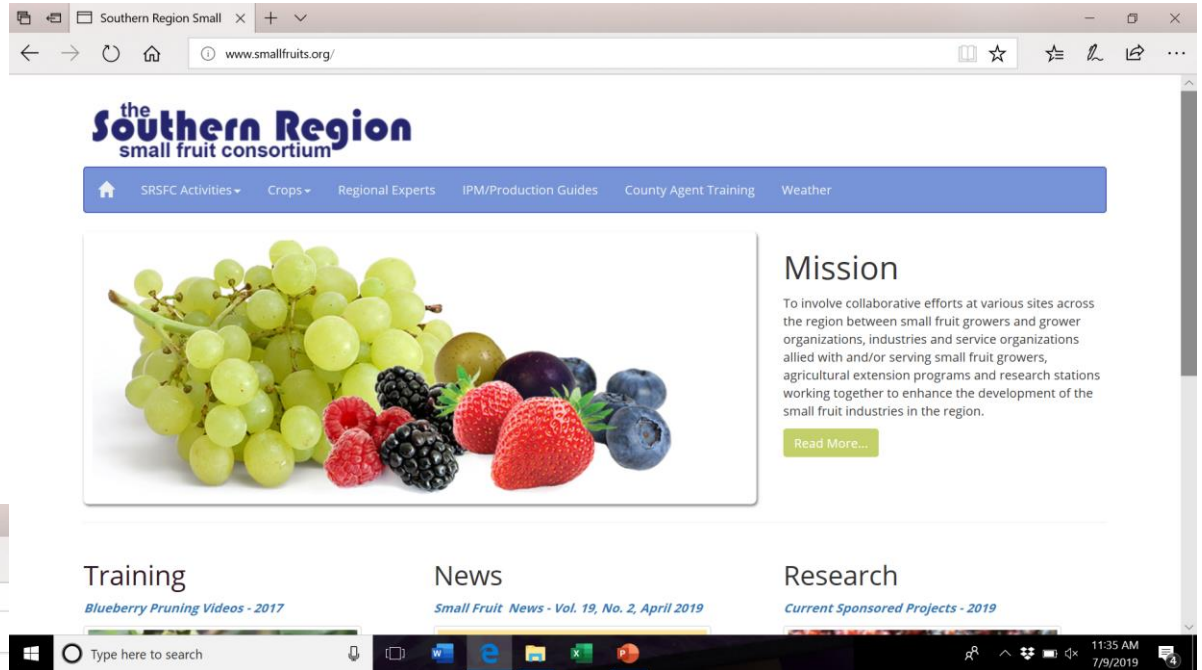
First Name

Last Name

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RECENT POSTS

- Climate outlook for July 2019 and beyond
- Powdery Mildew Warning — Powdery Mildew Found in North Georgia 6/28
- REMINDER: Summer Muscadine Conference in Athens on July 9th
- Presentations from the 2019 Southern Winegrape Symposium
- Botrytis Sampling in Wine Grapes for



the Southern Region
small fruit consortium

SRSFC Activities Crops Regional Experts IPM/Production Guides County Agent Training Weather



Mission

To involve collaborative efforts at various sites across the region between small fruit growers and grower organizations, industries and service organizations allied with and/or serving small fruit growers, agricultural extension programs and research stations working together to enhance the development of the small fruit industries in the region.

[Read More...](#)

Training News Research

[Blueberry Pruning Videos - 2017](#)

[Small Fruit News - Vol. 19, No. 2, April 2019](#)

[Current Sponsored Projects - 2019](#)

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