



VIRTUAL MUSCADINE CONFERENCE 2021

Muscadine Production 101

Pesticide Credits:

- Need to be in the webinar for the whole time
 - Indicate **NOW** if you want credits in chat
- Have your full name and license # at the end

Muscadine Production 101



Mark Hoffmann, NC State University

Costs and Site Selection

Cultivars

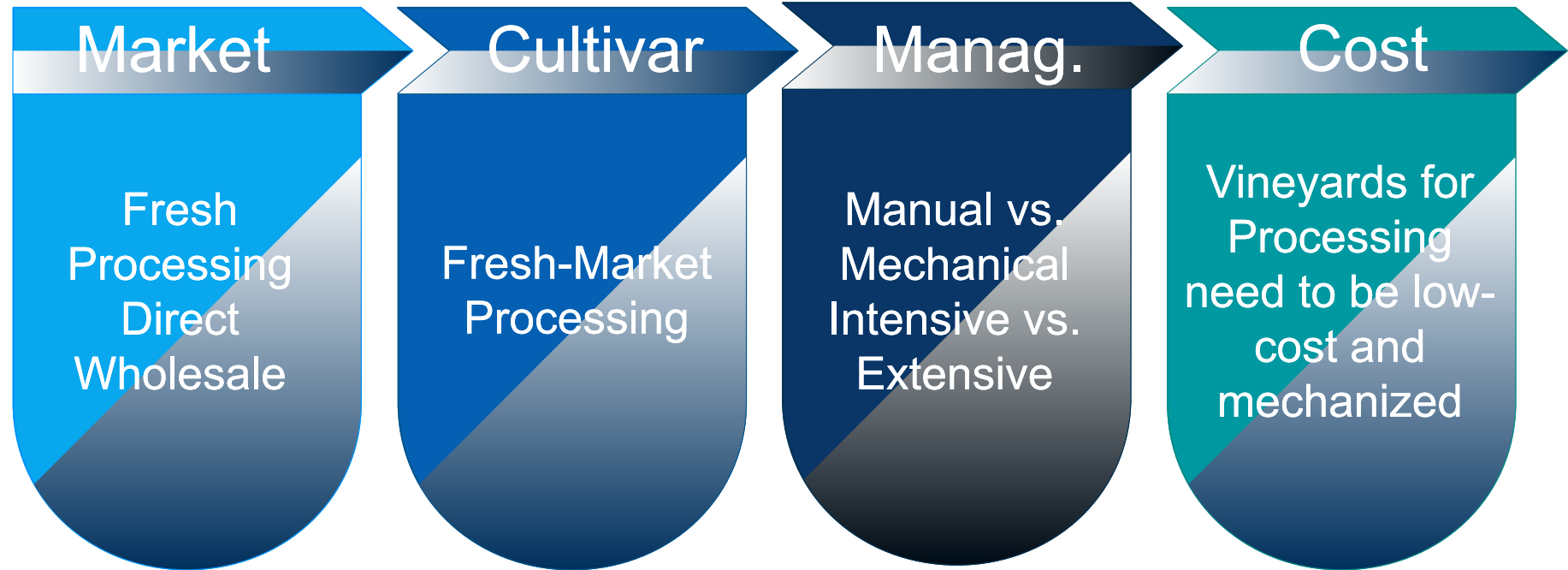
Trellis and Training

Pruning

Management

Costs and Site Selection

How much costs a vineyard?



Year 1: Site Selection and Field Prep

Year 2: Planting and Trellis

Year 3: Establishment

Year 4: First Harvest

Market	Management	Upfront Investment	Labor Demand	Returns /acre	Time Scale to profitability
Direct-to Consumer	Intensive + small (1-2 acres) + Food Safety	\$	++	moderate	5-8 years
Whole Sale	Intensive + large + Food Safety	\$\$\$	+++	High	7-10 years
Processing	Low-Cost, large scale, mechanized	\$\$	+	Low	5-10 years
Wine Sales	Low-Cost, mechanized, tasting room; Events;	\$\$\$\$	+++	N/A	7-10 years
Wine Making	Low-Cost, mechanized; Tasting Room, Events; Winery	\$\$\$\$\$\$	++++	N/A	10-12 years

Year	Activity	Material	Material \$/acre	Labor ¹ \$/acre	Total \$/acre
0	Land clearing and leveling	Service ²	\$300–\$3,000		
	Soil cultivation	Service ²	\$50–\$300		
	Irrigation installation	Service ²	\$3,500–\$6,500		
	Grape vines (ordering)	218 vines/acre \$10 per vine	\$2,180 -		\$2,180
	Application of lime ³	-	-	-	-
	Weed control	Strip spray with Roundup	\$10	\$28	\$38
	Establishment of trellis system ⁴	218 4"x8" posts \$8 per piece 84 6"x8" posts \$12 per piece 42 4"x4" timbers \$12 per piece 3 rolls of 9" wire \$50 per roll Anchors, Fasteners etc.	\$1,744 \$1,008 \$504 \$150 \$200	\$600	\$4,406
1–2	Grape vine planting ⁵		-	\$1,080	\$1,080
	Pest control	Pesticide applications	\$20–\$50	\$72	\$92–\$122
	Training	Training on trellis (supplies include grow tubes, 6' bamboo stakes, orchard tape)	\$436	\$1,044	\$1,480
	Pruning		-	\$120	\$120
TOTAL COSTS					\$13,246–\$19,106

Table 4. Projected estimate of costs per acre for the maintenance of a muscadine vineyard per year. Equipment costs are not included.

Year	Activity	Material	Material \$/ acre	Labor \$/ acre	Total \$/acre
3 and following	Pre-harvest cultural management ¹ (fertilization, hedging, training, repairs etc.)	Fertilizer \$20/50lb	\$160	\$240	\$400
	Pest and weed management ² (spray applications, mowing, debris removal etc.)	Pesticides variable	\$200–\$500	\$480	\$680– \$980
	Harvest	-	-		
	Hand harvest ³			\$1,800	\$1,800
	Machine harvest ⁴			\$270–\$720	\$270–\$720
	Post-harvest cultural management ⁵ (debris removal, pruning)	-	-	\$600	\$600
TOTAL COSTS	Hand-harvest				\$3,480–\$3,780
	Machine harvest				\$1,950–\$2,400

¹20 hours of labor/acre are estimated for pre-harvest cultural management.

²40 hours of labor/acre are estimated for pest and weed management.

³60 hours of labor/acre are estimated for one pass of hand harvesting grapes (three harvest events are estimated).

⁴Rates to rent mechanical harvester can vary.

⁵50 hours of labor/acre are estimated for pruning and other post-harvest cultural management.

Rule of thumb

Investment into one acre of muscadine vineyard from establishment (Year 1) to first harvest (Year 4)

\$20,000 - \$30,000 / acre

Capital Expenditures

Pre-Pruning Equipment;

Mower;

Hedging;

Tractor with Cabin;

Airblast Sprayer;

Post Driver;

Mechanical Pruners

Harvest Equipment (Bins, contract with mech. Harvester)

Expenses

Pruning Labor

Harvest Labor

Labor for weed and canopy management;

Labor for disease/pest management;

Repairs on Machinery and Vineyard

Fuel/Oil/Taxes/Insurance etc.

Long-Term: Revenue > Total Cost

Make a business plan before you start

Set yourself goals

Be realistic!!!!!!!

Farming needs to be cost-effective;

*If you lose money, more and more frustration will creep in
Risking the well-being of yourself, your family and loved-ones.*

A blue speech bubble graphic with a white border and a dark blue gradient on the right side. The text "Site Selection" is centered inside the bubble in white.

Site Selection

Questions?

1. Is the site suitable to your market needs?
2. Is the pH correct?
3. Water Drainage?
4. Air Drainage?

1. Market Needs

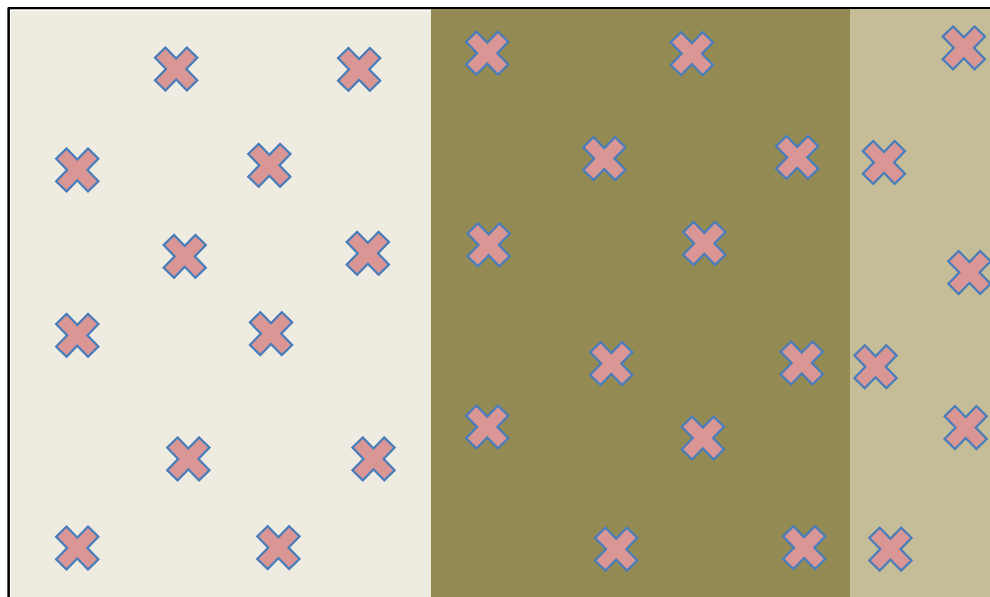
1. U-Pick: Easy access for cars; Parking Space; Space of Children/Activity?; Close to a road/busy neighborhood;
2. Processing: Easy access for heavy machinery; Turnaround space for heavy machinery; Even growth; Sturdy trellis and post;

2. Soil pH: 6.0-6.5

Soil sampling :

- **0-7 inches**
- **7-14 inches**

Summer before
planting



Combined Samples 1 and 2
(0-7;7-14)

Combined Samples 3 and 4
(0-7;7-14)

Combined
Samples 5 and 6
(0-7;7-14)

Adjust pH based on Soil Samples

Send soil samples to

www.ncagr.gov/agronomi/sthome.htm

Optimal pH: 6.0-6.5

Optimal P in soil 30 ppm of P

Adjust pH based on Soil Samples

Lime (not Gypsum)

**Incorporate in the summer BEFORE posts
and planting**

3. Water Drainage

Photo Courtesy:
Connie Fisk



Standing Water is a red flag

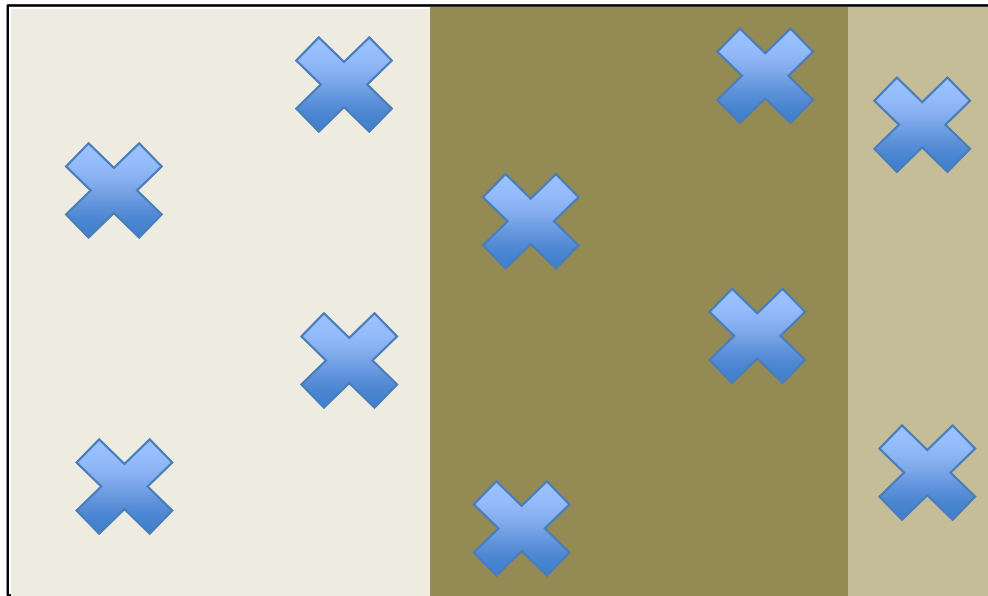
- Standing water or bad/no drainage will cause low growth and disease problems down the line. Don't plant!

Evaluate Field with Auger

Evaluate field

- For long standing water after heavy rain
- For hard soil layers in the upper **30-40 inches**

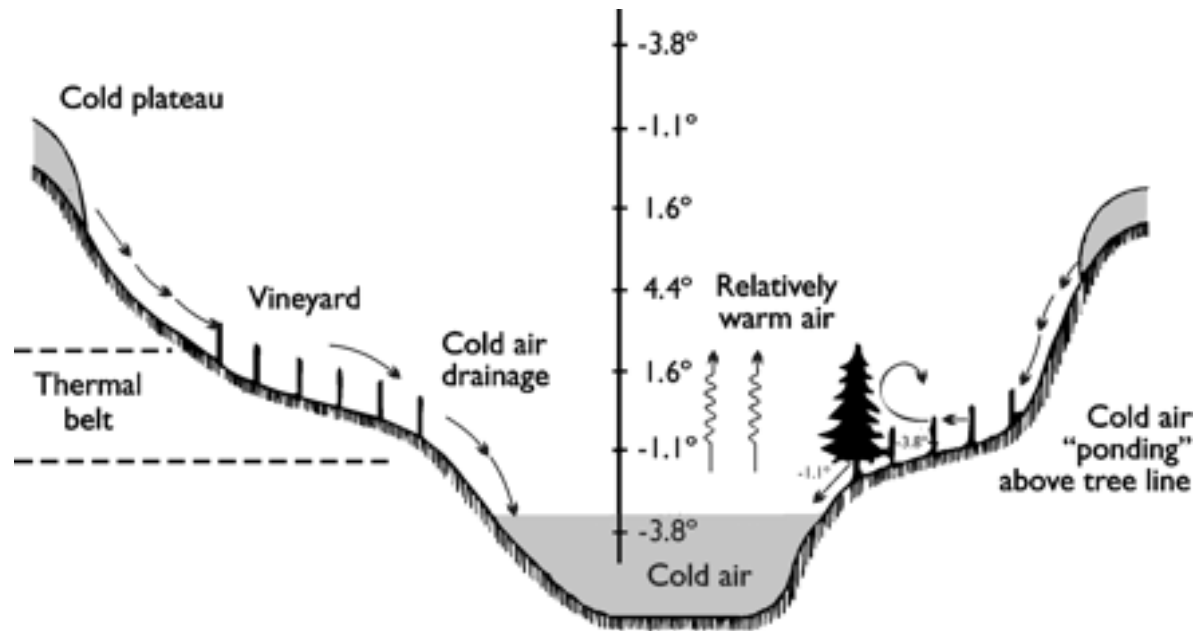
Summer before planting



4. Air Drainage

Evaluate field

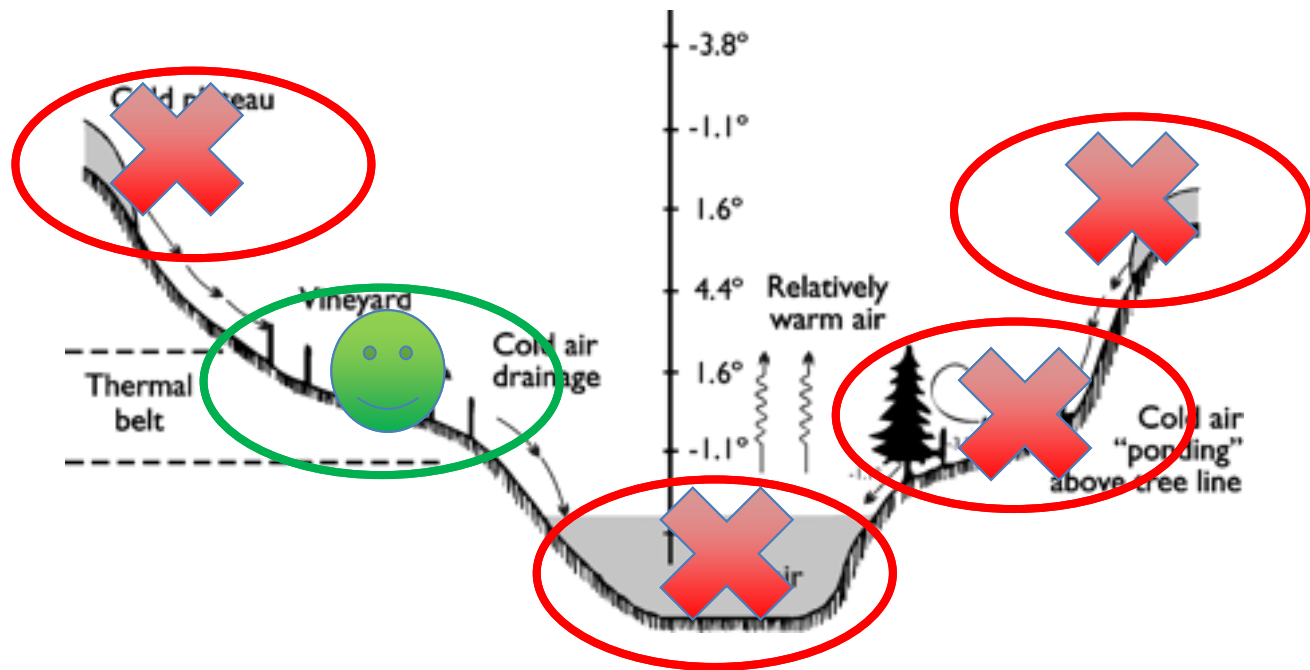
- Vineyards need two things:
- **Sunlight**
- **Air Drainage**



If planted in the wrong spot

Increased risk of:

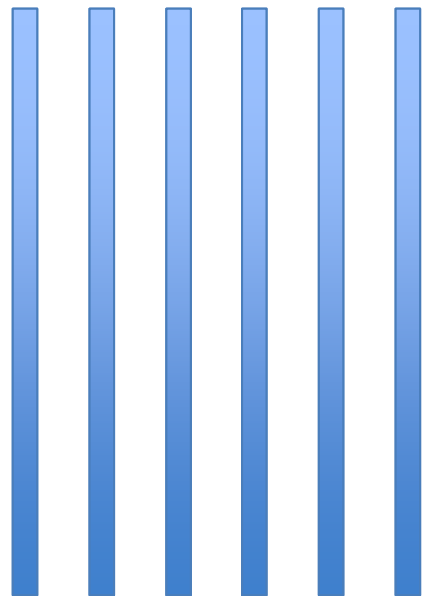
- Dead plants
- Split Trunks
- Frost Damage



One more thing: Turn Around

Turn Around Space

30 -40 ft



Turn Around Space



Cultivars

- Muscadine cultivars are either female or self-fertile (perfect flower)
- Male muscadines are not used in commercial production, and are often not/less fruitful
- All female cultivars need a self-fertile pollinator



Figure 2. Close-ups of male, self-fertile ("perfect"), and female muscadine flower clusters (photos by Patrick Conner).

4 | Muscadine Grape Production Guide for the Southeast

<https://content.ces.ncsu.edu/muscadine-grape-production-guide>

Don't sell wine/juice cultivars for fresh consumption

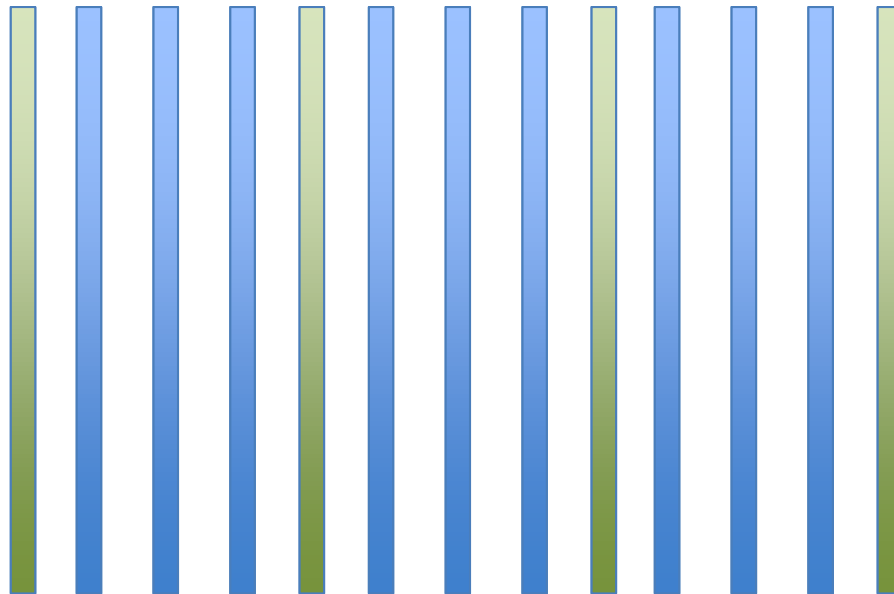
- **Wine/juice Cultivars:** High yields, high sugar, small berry size, wet picking scar, poor eating quality!
- **Fresh-Market:** large, firm, dry picking scar, high eating quality! Can also be used for wine/juice.

Photo
courtesy:
Dr. Patrick
Conner,
University
of Georgia



Female vs. Self-Fertile

Rule of thumb: 1:3 ratio
(self-fertile : female)



Dark Fresh-Market

Season	Cultivar	Flower type
Early	Lane	Self-fertile
Mid	Supreme	Female
Mid	Ison	Self-fertile
Mid	Black Fry	Female
Mid	Paulk	Self-fertile
Late	Nesbitt	Self-fertile

Bronze Fresh-Market

Season	Cultivar	Flower type
Early	Hall	Self-fertile
Early	Triumph	Self-fertile
Mid	Tara	Self-Fertile
Mid	Fry	Female
Late	Late Fry	Self-fertile

Processing Cultivars

Color	Cultivar	Flower type
Dark	Noble	Self-fertile
Bronze	Carlos	Self-fertile
Bronze	Doreen	Self-fertile
Bronze	Magnolia	Self-fertile



Photo courtesy:
Dr. Patrick Conner, University of Georgia

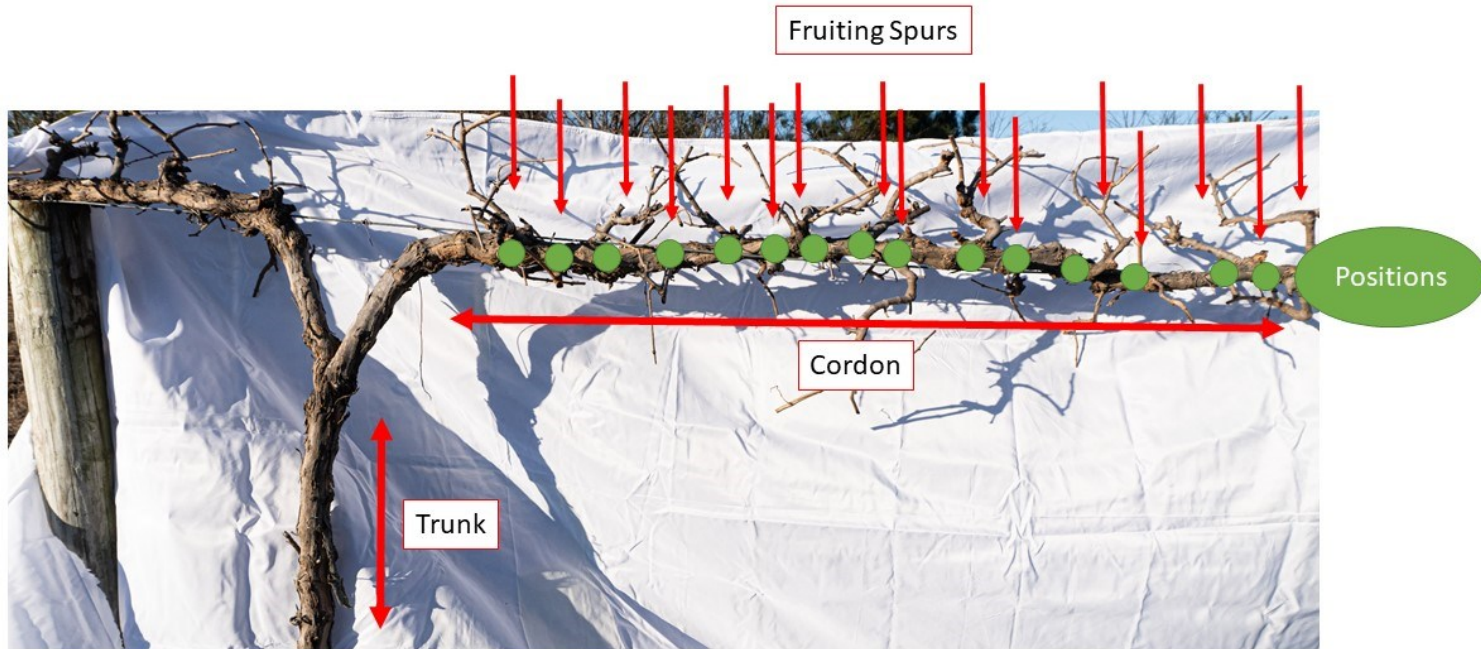
Planting Rules:

- Planting always in Spring of Year 2 after the last frost
- Alternative can be planted in Fall, but not recommended
- Young plants need frequent water and fertilizer
- Amount of water and fertilizer depends on soil type
- Clay/Loam soils: Less water/fertilizer than Sandy soils
- Min: 10-11 ft row spacing

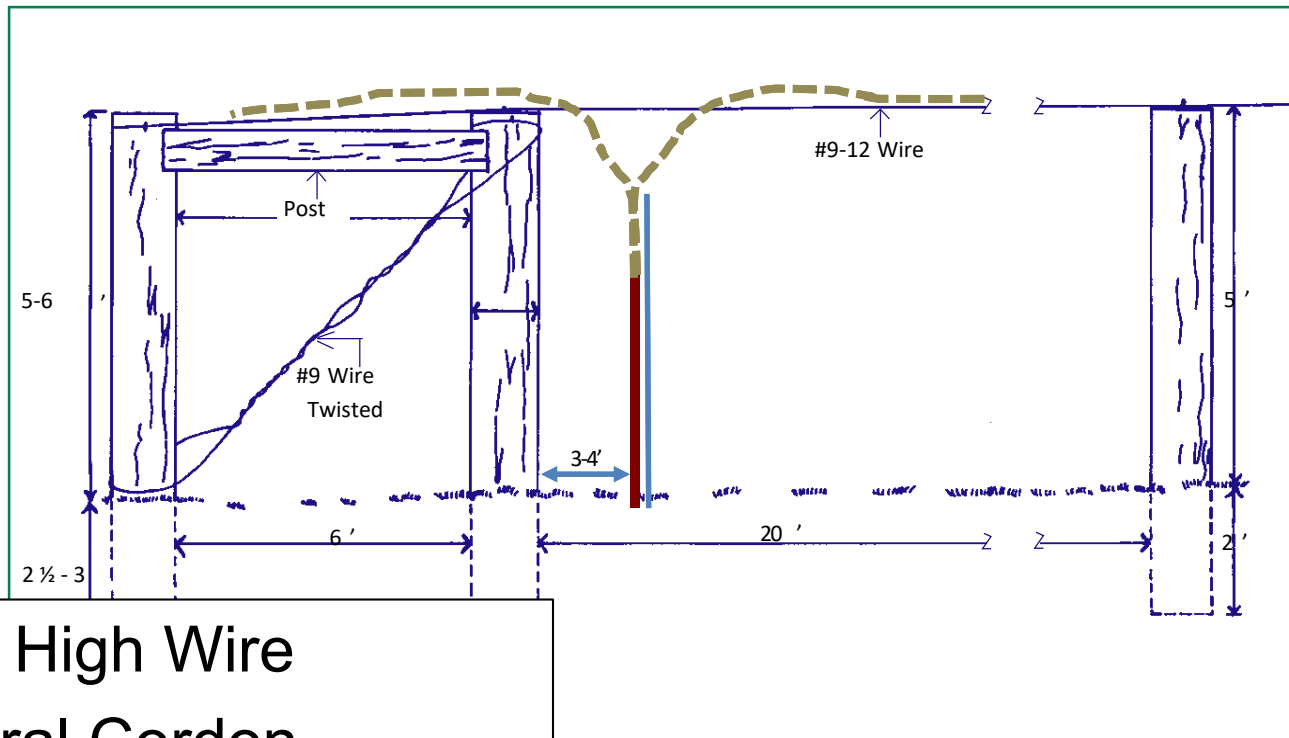
Trellis and Training



Photos by Emma Volk and Mark Hoffmann



- Trunk: Structure from root system to wire
- Cordon: Arm along the wire
- Spurs: Structures established on positions along the cordon, bearing one-year old wood



- Single High Wire
- Bi-lateral Cordon
- Spur Pruning System



Photos by Emma Volk and Mark Hoffmann

Management

- Labor and cost Intensive: Pruning AND Harvest
- **If wine/juice production: Use mechanical harvest and mechanical pruning (in rotation with manual pruning)**
- Weed Control (chemical and mowing)
- Cultural: Fertilizing, Hedging and Skirting
- Disease Control

Winter (Nov-Feb)

- Pruning and Sanitation
- Any trellis work (replacement, strain, etc.)
- Any post replacement
- Any repairs on drip system (if necessary)
- Dormant sprays

Spring (Mar-May)

- Early disease control
- Planting/Replanting
- Fertilization
- Weed control: Herbicides under vine
- Weed control: Frequent mowing
- Put vine-shelter ('grow tubes') back on the new plants

Summer (Jun-Jul)

- Disease control
- Scout for Root Borer
- Pest control if necessary
- Last Fertilization
- Weed control: Herbicides under vine and Mowing
- Hedging before Harvest
- Skirting (knee high) when growing to the ground

Summer/Fall (Aug-Sep)

- Disease control
- Scout for Root Borer
- Pest control if necessary
- **HARVEST: watch REI and PEIs**
- Weed control

Fall (Oct-Nov)

- Disease control
- Make sure that all fruit are off the vine → Disease!
- **Take off vine-shelter (grow-tubes) after harvest**

<https://grapes.ces.ncsu.edu/>

<https://smallfruits.org/>

[https://content.ces.ncsu.edu/muscadine-grape-
production-guide](https://content.ces.ncsu.edu/muscadine-grape-production-guide)



Thank You

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