Muscadine Summer Chores 101

Mark Hoffmann, NC State University
3 Things to Worry About

• Do you want to expand next year?

• Young vines in their first year?

• Mature vines?
Site Selection and Soil Testing

Cultivars

Vine training

Fertilization

Canopy Management

new planting in 2022

young first year vines

mature vineyard

mature vineyard
How much costs a vineyard?
Markets and Site Selection

**Market**
- Fresh Processing Direct Wholesale

**Cultivar**
- Fresh-Market Processing

**Management**
- Manual vs. Mechanical
  - Intensive vs. Extensive

**Cost**
- Vineyards for Processing need to be low-cost and mechanized
Vineyard Establishment: 4 years!

Year 1: Site Selection and Field Prep

Year 2: Planting and Trellis

Year 3: Establishment

Year 4: First Harvest
<table>
<thead>
<tr>
<th>Market</th>
<th>Management</th>
<th>Upfront Investment</th>
<th>Labor Demand</th>
<th>Returns /acre</th>
<th>Time Scale to profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct-to Consumer</td>
<td>Intensive + small (1-2 acres) + Food Safety</td>
<td>$</td>
<td>++</td>
<td>moderate</td>
<td>5-8 years</td>
</tr>
<tr>
<td>Whole Sale</td>
<td>Intensive + large + Food Safety</td>
<td>$$$</td>
<td>+++</td>
<td>High</td>
<td>7-10 years</td>
</tr>
<tr>
<td>Processing</td>
<td>Low-Cost, large scale, mechanized</td>
<td>$$</td>
<td>+</td>
<td>Low</td>
<td>5-10 years</td>
</tr>
<tr>
<td>Wine Sales</td>
<td>Low-Cost, mechanized, tasting room; Events;</td>
<td>$$$$$</td>
<td>+++</td>
<td>N/A</td>
<td>7-10 years</td>
</tr>
<tr>
<td>Wine Making</td>
<td>Low-Cost, mechanized; Tasting Room, Events;</td>
<td>$$$$$$</td>
<td>++++</td>
<td>N/A</td>
<td>10-12 years</td>
</tr>
</tbody>
</table>
Rule of thumb

Investment into one acre of muscadine vineyard from establishment (Year 1) to first harvest (Year 3-4)

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

30 - 40 ft

Turn Around Space
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).

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

<table>
<thead>
<tr>
<th>Season</th>
<th>Cultivar</th>
<th>Flower type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Lane</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Mid</td>
<td>Supreme</td>
<td>Female</td>
</tr>
<tr>
<td>Mid</td>
<td>Ison</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Mid</td>
<td>Black Fry</td>
<td>Female</td>
</tr>
<tr>
<td>Mid</td>
<td>Paulk</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Late</td>
<td>Nesbitt</td>
<td>Self-fertile</td>
</tr>
</tbody>
</table>
Cultivars

Bronze Fresh-Market

<table>
<thead>
<tr>
<th>Season</th>
<th>Cultivar</th>
<th>Flower type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Hall</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Early</td>
<td>Triumph</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Mid</td>
<td>Tara</td>
<td>Self-Fertile</td>
</tr>
<tr>
<td>Mid</td>
<td>Fry</td>
<td>Female</td>
</tr>
<tr>
<td>Late</td>
<td>Late Fry</td>
<td>Self-fertile</td>
</tr>
</tbody>
</table>
## Processing Cultivars

<table>
<thead>
<tr>
<th>Color</th>
<th>Cultivar</th>
<th>Flower type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark</td>
<td>Noble</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Bronze</td>
<td>Carlos</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Bronze</td>
<td>Doreen</td>
<td>Self-fertile</td>
</tr>
<tr>
<td>Bronze</td>
<td>Magnolia</td>
<td>Self-fertile</td>
</tr>
</tbody>
</table>

Photo courtesy: Dr. Patrick Conner, University of Georgia
Planting Rules:

- Planting always in Spring of Year 2 after the last frost
- 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
- Cultivars such as Paulk or Ruby Crips needs to be ordered late Summer
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
One year old vines (planted in Spring)

Good vigor

Weak vigor
One year old vines (planted in Spring)

**Good vigor**

**Weak vigor**
Two year old vines

Good vigor

Weak vigor
Two year old vines

Good vigor

Weak vigor
Fertility
• Soil and plant nutrient testing: Routine task (every spring!!!)
• Whole leaf samples (60-80) should be collected and send to a tissue nutrient testing service during bloom
Fertility mature vines

- Apply fertilizer 2-3 times per year, not later than June
- Use Calcium Nitrate, Ammonium Nitrate, or full-spectrum fertilizer

<table>
<thead>
<tr>
<th>Element (Unit)</th>
<th>Optimal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen (%)</td>
<td>1.65–2.15</td>
</tr>
<tr>
<td>Phosphorus (%)</td>
<td>0.12–0.18</td>
</tr>
<tr>
<td>Potassium (%)</td>
<td>0.8–1.2</td>
</tr>
<tr>
<td>Calcium (%)</td>
<td>0.7–1.1</td>
</tr>
<tr>
<td>Magnesium (%)</td>
<td>0.15–0.25</td>
</tr>
<tr>
<td>Boron (ppm)</td>
<td>15–25</td>
</tr>
<tr>
<td>Copper (ppm)</td>
<td>5–10</td>
</tr>
<tr>
<td>Iron (ppm)</td>
<td>60–120</td>
</tr>
<tr>
<td>Manganese (ppm)</td>
<td>60–150</td>
</tr>
<tr>
<td>Molybdenum (ppm)</td>
<td>0.14–0.35</td>
</tr>
<tr>
<td>Zinc (ppm)</td>
<td>18–35</td>
</tr>
</tbody>
</table>
Fertility young vines

<table>
<thead>
<tr>
<th>Vine Age</th>
<th>Irrigation</th>
<th>Fertilizer</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Yes</td>
<td>Every 3-4 weeks, starting 2 weeks after planting</td>
<td>Planting – August</td>
</tr>
<tr>
<td>Year 2</td>
<td>Yes</td>
<td>Every 2 Months</td>
<td>April – August</td>
</tr>
<tr>
<td>Mature</td>
<td>No</td>
<td>2 times per year</td>
<td>April - June</td>
</tr>
</tbody>
</table>

- Frist year: Fertilize in a 12-18 inch circle around the plant
- Second year: increase the circle, fertilize less frequent, keep plant irrigated if longer stretches without rain
Management
Summer Vineyard Management

- Fertilizing
- Weed Control (chemical and mowing)
- Hedging and Skirting;
- Disease and Pest Control
• Minimize competition for resources (especially young plantings)
• Give access to crew and machinery.
• Avoid the build up of pest populations.
• Herbicide Resistance is a problem.
<table>
<thead>
<tr>
<th>Vine Age</th>
<th>Vine Shelter (‘Growtube’)</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Yes</td>
<td>Otyzalin + Paraquat; Fusalide, Poast or Clethodium</td>
</tr>
<tr>
<td>Year 2</td>
<td>Yes</td>
<td>Glyphosate, Paraquat, Glufosinate, Poast</td>
</tr>
<tr>
<td>Mature</td>
<td>No</td>
<td>Paraquat, Glufosinate, Poast</td>
</tr>
</tbody>
</table>

[https://smallfruits.org/](https://smallfruits.org/)
Under Vine Weed Control
Insect Pests

- Scout for Root Borer. Use root borer pheromone traps (1 trap/2 acres of vineyard).
- Scout for stink bugs, beetles etc. Spray if necessary (especially in fresh-market operations)
Canopy Management

- Skirting is the process of trimming vine growth to increase air flow and avoid herbicides from damaging the vine.
- Skirting should be done in late Summer, when vines become vigorous.
- Vine canopy should be skirted *Knee High*
- Hedging is the process of cutting the growth at the top and sides of the vines
- Hedging allows more air flow into the canopy
- Hedging allows harvest machines or picking crew to go through the vineyard more efficient
- Hedging should be done shortly (1-2 weeks before harvest)
https://grapes.ces.ncsu.edu/
https://smallfruits.org/
https://content.ces.ncsu.edu/muscadine-grape-production-guide
Thank You

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