

First Years of Vineyard Establishment

How to make a small fortune *starting with a large fortune*

NC STATE
UNIVERSITY



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F-U-P Rule!

F = The **FIRST** years are critical

U = Costs and time effort are often **UNDERESTIMATED**

P = **PLAN** 10 years ahead

Overview



Year 1: Field Establishment



Year 2: Posts, Trellis, Planting

Year 3+4: Training



Year 5: First Harvest



Year 1: Field Establishment



F = The **FIRST** years are critical

Year 1: Field Establishment

Decisions:

- Drainage (air and soil!)
- Row Orientation
- Planting Space (Pruning system, Trellis System)
- Row Spacing (Equipment)
- pH, other Nutrients (Phosphorous??) (Soil Tests!!)

Tasks:

- Land Clearance
- Land Ripping/Preparation
- Land Leveling
- **Liming, adding other nutrients**
- Cover Crops
- **Row Marking**
- **Herbicide strips!**

Year 1: Field Establishment

Item	Costs/acre (\$)	Hours
TOTAL LABOR	1589.5	
Temp Labor	589.5	45
<i>Land Cleaning</i>	<i>567.7</i>	<i>42</i>
<i>Ripping</i>	<i>51.9</i>	<i>3.9</i>
<i>Liming</i>	<i>189</i>	<i>14</i>
<i>Grass/Cover Crops</i>	<i>190</i>	<i>14.6</i>
<i>Flagging and Rows</i>	<i>104</i>	<i>7.9</i>
<i>Herbicide Application</i>	<i>614</i>	<i>46.9</i>
Salary (Manager/Assist)	1000	
TOTAL MATERIALS	1460	
<i>Oil/Fuel</i>	<i>150</i>	
<i>Chemicals</i>	<i>200</i>	
<i>Supplies</i>	<i>210</i>	
<i>Equipment</i>	<i>1000</i>	
TOTAL	3049.5	

Year 1: Field Establishment



Year 1: Field Establishment

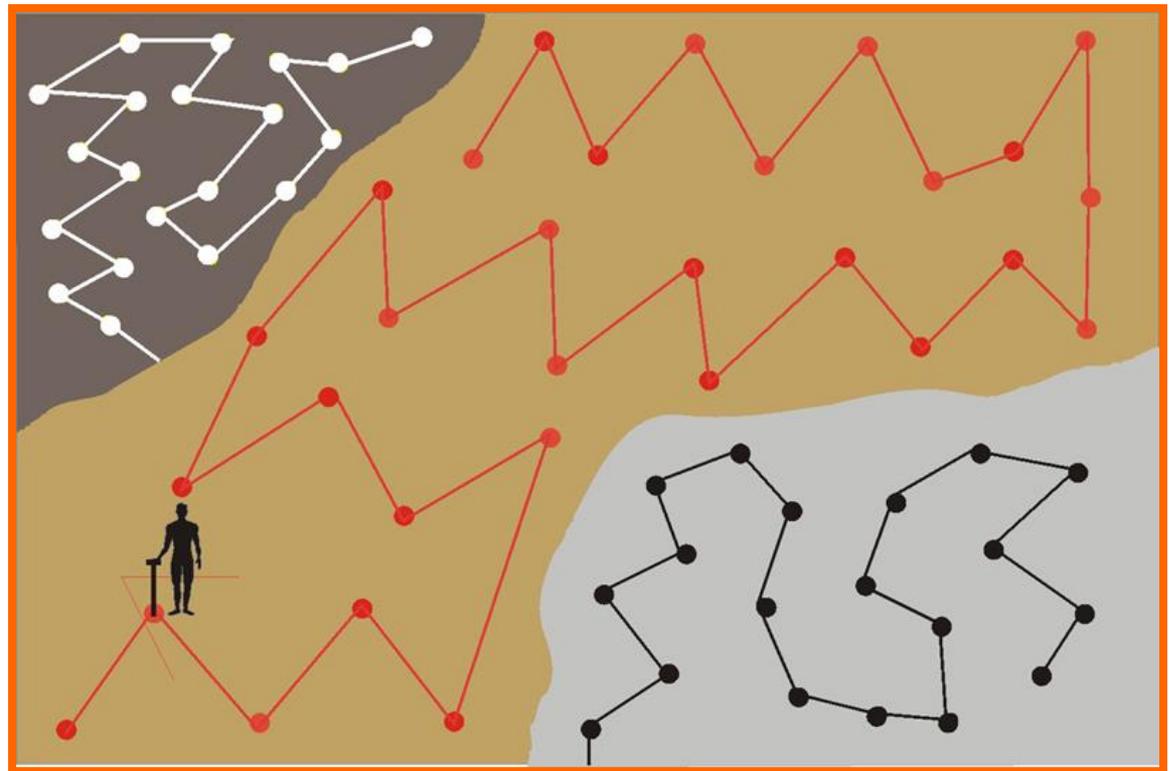
Lime!! pH → 6.0-7.0

Year 1: Field Establishment

Sampling depth:

- **0-8 inches**
- **8-16 inches**

**Min 6-12 months
before planting**



Year 1: Field Establishment

Based on your soil samples

Send soil samples to

www.ncagr.gov/agronomi/sthome.htm

Fertilizer rule of thumb:

Optimal pH: 6.0-7.0

Phosphorous (P) is very immobile: apply only if your soil samples is low on phosphorous.

Optimal P in soil 30 ppm of P

*Potassium (K) also moves relatively slow: controversial: too much K can alter juice chemistry
(elevated pH levels)*

Optimal K in soil: 40 ppm of K (recommendations from Virginia)

Year 1: Field Establishment

What to do?

- Lime (not Gypsum unless you want to reduce Al toxicity)
- Dolomitic Lime adds Mg as well!
- Incorporate as deep as possible (not just apply on top of row!!)
- It takes time!!!!

Year 1: Field Establishment

Nutrition Monitoring

- **The TRI-PARTITE APPROACH**
- At least once a year soil samples
- Twice a year petiole samples (3rd year +)
- Visual assessment of foliage

Year 1: Field Establishment



Year 1: Field Establishment



Year 1: Field Establishment

Mark the rows and post locations!

Row Spacing (10, 11, 12 ft?)

Post Spacing (25 ft)

Herbicide application: 3.5-4 ft strip

Roundup

Tractor Turnaround (30-40 ft)

Year 1: Field Establishment



Year 2: Posts, Planting, Trellis



U = Costs and time effort are often **UNDERESTIMATED**

Year 2: Posts, Planting, Trellis

Decisions:

- Cultivar Choice
- Planting Space
- Trellis System
- Pruning and Training System

Tasks:

- Planting
- Trellis Establishment
- Training

Year 2: Posts, Planting, Trellis

Item	Costs/acre	Hours (if labor)
TOTAL LABOR	5596.28	
Temp Labor	2882	220
<i>Posts</i>	<i>567.7</i>	<i>50</i>
<i>Trellis</i>	<i>51.9</i>	<i>80</i>
<i>Planting</i>	<i>189</i>	<i>50</i>
<i>Training/Hedging</i>	<i>190</i>	<i>40</i>
Salary (Manager/Assist)	<i>2714.28</i>	

Year 2: Posts, Planting, Trellis

Item	Amount	Costs/acre
TOTAL LABOR		5,596.98
Trellis		2,601
<i>Vineyard Posts</i>	<i>160</i>	<i>1,040</i>
<i>Brace Posts</i>	<i>55</i>	<i>440</i>
<i>Wire (# 9 (Catchwire))</i>	<i>3 100lbs rolls</i>	<i>270</i>
<i>Wire (#HT 12.5)</i>	<i>7 100 lbs rolls</i>	<i>630</i>
<i>Wire Clips</i>	<i>1400</i>	<i>84</i>
<i>Staples</i>	<i>5 lbs</i>	<i>4</i>
<i>Markers</i>	<i>900</i>	<i>63</i>
Plants	800	7200
Oil/Fuel/Chemicals etc		1150
Depreciarion	Tractors/Sprayers etc.	860
TOTAL COSTS		16,427

Year 2: Posts, Planting, Trellis

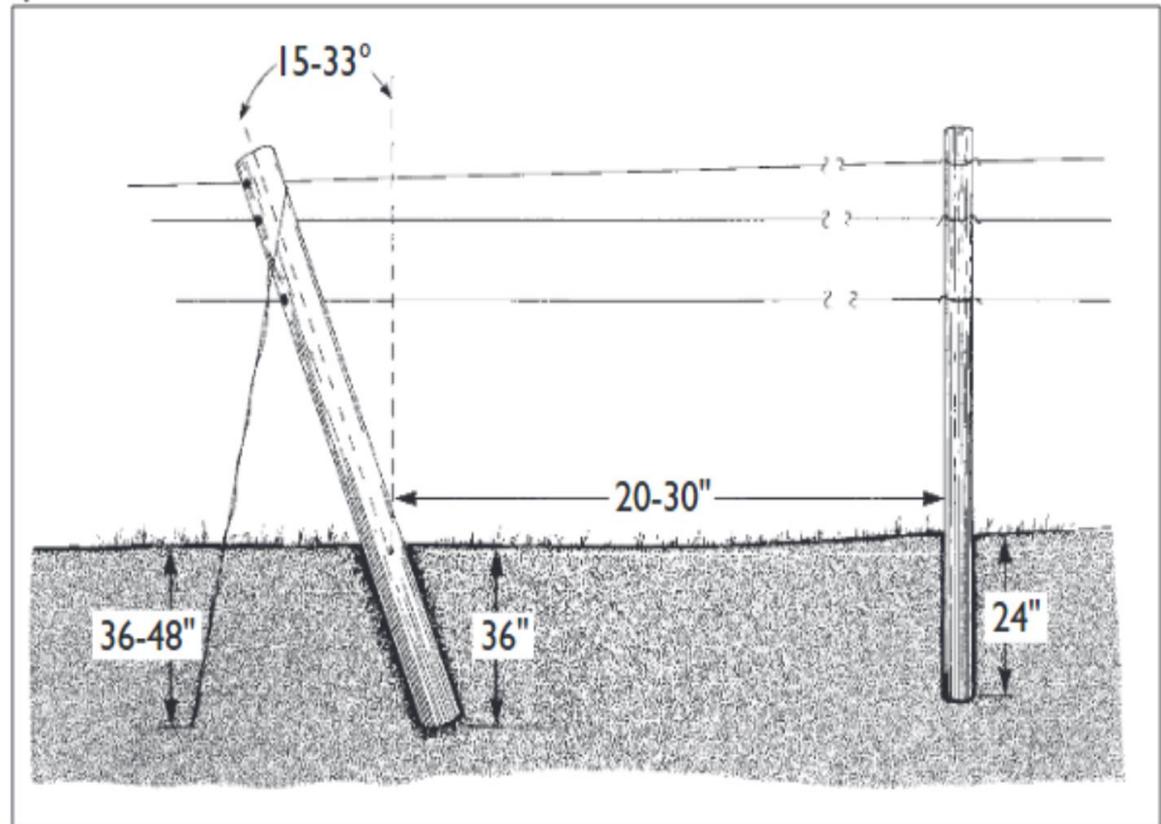
Posts!

Do NOT Auger in

Use post driver

Bracepost: min 3 feet below

Vineyardpost: min 2 feet



Year 2: Posts, Planting, Trellis

Manual planting

Auger

Shovel

Some fertilizer

Planting hole deep enough

Filling material



Year 2: Posts, Planting, Trellis

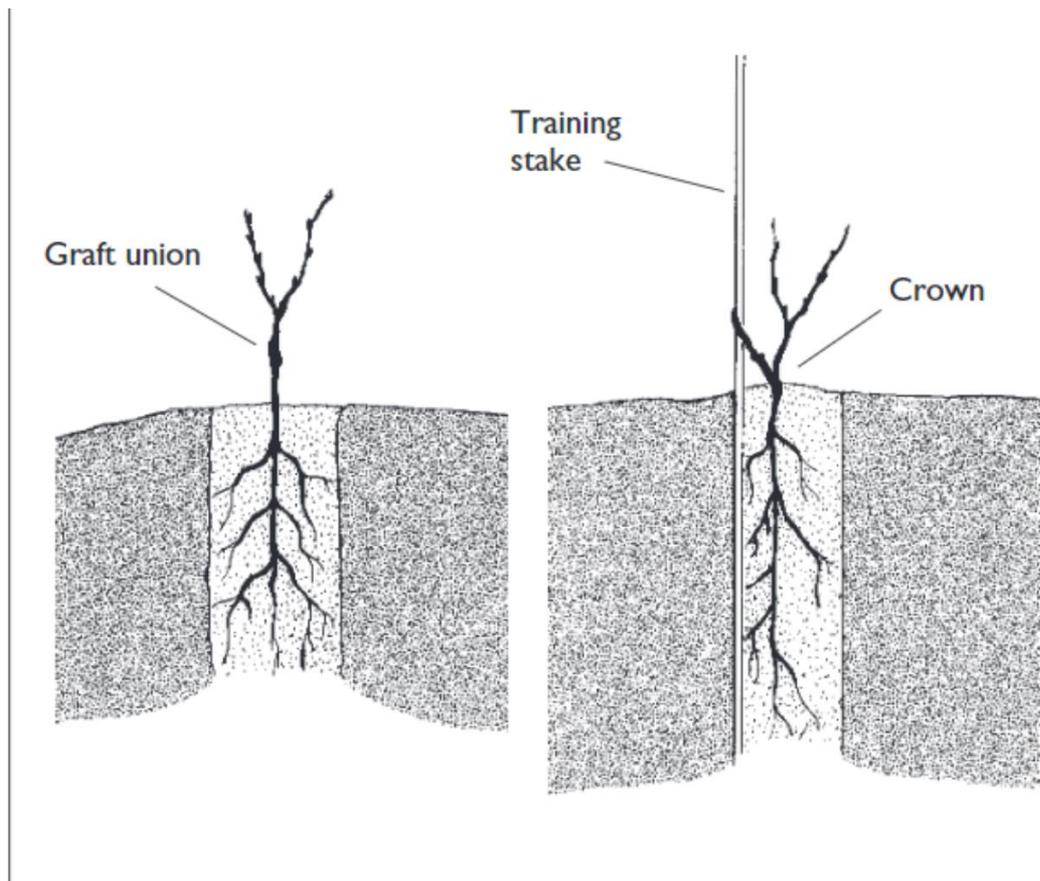
Manual planting

No root curling!

Grafting Union above ground

Crown (own-rooted only)

Above ground



Year 2: Posts, Planting, Trellis

Training stake

Train vines straight up

Put at least bottom wire on posts.

Better all trellis

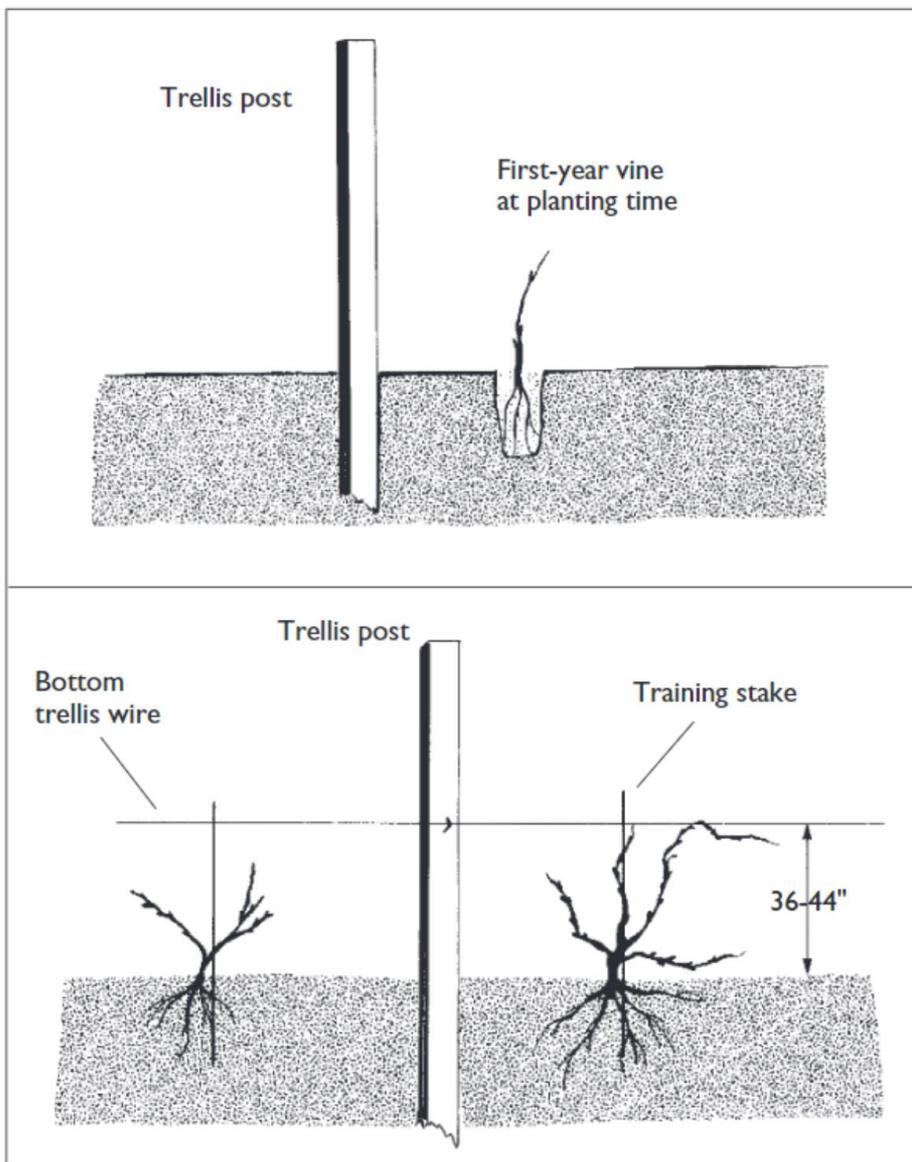
Keep vines off the ground

Train two trunks

Drop clusters

Vine Shelters: Better weed control

Watering?



Year 2: Posts, Planting, Trellis

Trellis

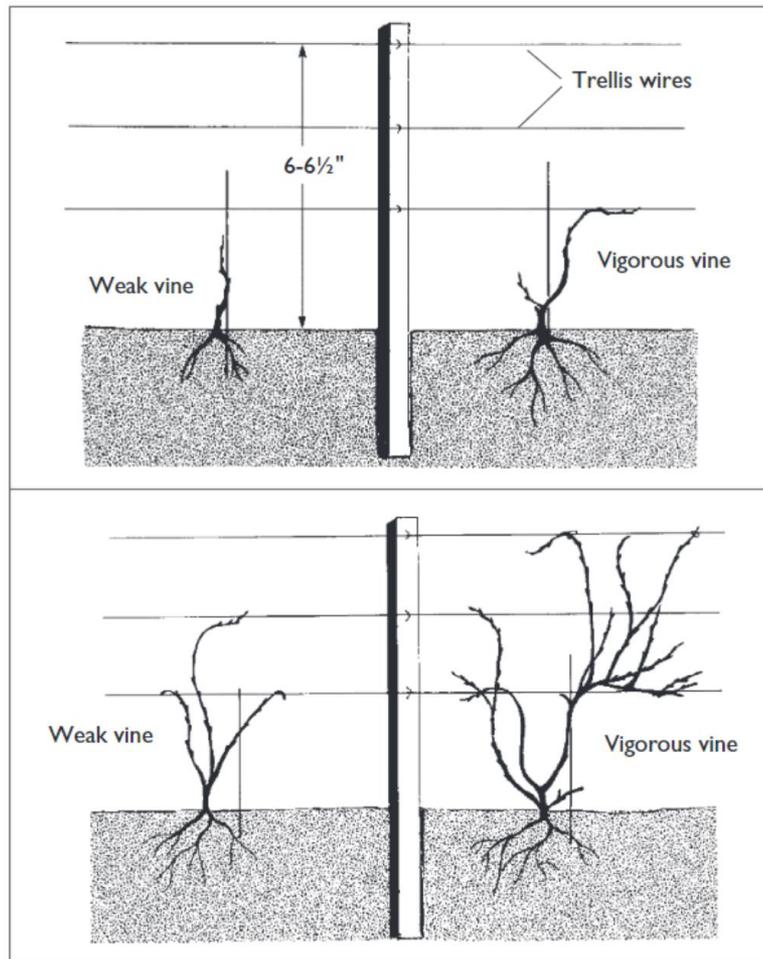
Perform trellis building step by step

Through vineyard

Use HT 11-12.5 wire with min 170,000 lbs breaking point

Wire distance 12 inches from each other.

Cordonwire 30 in up the ground



Year 2: Posts, Planting, Trellis

Production Year	Time of Application	Fungicide	Application Rate (per acre)
1	May	mancozeb 75 DF +	3.0 lb
		Nova 40W	4.0 oz
	June	mancozeb 75 DF +	2.5 lb
		Nova 40W	4.0 oz
	June	Abound 2SC	11.5 oz
	July	captan 4 L +	2.0 qt
		Endure	8.0 oz
	August	captan 4 L	2.0 qt
	Early September	mancozeb 75 DF	3.0 lb
	2 and thereafter	April (bud break)	mancozeb 75 DF zzzzzzz
April (1-2 in. shoot)		mancozeb 75 DF +	3.0 lb
		sulfur	4.0 lb
May (10-in. shoot)		mancozeb 75 DF +	3.0 lb
		sulfur	4.0 lb
May (prebloom)		mancozeb 75 DF +	3.0 lb
		Nova 40W	4.0 oz
May (bloom)		Elevate 50 WDG	1.0 lb
May (fruit set)		Abound 2SC	11.5 oz
June (shatter)		mancozeb 75 DF +	3.0 lb
		Nova 40W	4.0 oz
June (first cover to veraison)		captan 50WP +	3.0 lb
		sulfur	4.0 lb
June (second cover to veraison)		captan 4L	2.0 qt
July (veraison)		captan 4L	2.0 qt
July (veraison to harvest)		captan 4L	2.0 qt
		Endure	8.0 oz
August	Pristine	10.5 oz	
Early September (postharvest)	mancozeb 75 DF	3.0 lb	

Captan and Mancozeb: Backbone Program!!

Start EARLY after planting!!

Year 2: Posts, Planting, Trellis

Production Year	Time of Application	Herbicide	Application Rate (per a
0 (preparation)		glyphosate	2.8 pt
1	May	oryzalin (Surflan 4 AS)	2.0 qt
	June	oryzalin (Surflan 4 AS)	2.0 qt
		+paraquat (Gramoxone Max 3 SL)	1.7 pt
	August	clethodim (Select 2EC)	6.0 oz
	September	clethodim (Select 2EC)	6.0 oz
2 and 3	May	oryzalin (Surflan 4 AS)	2.0 qt
		+paraquat (Gramoxone Max 3 SL)	1.7 pt
	June	paraquat (Gramoxone Max 3 SL)	1.7 pt
	August (spot treatments)	glyphosate (Roundup WeatherMax 5.5 SL)	1.4 pt
	September (spot treatments)	glyphosate (Roundup WeatherMax 5.5 SL)	1.4 pt
4 and thereafter	Mid-March	flumioxazin (Chateau 5 I WDG)	6.0 oz
		+ glyphosate (Roundup WeatherMax 5.5 SL)	1.4 pt
	June (early)	flumioxazin (Chateau 5 I WDG)	6.0 oz
		+ glyphosate (Roundup WeatherMax 5.5 SL)	1.4 pt
	July	paraquat (Gramoxone Max 3 SL)	1.7 pt
	August	paraquat (Gramoxone Max 3 SL)	1.7 pt
	September	simazine (Princep 4 L)	2.0 qt
		+paraquat (Gramoxone Max 3 SL)	1.7 pt

Weed Control is IMPORTANT

Year 2: Posts, Planting, Trellis



Year 3+4: Training



U = Costs and time effort are often **UNDERESTIMATED**

Year 3+4: Training

Decisions:

- Vine health

Tasks:

- Drop fruit
- Develop healthy root system and cordon system
- Screen for diseases
- Replant
- Disease Control

Year 3+4: Training

Item	Costs/acre	Hours (if labor)
TOTAL LABOR	4074.11	
Temp Labor	1359.83*	103.8
<i>Pruning</i>	233.92	17.8
<i>Raking</i>	23.3	1.7
<i>Tying</i>	32.75	2.5
<i>Shoot Thinning</i>	46.78	3.57
<i>RePlanting</i>	104.5	7.98
<i>Leaf Pulling</i>	0	0
<i>Training</i>	614.2	46.89
<i>Hedging</i>	233.92	17.85
<i>Fruit Thinning</i>	46.78	3.57
<i>Cleaning</i>	23.39	1.78
<i>Harvest</i>	0	0
Salary (Manager/Assist)	2714.28	

Year 3+4: Training

Item	Costs/acre
Materials	1913.68
<i>Oil/Fuel/Lubricants</i>	<i>107</i>
<i>Chemicals</i>	<i>714.28</i>
<i>Maintenance/Repairs</i>	<i>89.28</i>
<i>Supplies</i>	<i>143.85</i>
<i>Depreciation</i>	<i>860.1</i>

Item	Costs/acre
Labor	4074.11
Material	1913.68
TOTAL COSTS/Acre	5987.79

Year 3+4: Training

Year	Costs/acre
Year 1	\$ 3,049.5
Year 2	\$ 16,427
Year 3	\$ 5987.79
Year 4	\$ 5987.79
TOTAL	\$ 31,452.08

After 4 years: \$31,500 were spend per acre without returns!

P = better PLAN 10 years ahead

Year 3+4: Training

Training

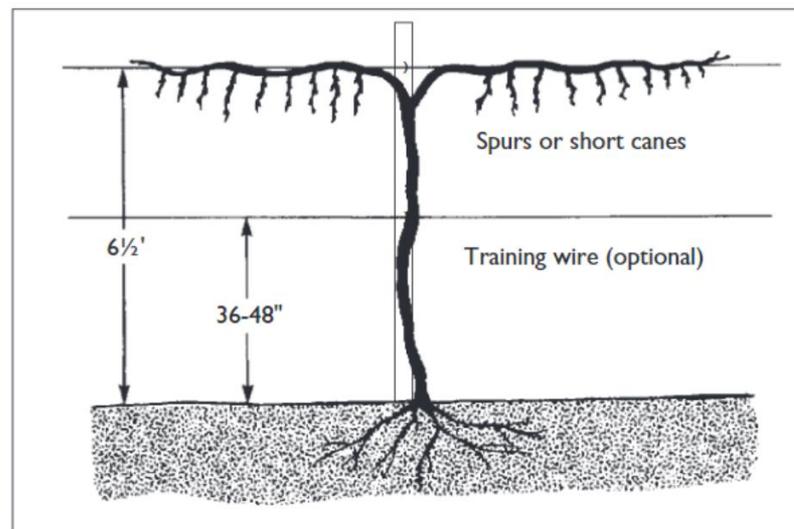
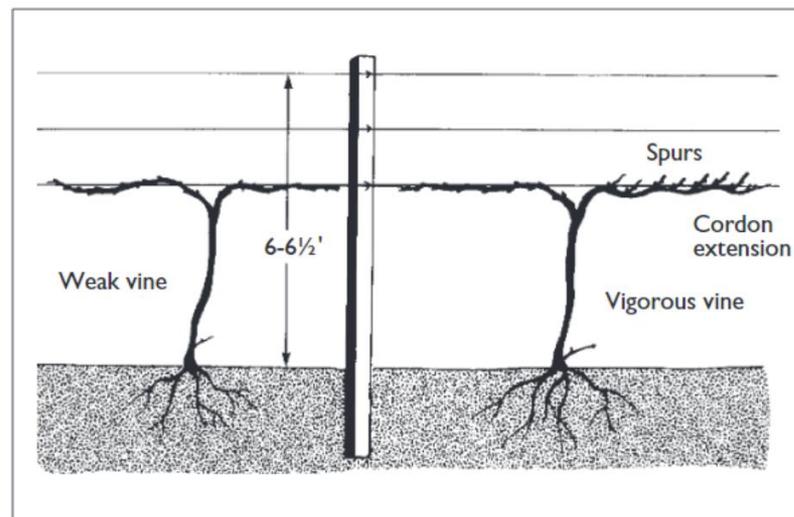
Don't harvest

Scout for injury or disease

Replace dead or very weak vines

Vines won't be all at the same pace

DISEASE CONTROL!!!!



Year 3+4: Training

Production Year	Time of Application	Fungicide	Application Rate (per acre)
1	May	mancozeb 75 DF +	3.0 lb
		Nova 40W	4.0 oz
	June	mancozeb 75 DF +	2.5 lb
		Nova 40W	4.0 oz
	June	Abound 2SC	11.5 oz
	July	captan 4 L +	2.0 qt
		Endure	8.0 oz
August	captan 4 L	2.0 qt	
2 and thereafter	Early September	mancozeb 75 DF	3.0 lb
	April (bud break)	mancozeb 75 DF zzzzzzz	3.0 lb
	April (1-2 in. shoot)	mancozeb 75 DF +	3.0 lb
		sulfur	4.0 lb
	May (10-in. shoot)	mancozeb 75 DF +	3.0 lb
		sulfur	4.0 lb
	May (prebloom)	mancozeb 75 DF +	3.0 lb
		Nova 40W	4.0 oz
	May (bloom)	Elevate 50 WDG	1.0 lb
	May (fruit set)	Abound 2SC	11.5 oz
	June (shatter)	mancozeb 75 DF +	3.0 lb
		Nova 40W	4.0 oz
	June (first cover to veraison)	captan 50WP +	3.0 lb
		sulfur	4.0 lb
	June (second cover to veraison)	captan 4L	2.0 qt
	July (veraison)	captan 4L	2.0 qt
July (veraison to harvest)	captan 4L	2.0 qt	
	Endure	8.0 oz	
August	Pristine	10.5 oz	
Early September (postharvest)	mancozeb 75 DF	3.0 lb	

Year 5: First Harvest



P = PLAN 10 years ahead

Year 5: First Harvest

Item	Costs/acre	Hours (if labor)
TOTAL LABOR	5920.51	
Temp Labor	3206.22	244.75
<i>Pruning</i>	<i>567.7</i>	<i>42</i>
<i>Raking</i>	<i>51.9</i>	<i>3.9</i>
<i>Tying</i>	<i>189</i>	<i>14</i>
<i>Shoot Thinning</i>	<i>190</i>	<i>14.6</i>
<i>RePlanting</i>	<i>104</i>	<i>7.9</i>
<i>Leaf Pulling</i>	<i>681</i>	<i>46.9</i>
<i>Stuffing</i>	<i>573</i>	<i>43.8</i>
<i>Hedging</i>	<i>21</i>	<i>1.6</i>
<i>Fruit Thinning</i>	<i>55</i>	<i>4.2</i>
<i>Cleaning</i>	<i>444</i>	<i>33.9</i>
Harvest	393	30
Salary (Manager/Assist)	2714.28	

Year 5: First Harvest

Item	Costs/acre
Materials	2277.96
<i>Oil/Fuel/Lubricants</i>	<i>150</i>
<i>Chemicals</i>	<i>964.28</i>
<i>Maintenance/Repairs</i>	<i>89.28</i>
<i>Supplies</i>	<i>214.28</i>
<i>Depreciation</i>	<i>860.1</i>

Item	Costs/acre
Labor	5920.51
Material	2277.96
TOTAL COSTS/Acre	8198.14

Year 5: First Harvest

Item	Costs/acre
Labor	5920.51
Material	2277.96
TOTAL COSTS/Acre	8198.47
Total yield/acre	1.49 tons
Costs/ton	5,502

Year 6+: Harvest

Item	Costs/acre
Labor	6209.18
Material	2277.96
TOTAL COS/Acre	8487.14
Total yield/acre	2.98 tons
Costs/ton	2839.19

Item	Costs/acre
Costs/ton wo salary	1931.18

F-U-P Rule!

F = The **FIRST** years are critical

U = Costs and time effort are often **UNDERESTIMATED**

P = **PLAN** 10 years ahead

Resources

<http://grapes.ces.ncsu.edu> (Grape Portal)

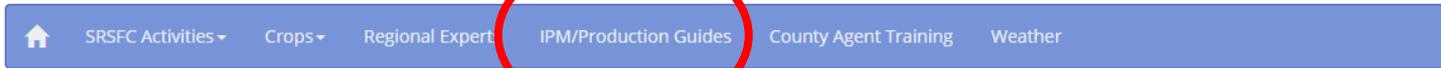
<http://www.smallfruit.org> (IPM Management Guides)

The screenshot displays the website for Muscadine and Vinifera Grapes. The main header is a red box with the text "Muscadine and Vinifera Grapes". Below this is a navigation menu with several red buttons: "Meet Our Staff", "Events", "NEW: Grape and Wine Forum", "Resources" (highlighted with a blue arrow), "Muscadines Bunch Grapes", "Grape Diary", "Production", "Pest Management", "Marketing", "Freeze Damage", and "Cultivars". The "Resources" button is highlighted with a blue arrow. To the right of the navigation menu is a search bar with the text "Search". Below the navigation menu is a section titled "Events" with a left arrow. The events section contains three event cards: 1. "Annual Georgia End-of-the-Year Viticulture" on Monday, December 16, from 9 AM to 4 PM, 7 hours away. 2. "Annual North Carolina End-of-the-Year Viticulture Roundup" on Tuesday, December 17, from 9:30 AM to 5 PM, tomorrow. 3. "Annual Muscadine Growers Conference" on Friday, January 17, 2020, from Jan 17 to Sat Jan 18, 2020, 1 month away.

Resources: Vineyard Management?

www.smallfruits.org

the Southern Region small fruit consortium



IPM/Production Guides

Last updated Friday 5 January 2018 8:9 GMT

Blueberries

- [Southeast Regional Blueberry Integrated Management Guide](#)
- [Southeast Regional Blueberry Horticulture and Growth Regulator Guide](#)
- [Southeast Regional Organic Blueberry Pest Management Guide](#)

Bunch Grapes

- [Southeast Regional Bunch Grape Integrated Management Guide](#)

Caneberries

- [Southeast Regional Caneberries Integrated Management Guide](#)
- [Southeast Regional Caneberry Production Guide \(PDF\)](#)
- [Southeast Regional Caneberry Production Guide \(Online Version\)](#)

Muscadines

- [Southeast Regional Muscadine Grape Integrated Management Guide](#)

Strawberries

- [Southeast Regional Strawberry Integrated Pest Management Guide](#)
- [Southeast Regional Strawberry Plasticulture Production Guide](#)
- [Fungicide Selection for Botrytis and Anthracnose Fruit Rot Management 2017](#)

Resources: Vineyard Management?

www.smallfruits.org

2018 Southeast Regional Bunch Grape Integrated Management Guide

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A product of the Southern Region Small Fruit Consortium (www.smallfruits.org). Recommendations are based on information from the manufacturer's label and performance data from research and extension field tests. Because environmental conditions and grower application methods vary widely, suggested use does not imply that performance of the pesticide will always conform to the safety and pest control standards indicated by experimental data. This publication is intended for use only as a guide. Specific rates and applications methods are on the pesticide label, and these are subject to change at any time. Always refer to and read the pesticide label before making any application! The pesticide label supersedes any information contained in this guide, and it is the legal document referenced for application standards.

Thank you!

Q+A
**Thank you for your
attention**

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