Tools, Jargon & Timeline of Creating a Vineyard

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Grape & Wine Conference
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Year 1 Out of Pocket Cost/Acre

August/September

2 soil samples @ $16 $ 32.00
2 qts of Glyphosate @$24/gal $ 12.00
200 lbs of Phosphorous (P205) @ 60 cents/lb $120.00
200 lbs of Potassium (K20) @ 40 cents/lb $ 80.00
2 tons of Quarry Lime @ $14/ton spread $ 28.00
Disk 2X @ $16/trip $ 32.00
Broadcast 50 lbs of Bluegrass Seed @ $2.50 lb $ 125.00
Harrow & level area @ $10 $ 10.00

Total  $ 439
<table>
<thead>
<tr>
<th>Item Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>10 – 435’ rows 10’ x 8’ between plants</td>
<td></td>
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<tr>
<td>545 plants @ $2.50</td>
<td>$1,363</td>
</tr>
<tr>
<td>545 5/8” x 7’ bamboo poles @ 46¢</td>
<td>$ 273</td>
</tr>
<tr>
<td>545 36” clipper grow tubes @ $1.12</td>
<td>$ 611</td>
</tr>
<tr>
<td>162 3-4”x8’ line posts @ $6.50</td>
<td>$1,053</td>
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<tr>
<td>20 5-6”x 9’ end posts @ $17</td>
<td>$ 340</td>
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<tr>
<td>Approx. 4750’ 12.5 ga Hi-Tensile Wire @ 23¢/ft</td>
<td>$1,093</td>
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<tr>
<td>Fencing tool @ $130 &amp; Wire puller @ $80</td>
<td>$ 210</td>
</tr>
<tr>
<td>10 Wire Strainers @ $2.75 &amp; 8# of 2” staples @ $10</td>
<td>$ 38</td>
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</tbody>
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Subtotal $4,981
### A Typical Year in the Vineyard

**Approximately 150-200 hrs/ac/yr**

<table>
<thead>
<tr>
<th>Month</th>
<th>Tasks</th>
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| Feb/March | - Prune  
|          | - Lime Sulfur application  
|          | - 1x mow                                                                 |
| April   | - 1x spray insecticide  
|          | - 2x spray fungicide  
|          | - 2x mow  
|          | - 1x spray herbicide  
|          | - 1x foliar fertilizer                                                |
| May     | - 2x mow  
|          | - 1x spray fungicide  
|          | - 2x spray fungicide                                                  |
| June    | - canopy management  
|          | - 1x foliar fertilizer                                                |
|         | - 2x mow  
|         | - 2x spray fungicide                                                  |
| July    | - 1x spray fungicide  
|          | - 1x spray post herbicide                                              |
|         | - 1x mow  
|         | - foliar leaf thinning around grapes                                    |
| Aug     | - 1x spray fungicide  
|          | - 1x mow  
|          | - petiole testing for fertilizer                                        |
|         | - begin harvest                                                      |
| Sept    | - Brix/TA/pH testing of grapes                                         |
| Oct.    | - continue harvest                                                     |
|         | - continue Brix/TA/pH tests                                            |
|         | - finish up harvest                                                    |
|         | - continue Brix/TA/pH testing of grapes                                |
Year 2 Out of Pocket Cost/Acre

10 – 435’ rows 10’ x 8’ between plants – Single High Wire

40 12.5 ga. Wire Gripples @ $1.76 $ 71

20 ¾” shank x 48” long x 6” helix earth anchors $6.45 $ 129

20 lbs (17’/lb) #9 wire @ $1/lb $ 20

6,000 #8 2 5/8” T Bands $ 264

Max Tapener & extra tape $ 75

Glyphosate/Chateau/Prowl H20 Herbicide $ 11

Year 1 $439 Year 2 = $5,551 Year 1 & 2 = $5,990
Year 3  Out of Pocket Cost/Acre

10 – 435’ rows 10’ x 8’ between plants – Single High Wire

Air Blast Sprayer

Herbicides

Fungicides & Insecticides

Refractometer (Brix Measurement)

pH tester accurate to 0.01

4356’ 17’ 30 gm wt woven bird net @ 34¢/ft

10 grape forks for picking @ $5.40

100 30’ harvest lugs @ $7.50

Yr 1 $439   Yr 2 = $5,573 Yr 1,2 = $5,990 Yr 3 = $7,697.00

Total for 3 yrs $13,709/acre

$IOWA\ STATE\ UNIVERSITY$

University Extension
In-season Canopy Management

Shoot Thinning

Remove Suckers

Leaf removal in fruiting zone.

Approximate 60-75% canopy density.

Shoot Positioning

Cluster Thinning
Planting Tools

- TREE PLANTING BAR
- AUGER
- TRACTOR MOUNTED TREE PLANTER
Pruning & Canopy Management Tools

Hand Pruners

Sharpening Stone

Loppers

Christmas Tree Shearing Knives
Bird Netting

Hooks work well with woven netting.

Netting is put into plastic garbage cans.
Prototype netting machine being used at Summerset Winery to remove extruded netting.

http://www.nettergetter.com
Herbicide Sprayers
Mechanical Weed Control Tools

- Flamer
- Disk
- Handheld flamer
- Weed Badger
Grape Testing Tools

- **Refractometer**
  - Large daylight plate allows for bright images
  - Rubber eyecup for comfortable viewing
  - All metal construction
  - Secure rubber grip
  - Smooth focus control

- **pH meter accurate to 0.01**

- **Electronic Fish Scale**
Brix

ºBx soluble solids measurement by a refractometer. Brix x 0.55 gives potential alcohol content of a wine
Harvesting Tools

- Grape Fork
- 5 gal. Bucket
- Harvest Lugs
- Grapes Shears
- Macro Bins
Harvest Tools of the Future
Trellis Hardware

12.5 ga High-tensile Wire & 9 ga Soft Wire

Wire Strainers

Crimping Sleeves

Tension Indicator Spring (Optional)

1 Strainer handle

Steel Brace Pins (for H-Brace)

Wire Vise (for Rows < 200 ft)
Wheatheart Post Pounder

Approx. $10,000+

Gary Edgington, St. Charles
Grow Tubes

Bamboo poles

Grow Tubes

H – Brace System

3-4” line post

5-7” end post
Twitching Stick

Helical 6” Screw Anchor
Forms of Agriculture used in Vineyards

Conventional Agriculture

Integrated Pest Management

Sustainable Agriculture

Organic Agriculture

Biodynamic Agriculture
Vitis labrusca – American Cultivars
Vitis vinifera – French Cultivars
French/American – Cultivars
(European Crosses)
American/French – Cultivars
(American Crosses)
Grapes have 3 buds.

- Primary
- Secondary
- Tertiary
Many Systems

Arbor

4 cane kniffin

Geneva Double Curtain

Vertical Shoot Positioned

Single curtain, bilateral cordon or high cordon

Munson Trellis
Growth Habit

Trailing / Drooping

Semi-Upright

Characteristic of American species *V. Labrusca*

*Vignoles*  
*La Crosse*  
*Chardonel*  
*Chambourcin*  
*LaCrescent ?*

Characteristic of French (*V. vinifera*) & some French-Amer. hybrids

*DeChaunac*  
*Prairie Star*  
*St. Vincent*  
*Traminette*  
*Marquette*
Terroir (Tear-Wah)

French term with no direct English Translation

Refers to how the climate, soil, landscape and other environmental factors come together and give the wine character/identity

Sometimes referred to as the “soul/essence” of the wine.
Veraison is the period of the beginning of berry ripening. The berries become soft and take on the colors characteristic of their specific varieties.
Phenoxy Drift

2,4-D or dicamba
Types of Herbicides

Soil Applied – root and or shoot uptake

Pre-emergence – apply before seeds germinate

Pre-plant Incorporated (PPI) – soil incorporated

Post Emergence – foliage sprays

Contact – need good coverage over leaf surface

Systemic – translocation within plant. Can be soil or post applied to foliage
Post Emergent Spray Adjuvants

**Spreader/Sticker**, ie…. Non-ionic surfactant.

**Spreader/Sticker/Penetrant**, ie Crop oil concentrate or methylated seed oil.

**Fertilizer Spray Enhancer**, ie… liquid 28% nitrogen or dry ammonium sulfate crystals. Softens the water.

**Drift Inhibitors**: ie…acrylic or silicone polymer that reduces spray drift by increasing viscosity and droplet size.

**Compatibility Agents**, ie…”Unite”, “Dawn dishwashing detergent” helps incompatible products mix together.

**Anti-Foaming Agent** – eliminates foam buildup in the tank
Legal Pesticide Classifications

**Restricted Use Pesticide (RUP)** - A pesticide that could cause some human injury or environmental damage even when used as directed on the label. Need a Private Applicators License to purchase and apply.

**General Use Pesticide** - No license needed to purchase or apply.
The Disease Triangle

Favorable Environment

Time

Virulent Pathogen

Susceptible Host
Major Grape Diseases

Black Rot

Black rot lesion on grape leaf.

Grape berries infected with black rot. Note the shriveled mummies.
Downy Mildew

Grape berries infected with downy mildew.

Pale yellow spots on upper surface of grape leaf caused by downy mildew.
Powdery Mildew

Grape berry cluster infected with powdery mildew.
Anthracnose
Phomopsis cane symptoms

Cracking of grape canes caused by infection by Phomopsis cane lesions are usually present only on the first 3 or 4 internodes.
CROWN GALL

Bacteria: Agrobacterium vitis

Bacteria enter the plant from soil through pruning and equipment wounds and/or freezing injury.

Stem gall and red foliage symptoms on St. Vincent Grape.

Bacterial commonly introduced through planting material.
Multicolored Asian Lady Beetle (MALB) *Harmonica axyridis*
Multicolored Asian Lady Beetle (MALB) *Harmonica axyridis*

1 beetle per 3.67 lbs. to 7.35 lbs. can taint the wine.

Methoxypyrazines
Grape Phylloxera on Leaf

Galls

Nymph inside of Gall
Phylloxera Life Cycle

- Winter Egg (A)
- Sexual forms (A)
- Winged form (E)
- Cycle on roots (C)
- Cycle on leaves (B)

Wander to other leaves
Wander to roots of other vines

Earth
Grape Phylloxera

Female, Eggs, & Nymphs
Welcome to the Midwest Grape and Wine Industry Institute!

The Midwest Grape & Wine Industry Institute at Iowa State University was approved by the Iowa Board of Regents in September 2006. The Institute is the first of its kind in Iowa.

The formation of the Institute is a result of the state's evolving grape & wine industry. Dr. Murl Dharmadhikari, ISU Extension enologist who was hired in 2005, was named director of the Institute.

Goals of the Institute include:

- Conduct research to develop new cold-hardy grape varieties that can thrive in the Midwest.
- Conduct enology (the science of wine & wine making) research.
- Develop a wine quality award program that will provide wine buyers a quality-assurance stamp of approval.
- Establish an outreach program to the industry by training a team of specialists.
- Partner with community colleges to develop job training programs specific to growing grapes and making wine.

Presently, there are approximately 67 licensed wineries and 325 vineyards in Iowa. The potential economic opportunities in wineries, value-added agriculture and tourism are limitless.

http://www.extension.iastate.edu/Wine/