



SMALL HOME VINEYARDS - II





INTRODUCTION





University of California Cooperative Extension UC MASTER GARDENERS OF NAPA COUNTY

Need more Information:

Help Desk
Monday, Wednesday, Friday
9:00 AM – 12:00 Noon
253-4143

E-mail: mastergardeners@countyofnapa.org
<http://cenapa.ucdavis.edu>

WEB SITE: WWW.IPM.UCDAVIS.ED Integrated Pest Management PEST NOTES





What questions do you have for us?

- How many have vineyards?
- How Big?
- What varieties?
- Where are they located?
- Are you aware of Integrated Pest Management (IPM)?
- Do you sell your grapes?





OUTLINE OF WHAT WE ARE COVERING TODAY

- INTRODUCTION
- CALENDAR OF EVENTS (AUGUST THROUGH JANUARY)
- BOTANY
- PRE-HARVEST
- VISIT EXPERIMENTAL VINEYARD
- LUNCH (30 MINUTES)
- HARVEST
- POST HARVEST
- PLANNING FOR A NEW VINEYARD
- Q & A





CALENDAR OF EVENTS





ANNUAL GROWTH CYCLE

-----THREE INTEGRATED CYCLES-----

- VEGETATIVE GROWTH
- CLUSTER INITIATION
- FRUIT GROWTH AND DEVELOPMENT





Fall Leaves



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Fall





ANNUAL CYCLE OF GROWTH

- FACTORS INFLUENCING GRAPE BERRY GROWTH
 - GENETICS
 - BIOPHYSICAL CONSTRAINTS
 - ENVIORNMENT
 - SOURCE/SINK RELATIONSHIPS
 - WATER STRESS





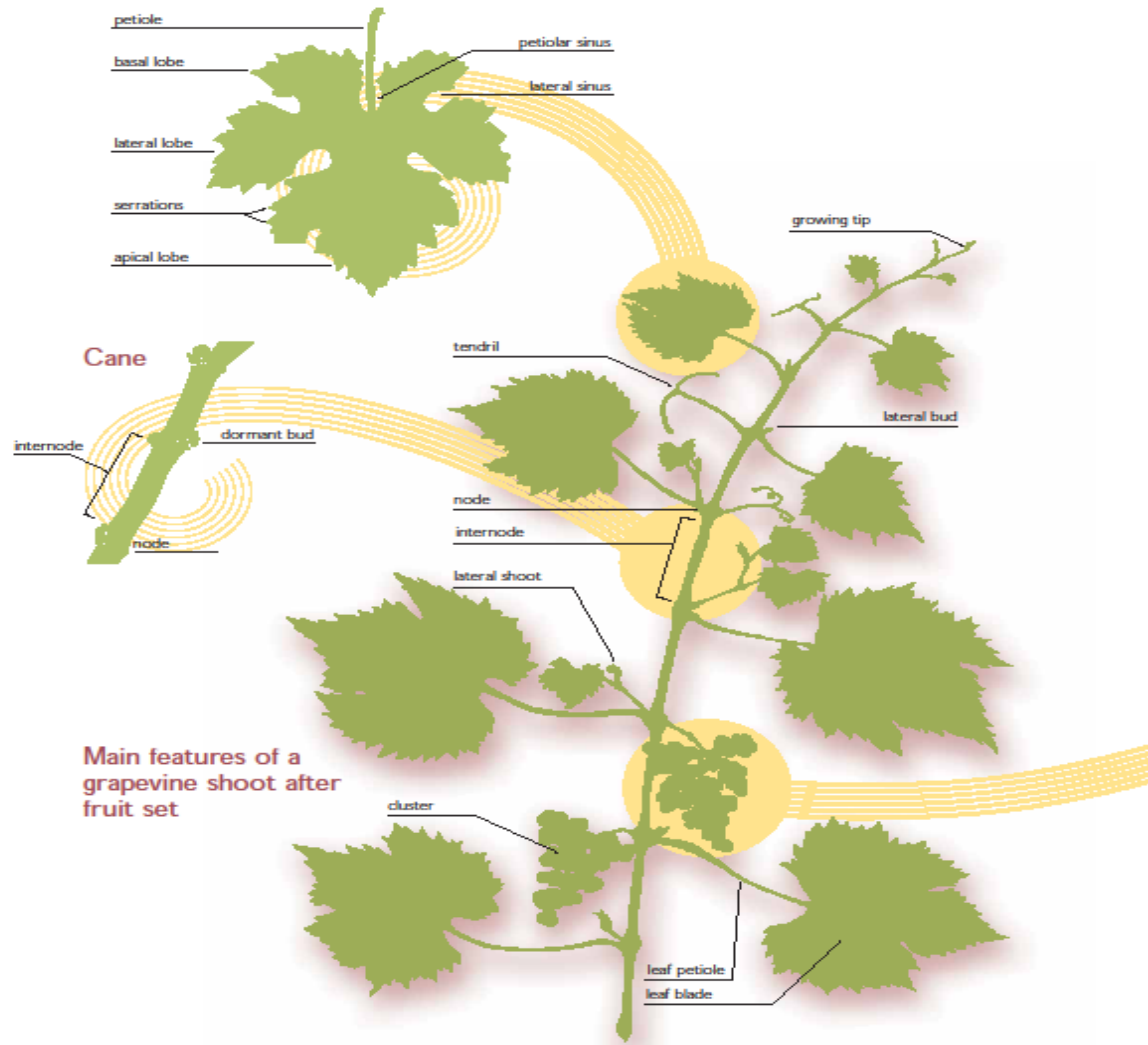
BASIC BOTANY

- What factors effect growth and ripening
- Temperature and light influences
- Carbohydrate nutrition
- Understand irrigation, nutrition, ripening and fruit quality



Wine Grapevine Structure

Typical vinifera grape leaf with five lobes



Bloom





Botany

- *Transpiration* = water loss by plants through their stomata.
- *Evaporation* = Water loss from the leaf surface
- *Evapotranspiration* relates to the rate of water use. It includes the evaporation of water from the soil surface and the movement of water from the soil through the plant and out through the leaves.
- Vines are drought resistant plants. Water only when necessary.
- The best thing is to know your plants: make visual assessments





TRANSLOCATION

- Movement of carbohydrates, some nutrients and hormones in the plant
- Occurs in the phloem
- Phloem is made up of living plant cells
- Moves upward and downward in plant
- PHLOEM= FOOD
- Sinks- food goes where needed- leaves, berries, roots





TRANSPIRATION

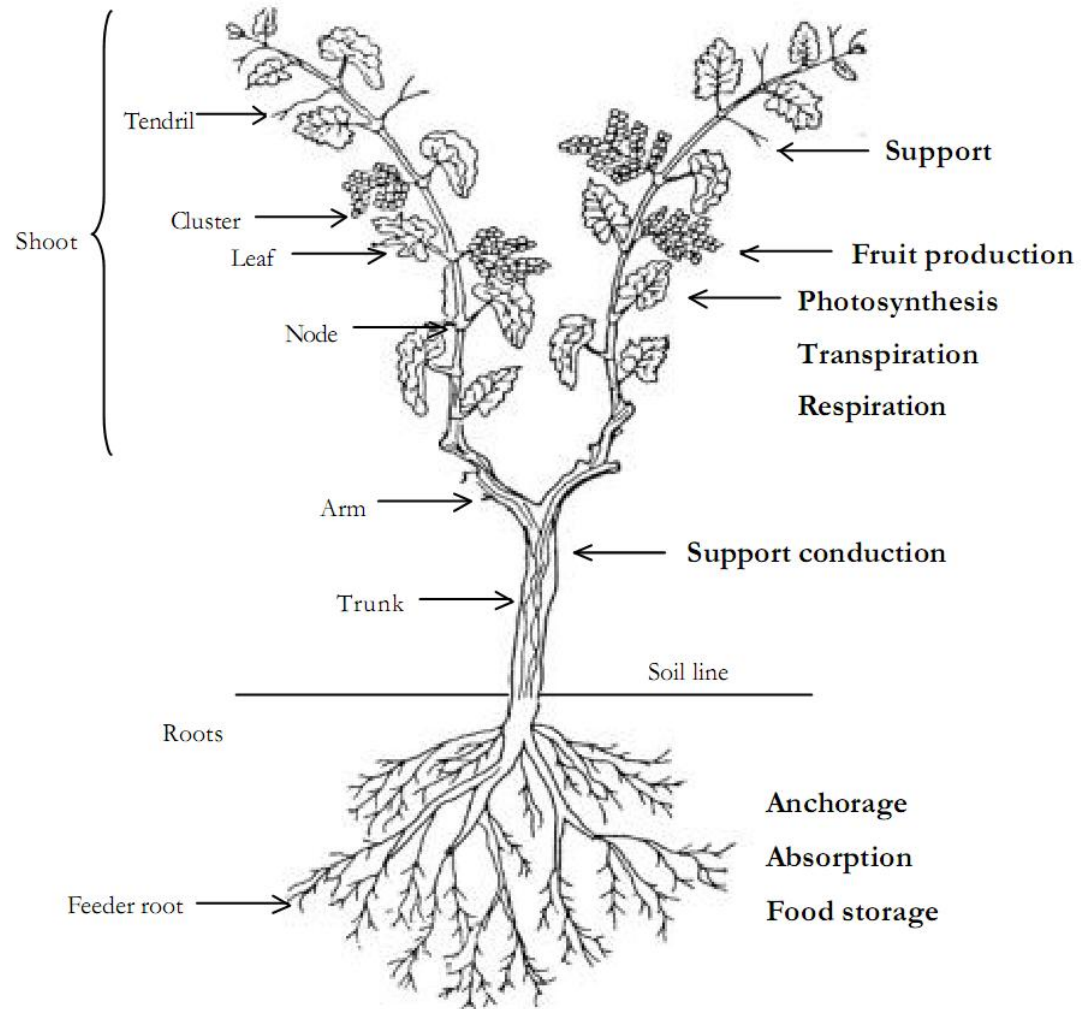
- Loss of water vapor from leaves
- Through microscopic holes called stomates
- Causes negative pressure (vacuum) and “pulls” water up through plant
- Pulls water from leaves to stems to roots to soil interface

**only moves upward in the plant

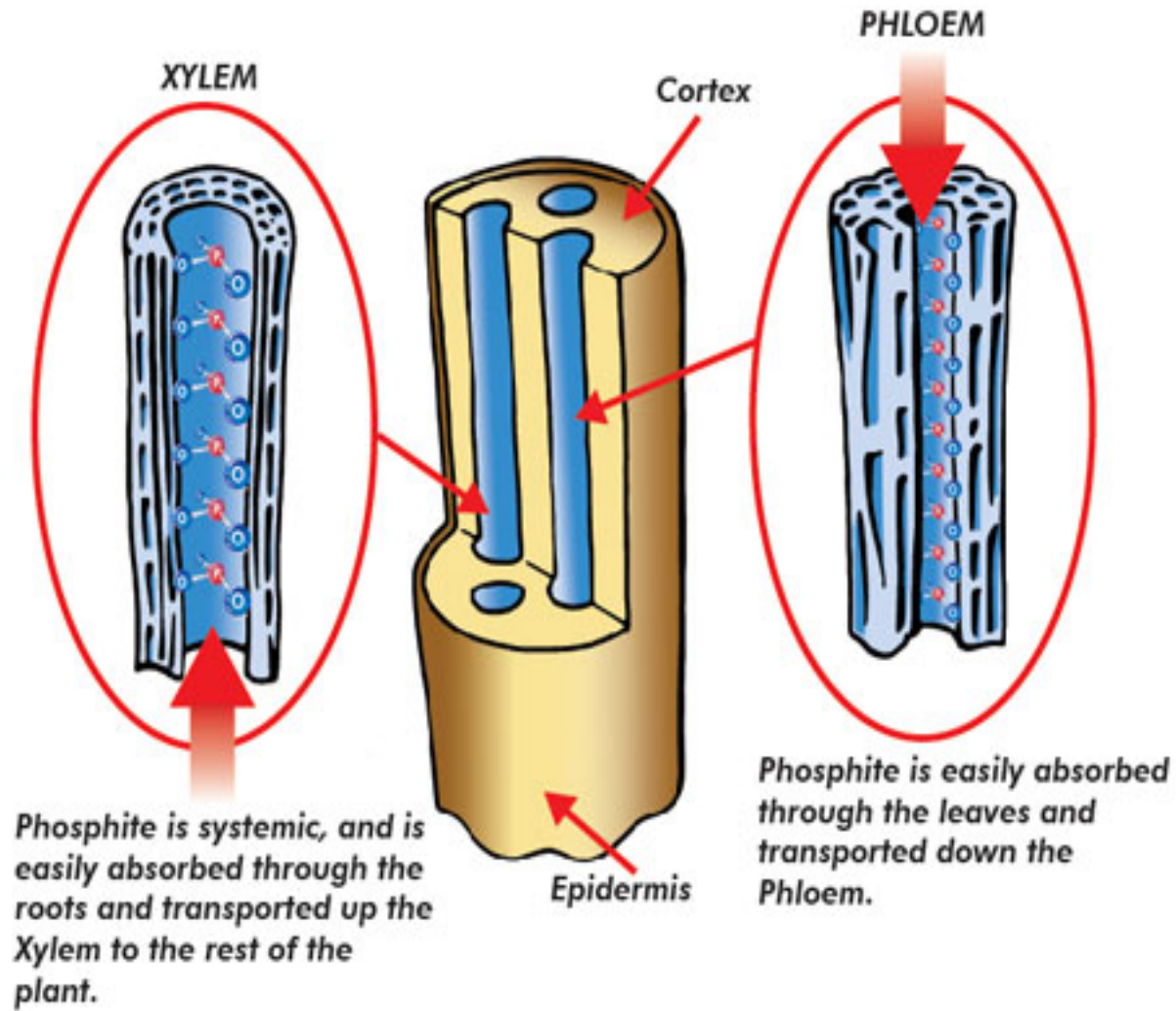




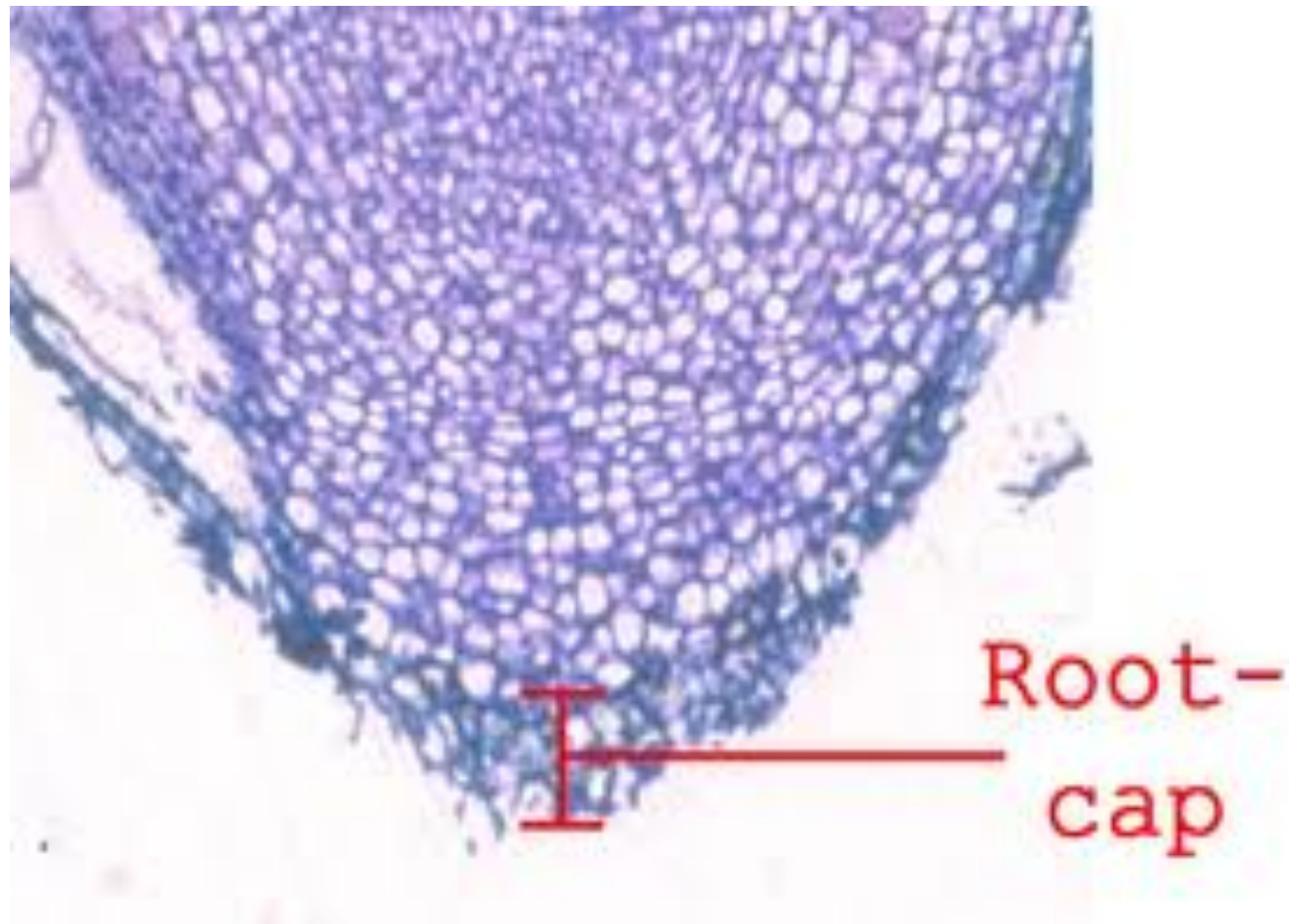
Vine



Food Flow



Root Growing Point





Photosynthesis

- *The process which enables plants to produce their own food*
- Energy from sun (light) is transformed into stored chemical energy (sugars, carbs)
- CO₂ (carbon dioxide) + H₂O (water) in the presence of light and chlorophyll >>>> simple sugars or carbohydrates + O₂
- Only during daylight Influenced by :Light-
Temperature- Water status(wind)





CALENDAR OF EVENTS FOR VITICULTURE MANAGEMENT

- WEATHER
- THE VINE
- HARVEST
- VITICULTURE OPERATION
- PEST MANAGEMENT





PRE-HARVEST





Integrated Pest Management





Integrated Pest Management (IPM)

- Prevention
 - Correct plant in correct place
 - Maintain tree & garden health (correct watering, fertilization, pruning, and sanitation; balanced eco-system)
- Minimize and Target Intervention

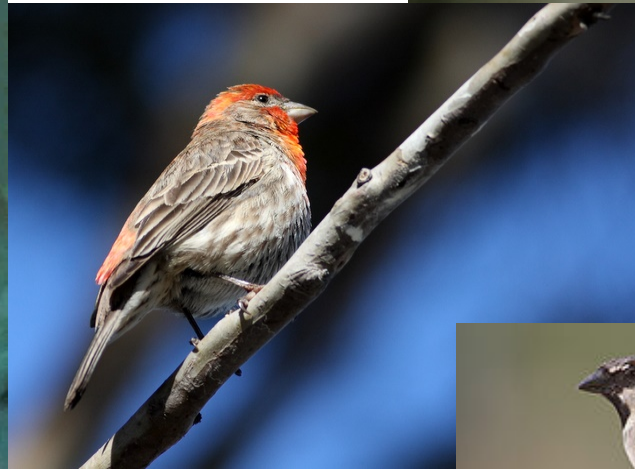


Vertebrate pests



Vertebrate pests

- Birds
 - COVER THE AREA



Vertebrate pests

- Deer Proof the area
Chicken Wire on Ground





Grape Disorders and Invasives



Grape Disorders



Red Blotch



Leafroll



Sharpshooters



Eutypa



Pierce's disease



Invasives



European Grapevine Moth



Grapeleaf Skeltonizer





Irrigation





How Much

Know your microclimate

- Each vineyard can be very different in location (climate), soil-water capacity, vigor and trellis design.

Production Goals

- Variety and wine program to which the fruit is destined.





Know your soil

Soil Texture affects water-storage capacity

Textures

Holding Capacity

Irrigation Needs

Sandy

Less

More

Loamy

Clayey

More

Less





How Much

New Vines – First Year

| <u>Soil Type</u> | <u>First Six Weeks</u> | <u>Second Six Weeks</u> | <u>Remainder of Season</u> |
|------------------|------------------------|------------------------------|------------------------------|
| Sandy | 1.5 Gals/per Day | 1.5 Gals/2 nd Day | 1.5 Gals/3 rd Day |
| Loamy | 1 Gal/ per Day | 1 Gal/2 nd Day | 1 Gal/3 rd Day |
| Clayey | .75 Gal/per Day | .75 Gal/2 nd Day | .75 Gal/3 rd Day |





How Much

New Vines – Second Year

| <u>Soil Type</u> | <u>June 1* - Six Weeks</u> | <u>July 15th until October</u> |
|------------------|------------------------------|---|
| Sandy | 1.5 Gals/3 rd Day | 2.5 Gals/5 th Day |
| Loamy | 1 Gal/3 rd Day | 2 Gal/5 th Day |
| Clayey | .75 Gal/3 rd Day | 1.5 Gal/5 th Day |

* Start time can vary based on rainfall





When

Scheduling

- When we talked about irrigation for this workshop
 - It depends on:
 - the weather
 - the soil
 - the spacing
 - the rootstock....





When

Veraison to harvest

- Irrigate to maintain canopy, but not encourage growth
- Too much water can deprive roots of oxygen
- Encourages bunch rot give a vegetate flavor to the fruit from too much canopy





When

Excessive shoot growth recognized by-

- Large leaves
- Long internodes
- Excessive lateral shoot growth
- Don't Stress vines –Shriveling and yield reduction
- Consider watering to “hang” the fruit until ripe





VISIT EXPERIMENTAL VINEYARD





RETURN AFTER LUNCH QUICK REVIEW Q&A





Canopy Management





Canopy Management

It is all about Balance

Shape, Orientation, Location of shoots
and Leaves



Canopy Management

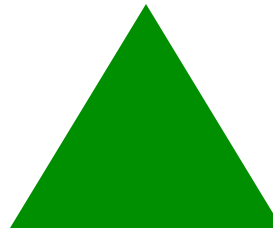
What Affects Balance



Vegetative Growth



Fruit Production



Canopy Management

General Crop Load Indices

- ❑ 8 Leaves per cluster
- ❑ 10 – 14 cm² leaf area – gram fruit weight





Canopy Management

Know your microclimate, Orientation to the afternoon sun

- When to Start
 - ✓ Just Prior To or at bloom
 - ✓ Increase light on the bloom

- During rapid shoot growth
 - ✓ Suckers
 - ✓ Water spouts
 - ✓ May need additional leaf pulling

- When to stop
 - ✓ Start of Veraison
 - ✓ Prior to Harvest





Crop Thinning





Over cropping

- *Over cropping = having too much fruit on the vine to ripen*
- *Balance of the canopy to the fruit enough canopy for photosynthesis to ripen the fruit*
- *Too much vegetation can result in undesirable flavors in the wine.*





Crop Levels and Thinning

BUNCH THINNING

- In August after veraison (coloring) is about 75% take off any bunches that remain primarily green





Crop Levels and Thinning





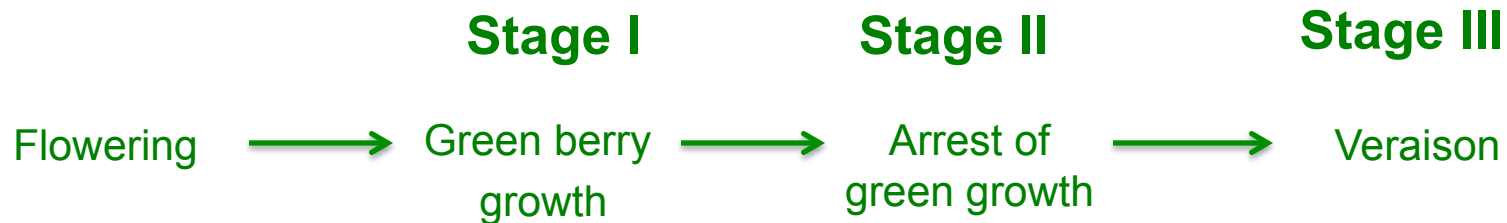
HARVEST



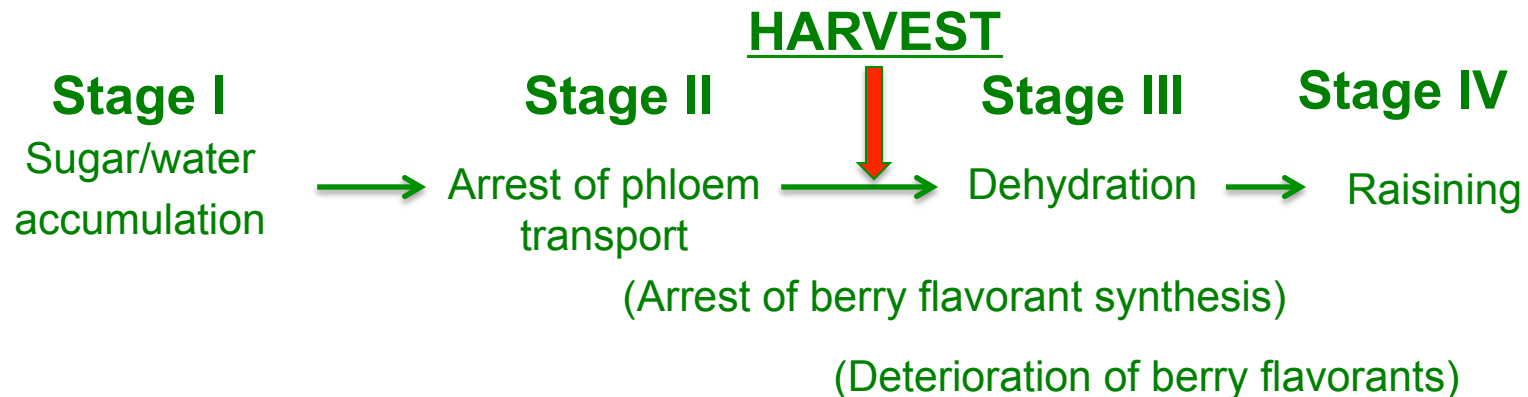


Berry Development

Stages of berry development



Stages of veraison



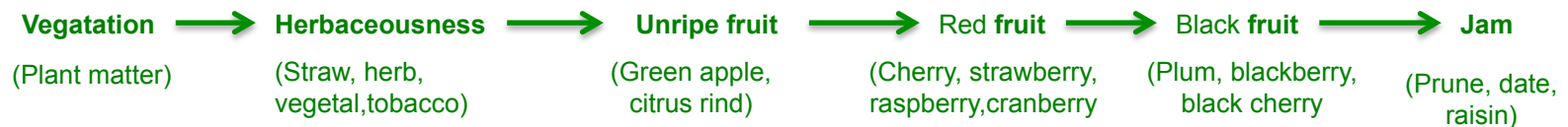


Berry Ripening Characteristics

- Sugar Levels – Brix
- Acidity (TA)
- pH
- Specific Flavorants

TA decreases as pH increases

How does it taste



Evolution of flavorants in Cabernet Sauvignon

Discuss goals with your winemaker





Brix Testing

- When
 - At visual signs of veraison
 - Weekly, Mornings at the same time
- Sample Size (Berries)
 - 150 – 250+/Acre per harvest/variatal block
- Collection Method
 - Zip-seal “baggy”
 - Select most berries from bottom of clusters (back and front)
 - Shaded clusters and sunny sides of rows
 - Every 5/10 vines
 - Leave berries whole, keep cool





Brix and pH Testing

- Process sample
 - Crush berries
 - Knead the grapes
- Assess berry seeds
 - Bright green changes to light brown
- Refractometer exercise
- Maintain records
 - Growing notes





Brix and pH Ranges

| | Brix | pH |
|--------------|---------------|-----------|
| Red Grapes | 23% - 25% | 3.3 – 3.5 |
| White Grapes | 22.5% - 24.5% | 3.1 – 3.3 |

Discuss goals with your winemaker



Harvest Tools





POST HARVEST





Irrigation

Post Harvest

- Irrigate to maintain the foliage for carbohydrate accumulation during the fall.
- 4-8 hours. Drip irrigation
- DO NOT water when the plants are dormant





Erosion and Sediment Control

Purpose

- Reduce and slow down runoff
- Stabilize hillsides
- Protect riparian sites and water quality

Napa County

- Erosion control plan >5% grade
- Review county requirements

Methods

- Straw
- Waddles
- Sediment curtains
- Cover crops
- Mulch





Compost and Mulch



MULCHING





Compost and Mulch

Mulch is not tilled in

- Erosion control
- Moisture content improved





Compost

Compost is tilled in to

- improve porosity
- add microorganism diversity
- slow release of nutrients
- apply 3-4 tons /acre





Cover Crops

Purpose

- Erosion Control
- Soil health, provides nutrition
- Aeration
- Weed Management

TYPES

- Resident vegetation “weeds”
- Reseeding Winter Annuals
- Perennials
- High Biomass Mixes





BEFORE YOU PLANT YOUR VINEYARD





Site Evaluation

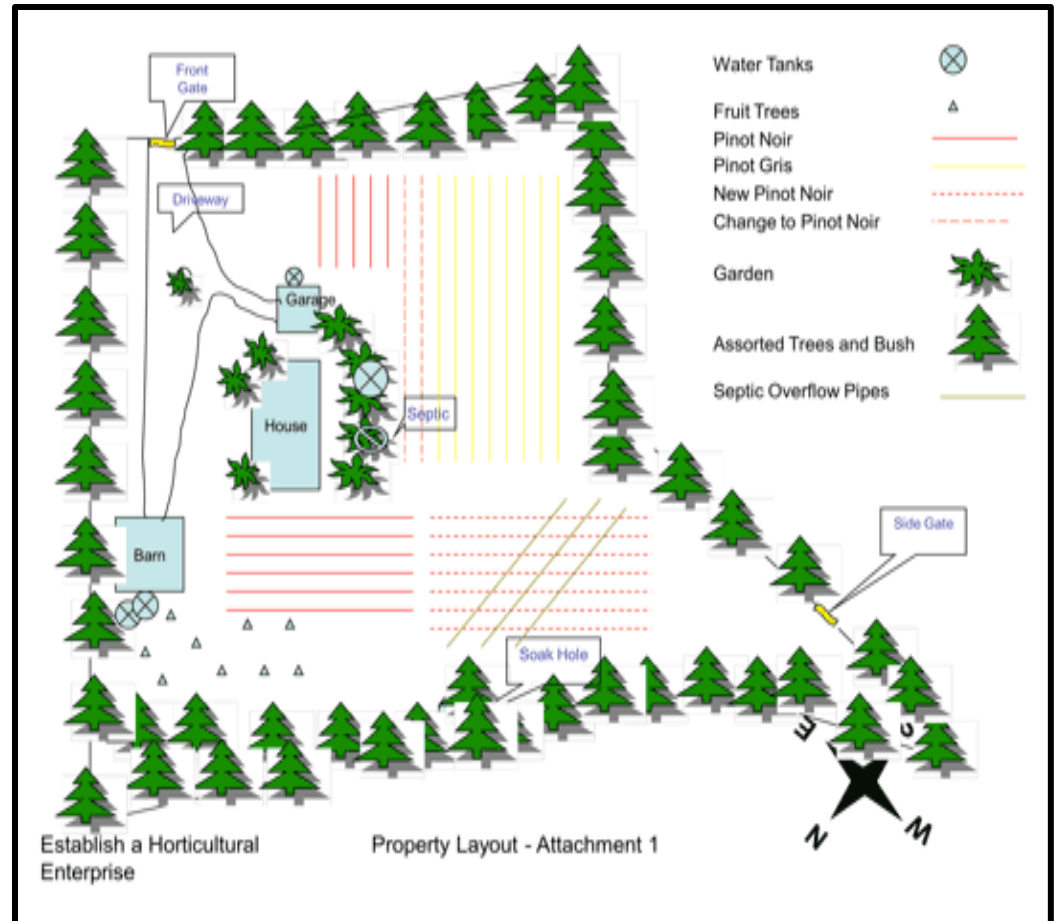
- ✓ Site Size – *estimate your production*
- ✓ Sun Exposure – *the key to getting maximum flavor*
- ✓ Water Accessibility & Availability – *hand watering vs. drip*
- ✓ Soil Drainage – *grapevines do not like wet feet*
- ✓ Air Drainage – *necessary to avoid frost*
- ✓ Wind – *moderate is key*
- ✓ Aspect – *orientation of a slope*
- ✓ Microclimates – *warmer or cooler areas within your site*
- ✓ Soil Test – *fertile soil isn't always the best*
- ✓ Water Test – *know what's in your well*





Determine Layout and How Many Grapevines Can be Planted

- ✓ Vineyard Layout – *survey your site noting primary benchmarks*
- ✓ Row Orientation – *south or southwest facing is best*
- ✓ Row & Plant Spacing – *tighter may be better*
- ✓ Row Length – *don't get boxed in*
- ✓ Scale Drawing
- ✓ Vineyard Production





Identify, Understand and Quantify the Costs to Plant Your Vineyard

- ✓ Site Evaluation – *soil & water tests*
- ✓ Permits – *required if planting 5% slope/
½ Acre*
- ✓ Site Preparation
 - ✓ *Labor*
 - ✓ *Equipment rental*
 - ✓ *Fertilizer & amendments*
 - ✓ *Trellising*
 - ✓ *Irrigation*
 - ✓ *Pest control*
- ✓ Tools & Equipment
- ✓ Planting – *bench grafts or green potted*





Grapevine Varietal, Clone & Rootstock Selection

- ✓ Varietal – *warm or cool climate*
- ✓ Clone – *consider planting more than one*
- ✓ Rootstock – *may need more than one*
- ✓ Ordering – *do it as early as possible and include extra vines – you'll need them later*





Identify, Understand and Quantify the Time Commitment Required

- ✓ Site Evaluation – *occurs in winter or spring prior to when you want to plant*
- ✓ Site Preparation – *occurs in the fall*
- ✓ Pre-Planting – *occurs in late winter to early spring*
- ✓ Planting – *occurs in spring to early summer*





Post Planting





Closing Q&A





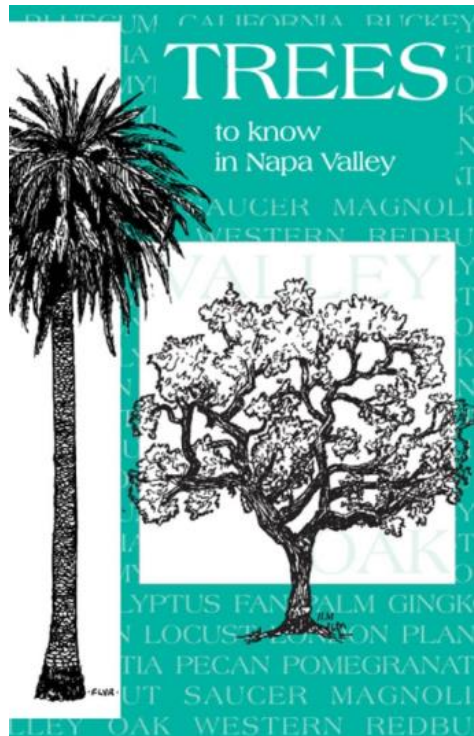
SMALL HOME VINEYARD WORKSHOP

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