

North Carolina
Muscadine
GRAPE
Association



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

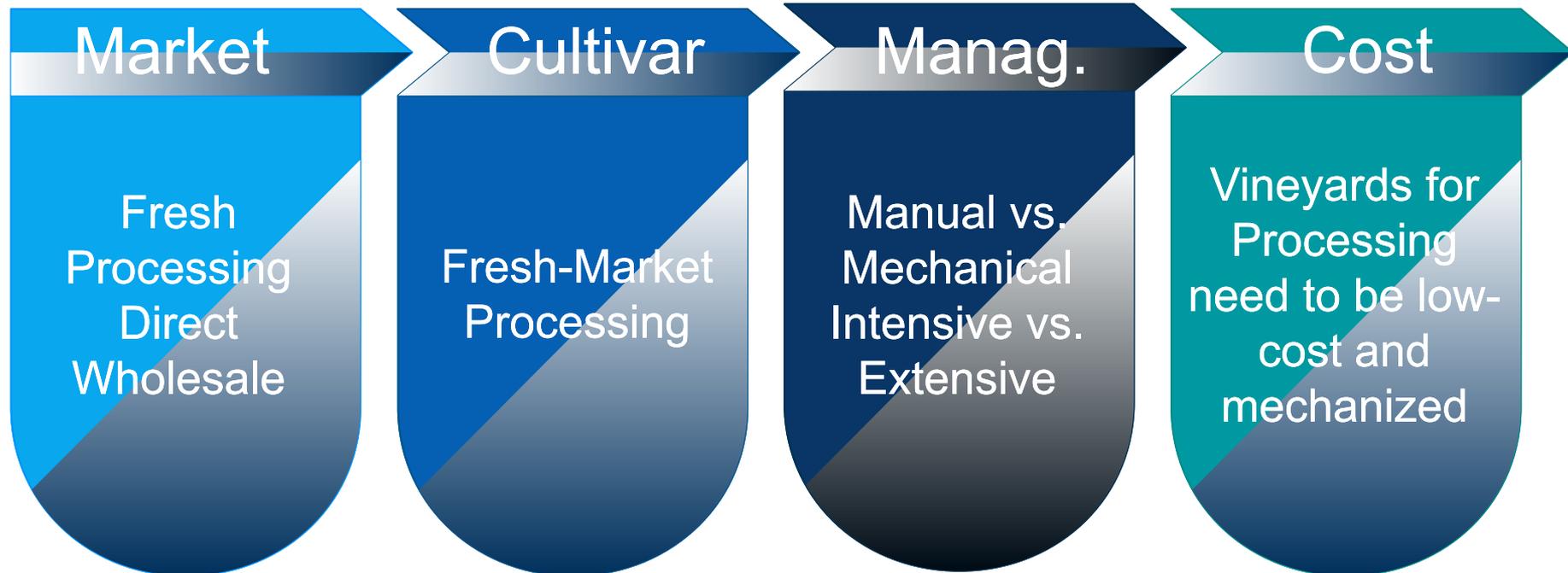
Trellis and Training

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 <i>\$10 per vine</i>	\$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 <i>\$8 per piece</i> 84 6"x8" posts <i>\$12 per piece</i> 42 4"x4" timbers <i>\$12 per piece</i> 3 rolls of 9" wire <i>\$50 per roll</i> 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 <i>variable</i>	\$200–\$500	\$480	\$680– \$980
	Harvest <i>Hand harvest</i> ³ <i>Machine harvest</i> ⁴	-	-	\$1,800 \$270–\$720	\$1,800 \$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.*



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

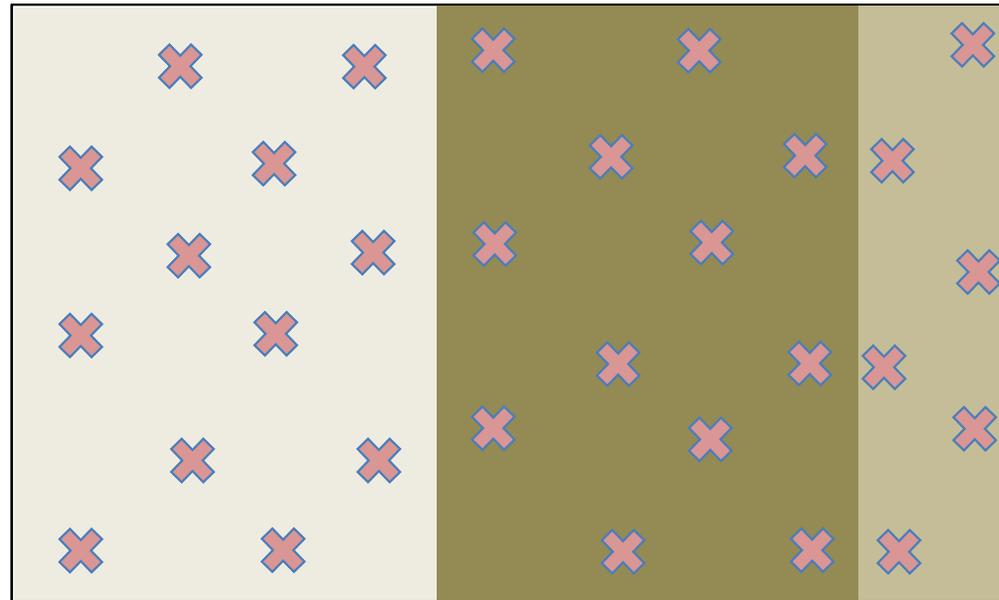
1. U-Pick: Easy access for cars; Parking Space; Space of Children/Activity?; Close to a road/busy neighborhood;
2. Processing: Easy access for heavy machinery; Turnaround space for heavy machinery; Even growth; Sturdy trellis and post;

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

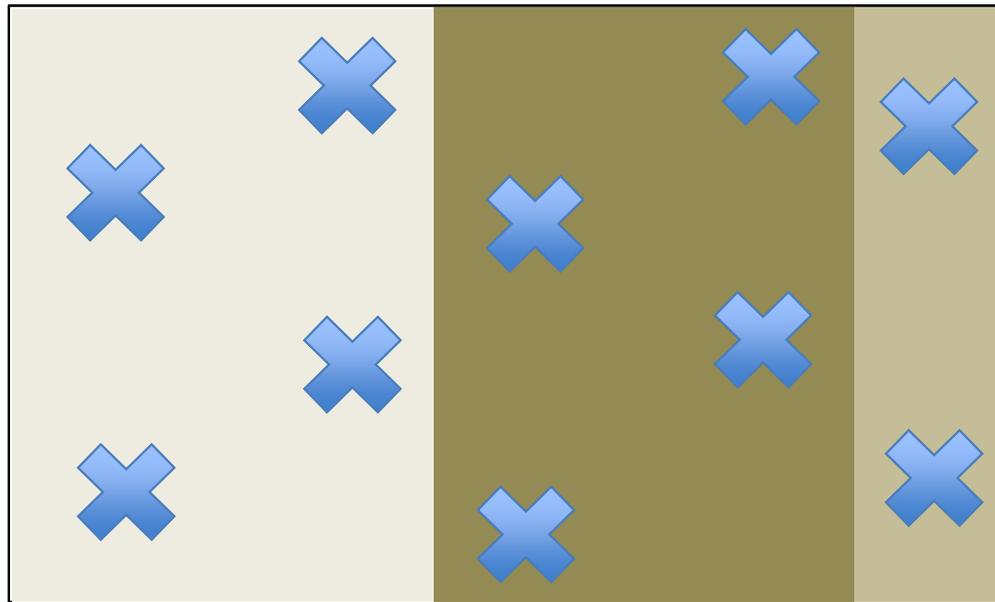
- Standing water or bad/no drainage will cause low growth and disease problems down the line. Don't plant!

Evaluate Field with Auger

Evaluate field

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

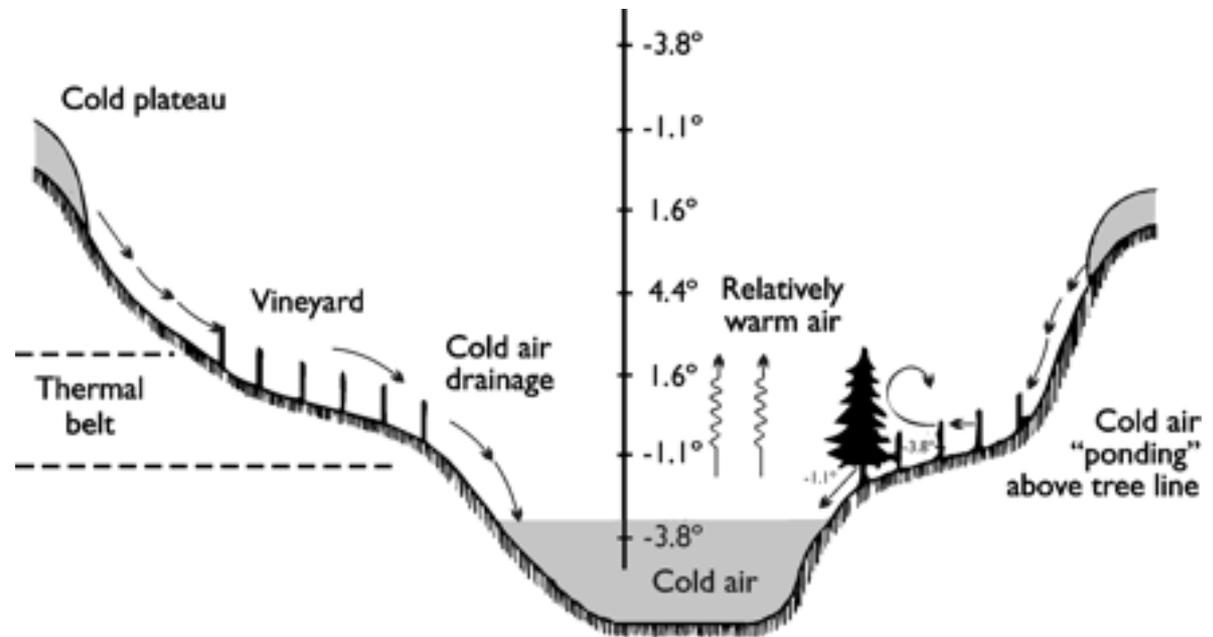
Summer before planting



4. Air Drainage

Evaluate field

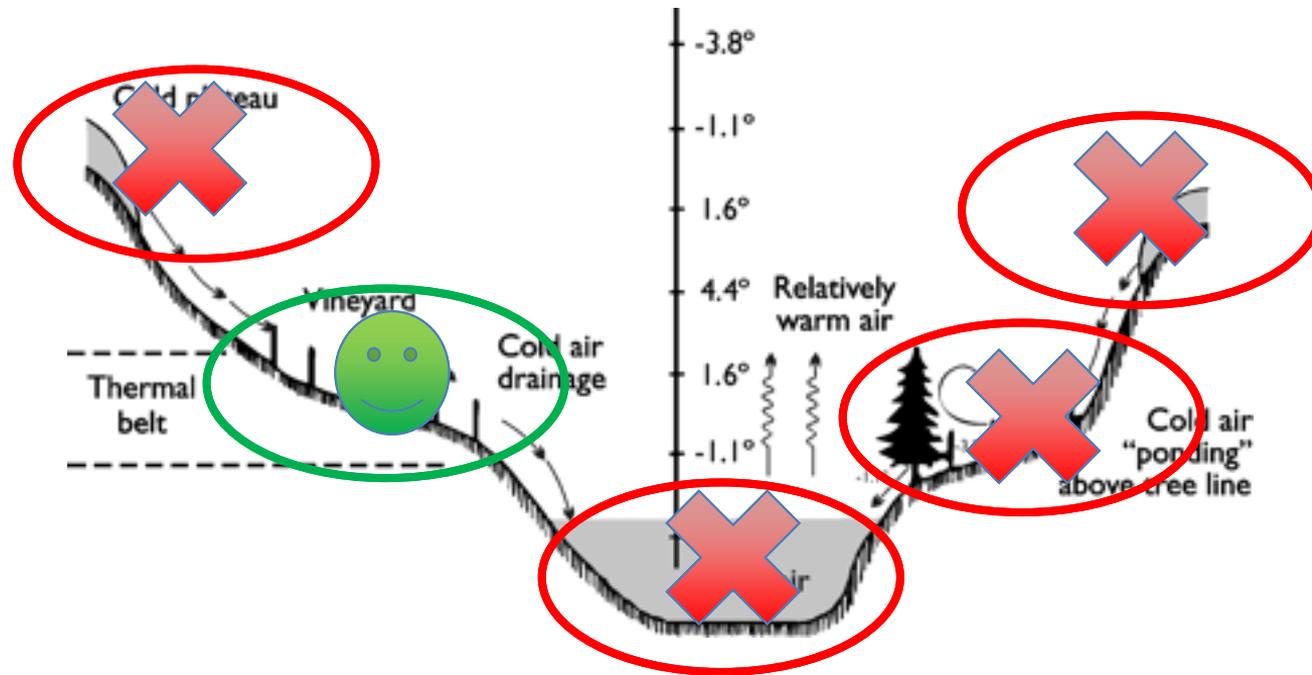
- Vineyards need two things:
- **Sunlight**
- **Air Drainage**



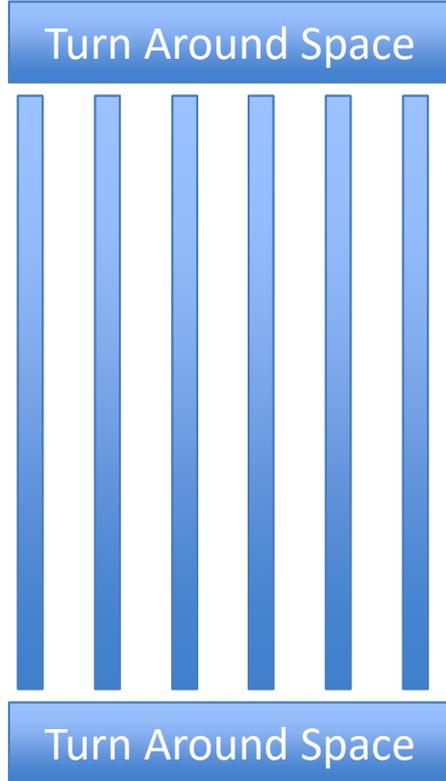
If planted in the wrong spot

Increased risk of:

- Dead plants
- Split Trunks
- Frost Damage



One more thing: Turn Around



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

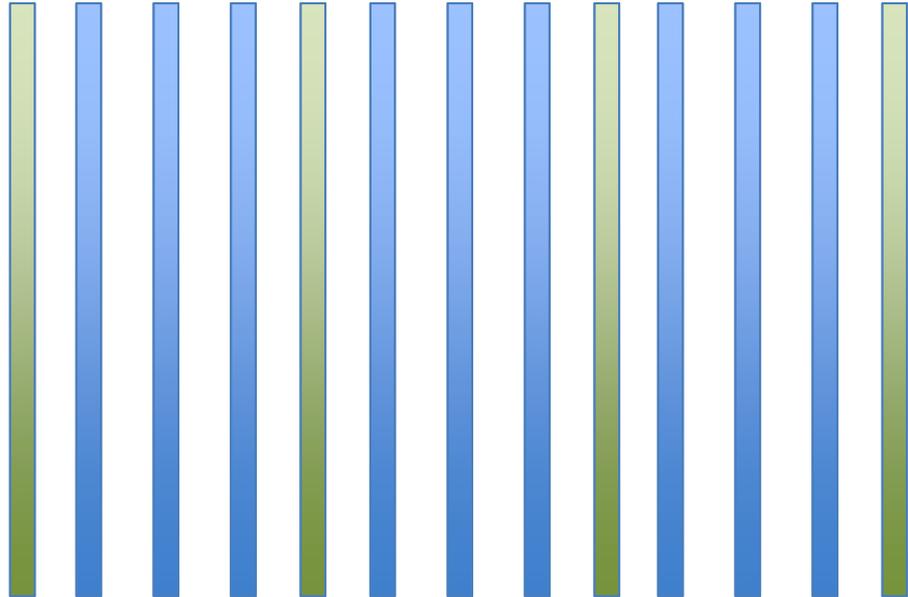
- **Wine/juice Cultivars:** High yields, high sugar, small berry size, wet picking scar, poor eating quality!
- **Fresh-Market:** large, firm, dry picking scar, high eating quality! Can also be used for wine/juice.

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

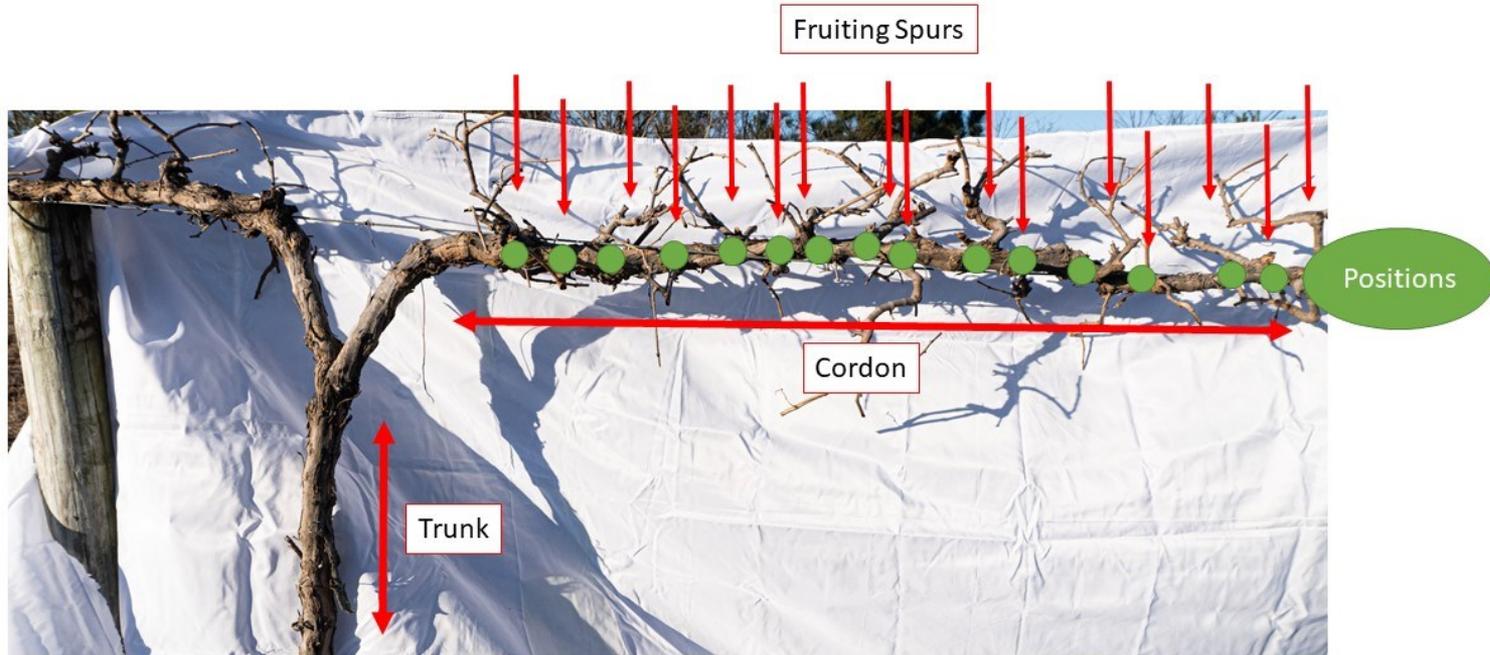
Planting Rules:

- 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

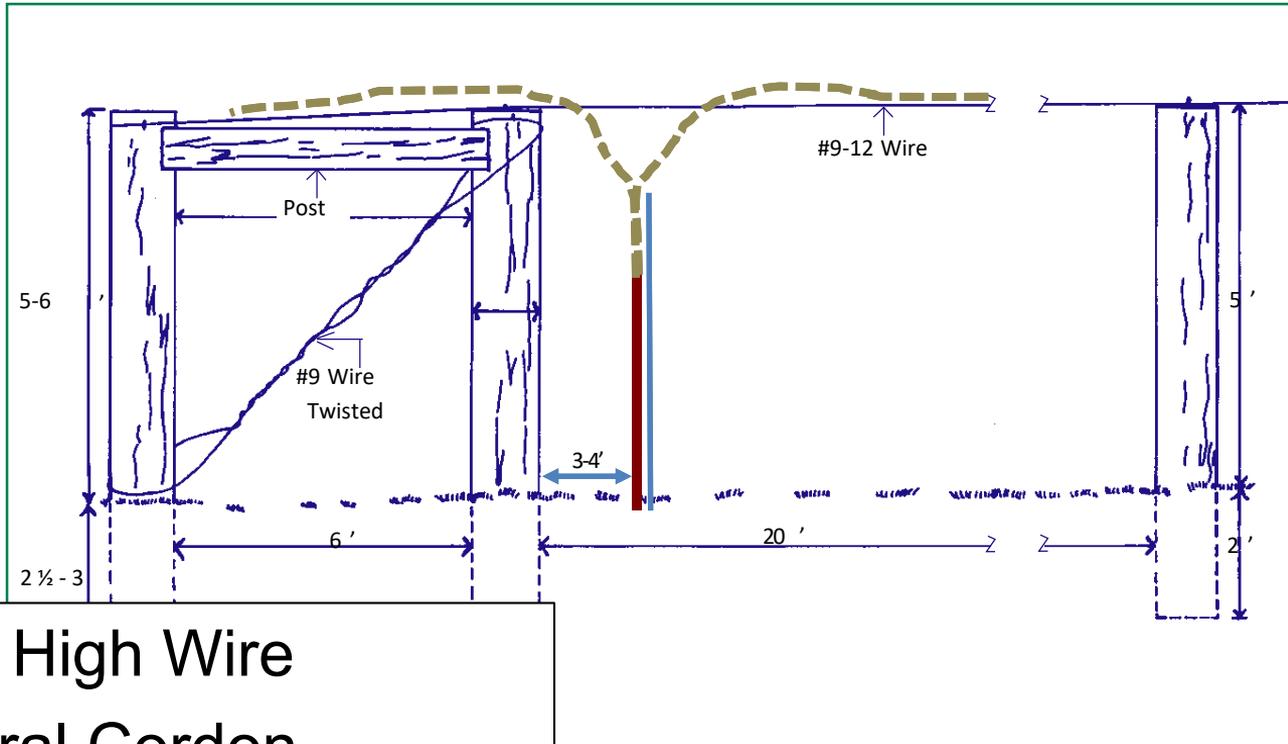
Trellis and Training



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>



Thank You

mark.hoffmann@ncsu.edu