

Grape Field Day-UF/IFAS- July 16, 2019

" Current Trends in Vine Canopy Management"

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Vine canopy

- The canopy is the shoot system of the vine. It includes the stem, the leaves, and fruit clusters. It may be described in terms of length, width, or height from base (not ground surface) to top.
- Other measures are leaf area, number of leaf layers, and shoot density. The latter refers to the number of shoots per unit length of row or canopy. For double curtain rows the volume will be double that of single curtain rows.

The purpose of canopy care is to make and maintain a balanced vine.

- Firstly, a balance between the root system, which provides the plant with water and nourishment, and the foliage above the ground that catches energy from the sunlight-**yearly correction with dormant pruning.**
- Secondly, a balance between the vine's natural inclination to expand its vegetation – shoots and leaves – and its need to engage in reproduction, i.e. to produce fruit- **seasonal correction with summer shoot thinning and leaf removal**

Site Selection: Good air drainage is essential for (frost) disease avoidance.

- Sites with a slope are excellent locations. Moderate to low fertility well-drained soils having no perched water table are required.
- pH should be above 5.0 everywhere in the soil profile.
- East to south facing slopes are the best in the northern hemisphere, but other slopes with good aspect are acceptable at this latitude .
- The area surrounding the vineyard should be clear of all trees and brush.

The steep slope, soil composition and influence of the nearby Mosel river are unique aspects of the *terroir* of this German wine region.



Florida vineyard

***Grapevine in the vineyard is the three-dimensional structure.**



Formed and maintained by: Training/Trellis System and Canopy Management

Training is the design and development of a grapevine framework.

- A trellis is the structure that supports the framework.
- Pruning is removing of a portion of the annual vegetative growth to maintain a desired number and spacing of nodes per vine targeting premium yield and quality of grape. It is done during dormancy and during vegetation.
- Training is strategic and pruning is tactical for achieving a particular vine canopy arrangement.

Planting Density

- Rows should be straight, evenly spaced and oriented across the slope.
- Row size 10 to 12 feet apart or at least 2-2-1/2 to 3 feet wider than your tractor. Wide rows waste space, increase vigor, and reduce both quality and yields.
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- For Florida in row spacing should be no wider than :
 - Muscadines - 16 feet apart
 - Hybrids - 8 feet apart
- Plants should be carefully and uniformly planted at the correct depth (1-2 feet).
- Only best quality plants from the best nurseries should be used (until the certified clean plant stock is available).
- Remember that you plant (hopefully) only once and that a planting mistake will plague you for the life of the vineyard.

Trellis Systems

- There is no system that fits all situations
- Many factors will influence your decision
 - Vineyard vigor, variety, rootstock
 - Soil depth, irrigation
 - Spacing, height, materials
 - Mechanization
 - Yield, and quality
 - Costs (budget)
 - Complexity and labor supply

Trellis and Vine Row Direction

- Majority of cool season growing areas arrange rows north-south
- Recent research showing warm season growing areas should put rows 45 degrees east of north-south to reduce sun burn on grapes
- In Florida due to the excess rain: across the slop to minimize soil erosion

Vigor and Growth Habit of the Variety.

- American (native) varieties –genotype???
- Muscadines vs. hybrids???

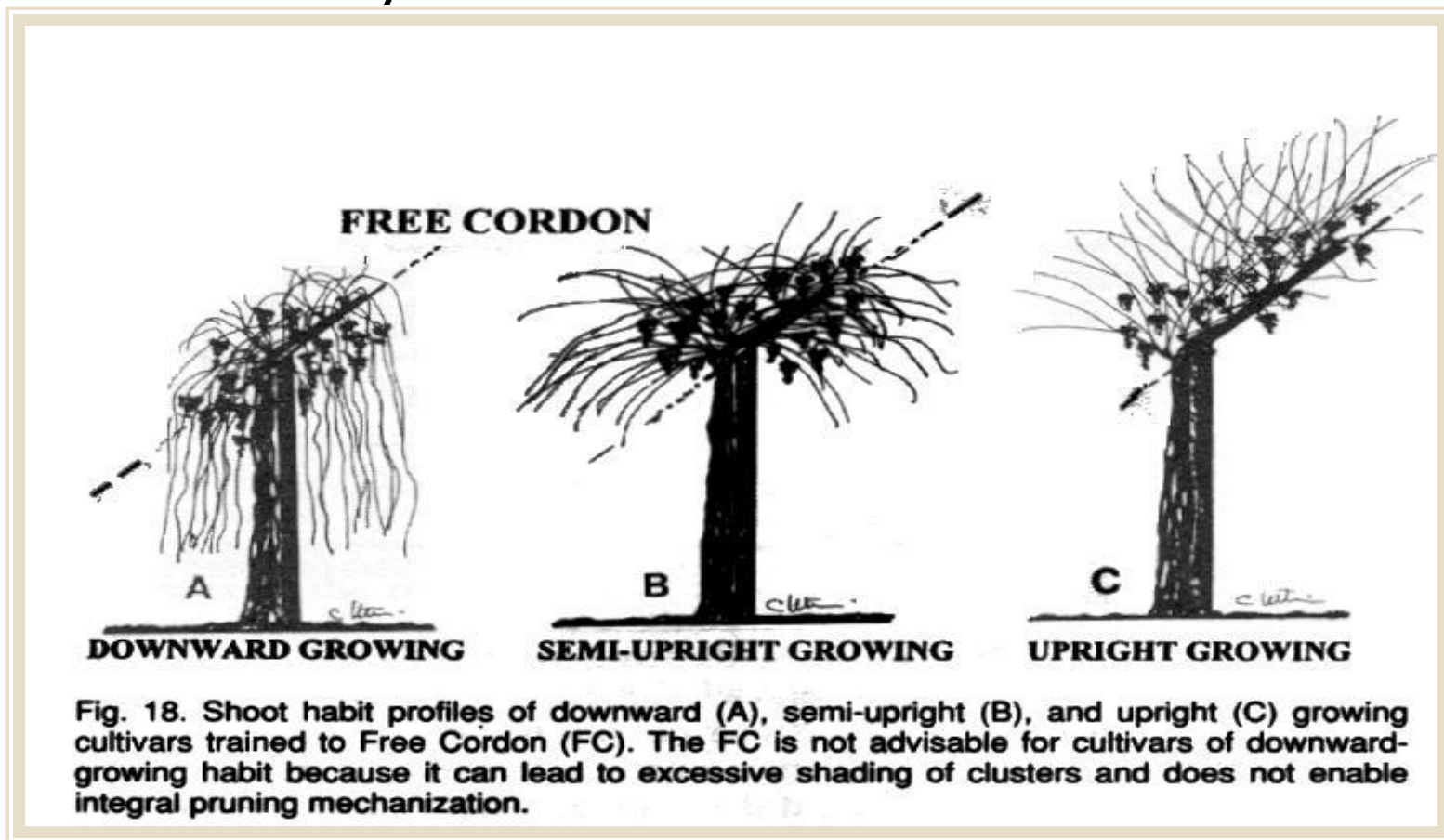
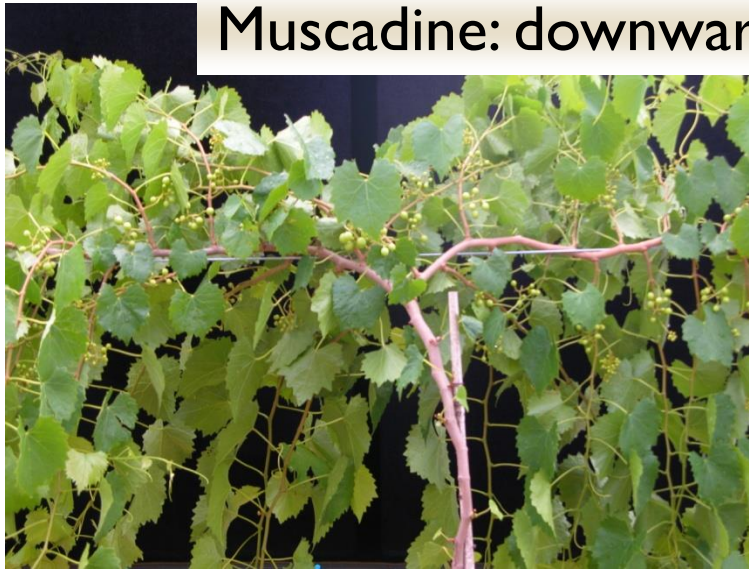


Fig. 18. Shoot habit profiles of downward (A), semi-upright (B), and upright (C) growing cultivars trained to Free Cordon (FC). The FC is not advisable for cultivars of downward-growing habit because it can lead to excessive shading of clusters and does not enable integral pruning mechanization.

Muscadine: downward growing habit-curtain



Blanc du Bois: semi-upright growing



Assessing Vigor (potential vigor)

(Assessed by pruning weight)

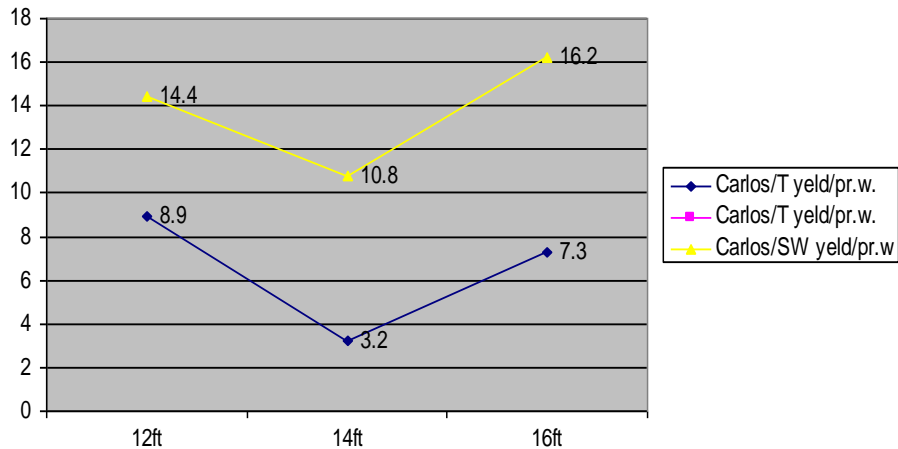
- Medium Vigor: .5-.75lbs/ft
- Low Vigor: <.5 lb/ft
- High Vigor: >.75lbs/ft



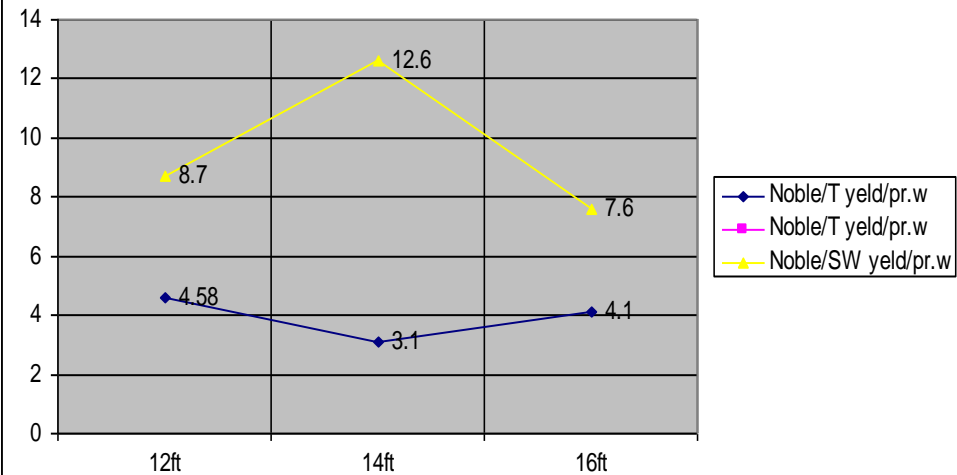
Example:

Vigor;
>12- Low, over cropped
5-10- Moderate
< 3- High, pure fruit set

Impact of Training/Trellis System and Planting Density upon Yield/Pruning Ratio of Carlos var.



Impact of Trainin/Trellis System and Planting Density upon Yield/Pruning Ratio of Noble var.



Single wire system

- One fruit wire/ one foliage wire
- Cordon trained vines
- Low cost, low labor
- Can be mechanically harvested

Training System- Cordon Single or Double

- Will allow you to leave more fruit buds +
- Keep spurs on the upper side of the arm !!!
- Mechanical pruning and harvesting



Fig1. Spring Season in the Foundation Vineyard, May 2014

Initial Training Goals:

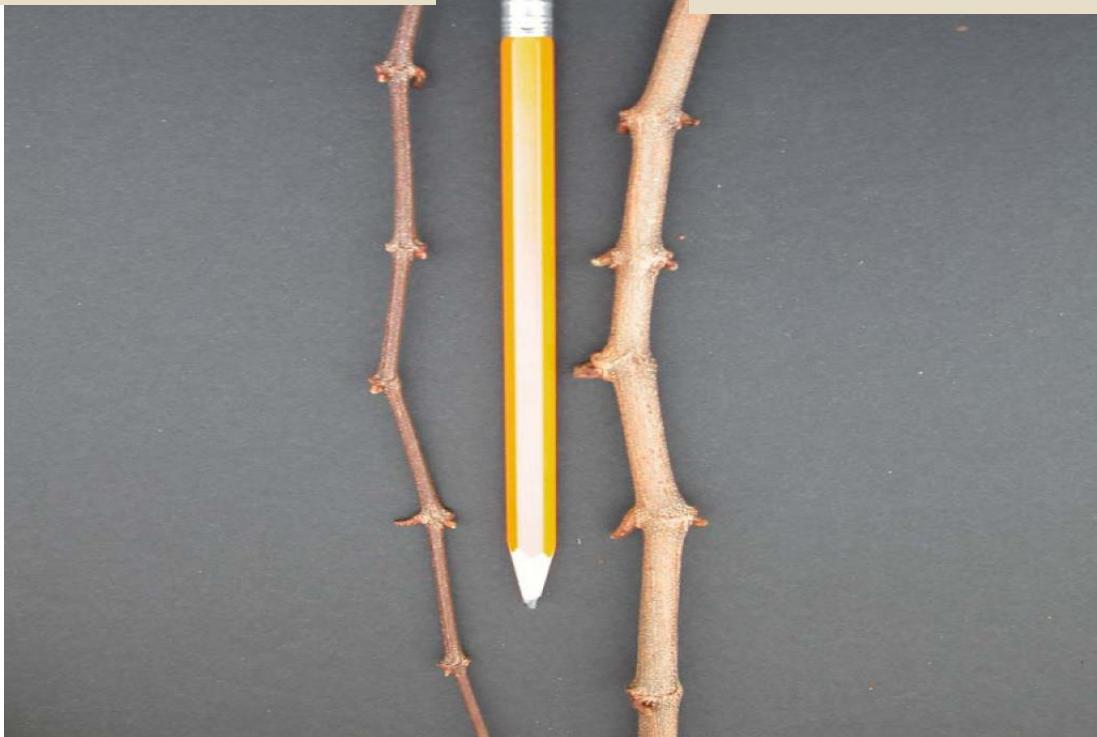
Year 1 – rooting, trunk establishment

Year 2 – straight trunk, strong arms

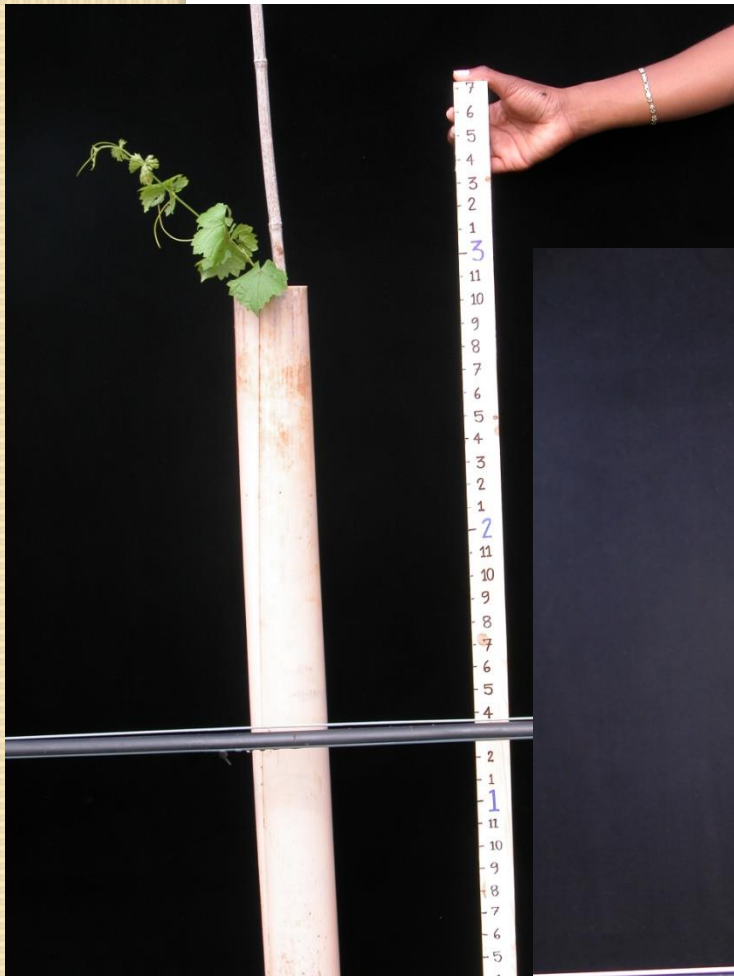
Year 3 – complete the training

Weak 1 year growth

Strong 1 year growth



1st growing season: Severe green pruning.





2nd growing season



Harvest - 2nd growing season



1st growing season



End of 1st growing season

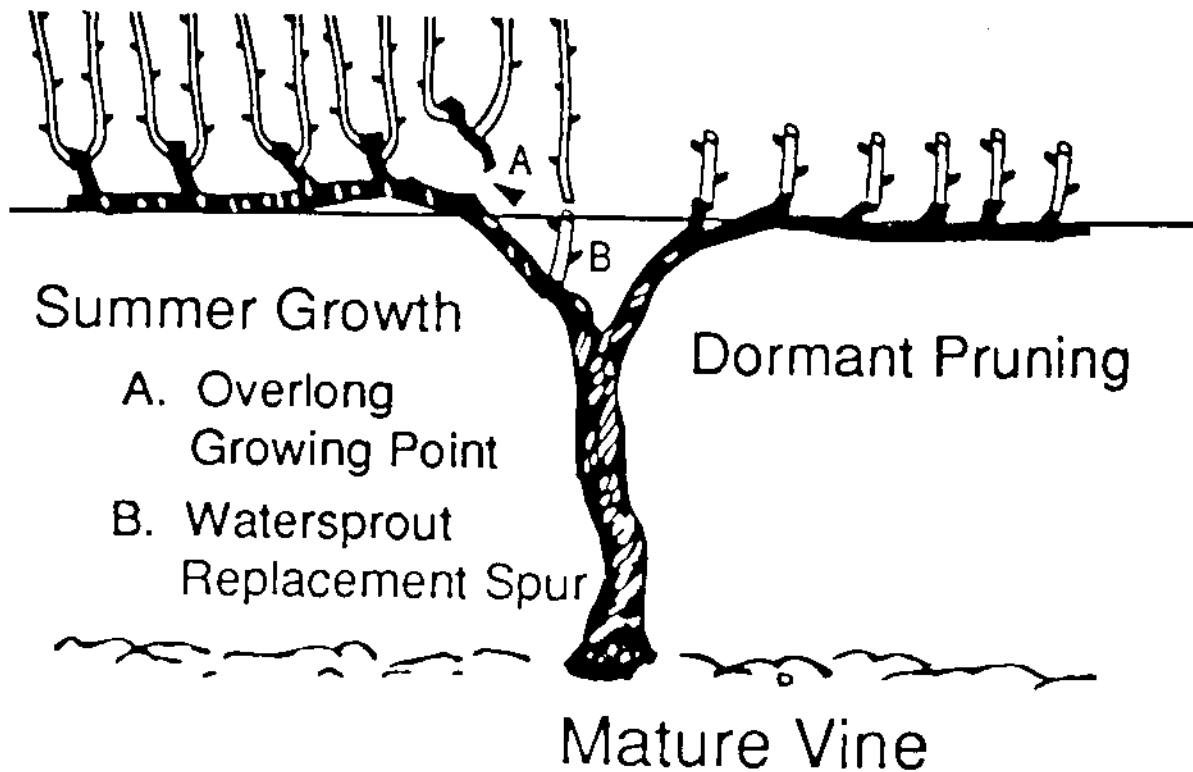


Figure 11-35 Cordon Training



Important: When to prune ???

- Better late than early!!!!
- Bleeding from pruning cuts will not harm the vine!!!
- Wait for at least the first big cold usually at the beginning of January for Florida to be sure the vines are dormant and all the nutrients are securely stored in the rooting system of the plants.

What is wrong with the training of this vine????



Excessive growth at the beginning of the cordon, which need to be corrected with the dormant pruning



Well balanced cordon with healthy growth.



The Ideal Vine Canopy

- When trained to an appropriate trellis system such a canopy will have most of its leaves well exposed to sunlight and provided with good air circulation.
- A well-exposed canopy with adequate leaf area promotes high fruit setting and good fruit ripening.
- Air circulation promotes rapid drying after rain or dews and lower humidity, which helps to resist development of fungal diseases.

The Ideal Vine Canopy

- The optimal canopy is characterized by medium diameter shoots with moderate length internodes and few lateral shoots.
- Shoots should be spaced about 4 inches apart and have about 15 leaves of normal size.
- Preferred shoot length is usually considered to be about 4-5 feet.

Example: Carlos var.



Equipment:

Felco 19 one hand pruner
with spray device

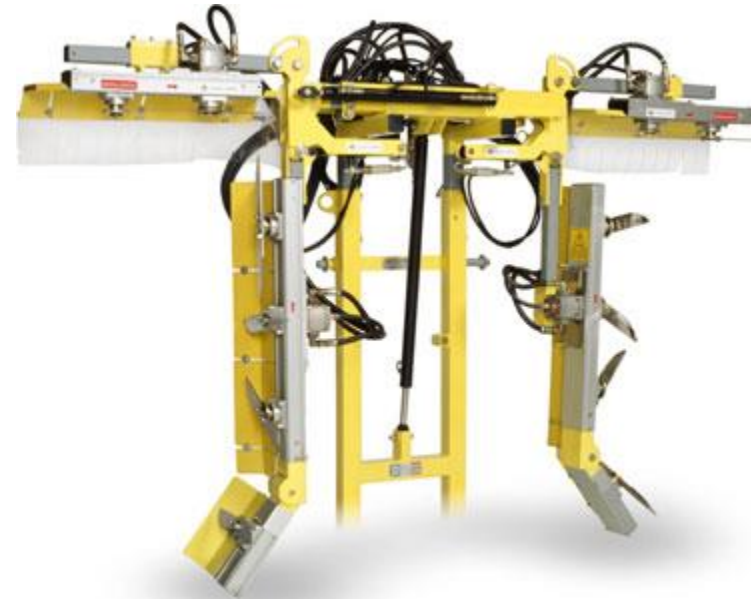


Pneumatic Pruning Shears

SuperStar 2

high cutting speed and more power
Ice Free Valve system
cuts up to 31mm = 1 1/4"
weighs 590g
can adapt to an extension pole

**ROTARY TRIMMER WITH
MODULAR CONFIGURATIONS**
Collard, New Zealand by Bubco.



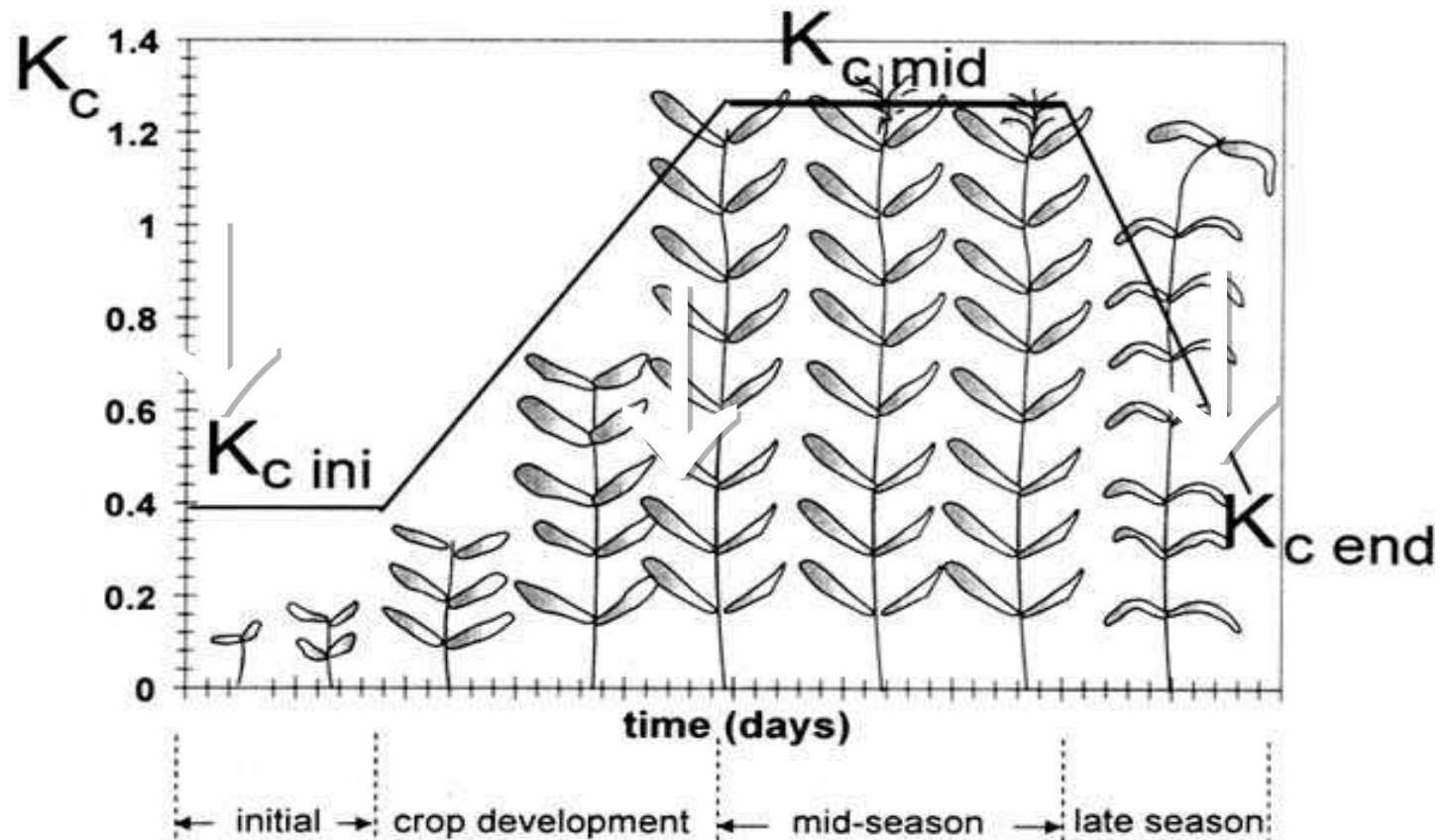
Two practices during the season that control canopy care: nutrition management and vine training.

- Nutrition affects all processes and events in the vineyard.
- Nutrients have to be provided to meet the needs of the cultivated vegetation, but injudicious supply may have negative effects.
- The blend of the major fertiliser components, nitrogen (N), phosphorous (P), and potassium (K), which may have started off at 10-10-10 (N-P-K), needs to be adjusted to meet shifting requirements of the vines, as they grow older.

At least 3 fertilizer application for the growing season and 1 after harvest.

Quantities to be calculated based on your soil and leaf tissue analysis.

Crop coefficient development (K_c)



Nutrition Tips

- The proportion of K needs to be reduced to prevent formation of grape juice with high pH that could result in hard to manage, unstable wine.
- Boron (B) and zinc (Zn) are very important for good fruit set and quality. The nitrogen requirement needs special attention
- Excessive supply of N stimulates high vegetative vigor.

When is Water Needed by Vine

- Budbreak to bloom < 5%
 - Bloom to fruit set 15%
 - Fruit set to veraison 60%
 - Veraison to harvest 20%
 - Harvest to leaf fall < 5%
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- How much water do grapes need?

Compensatory, depends on the rainfall

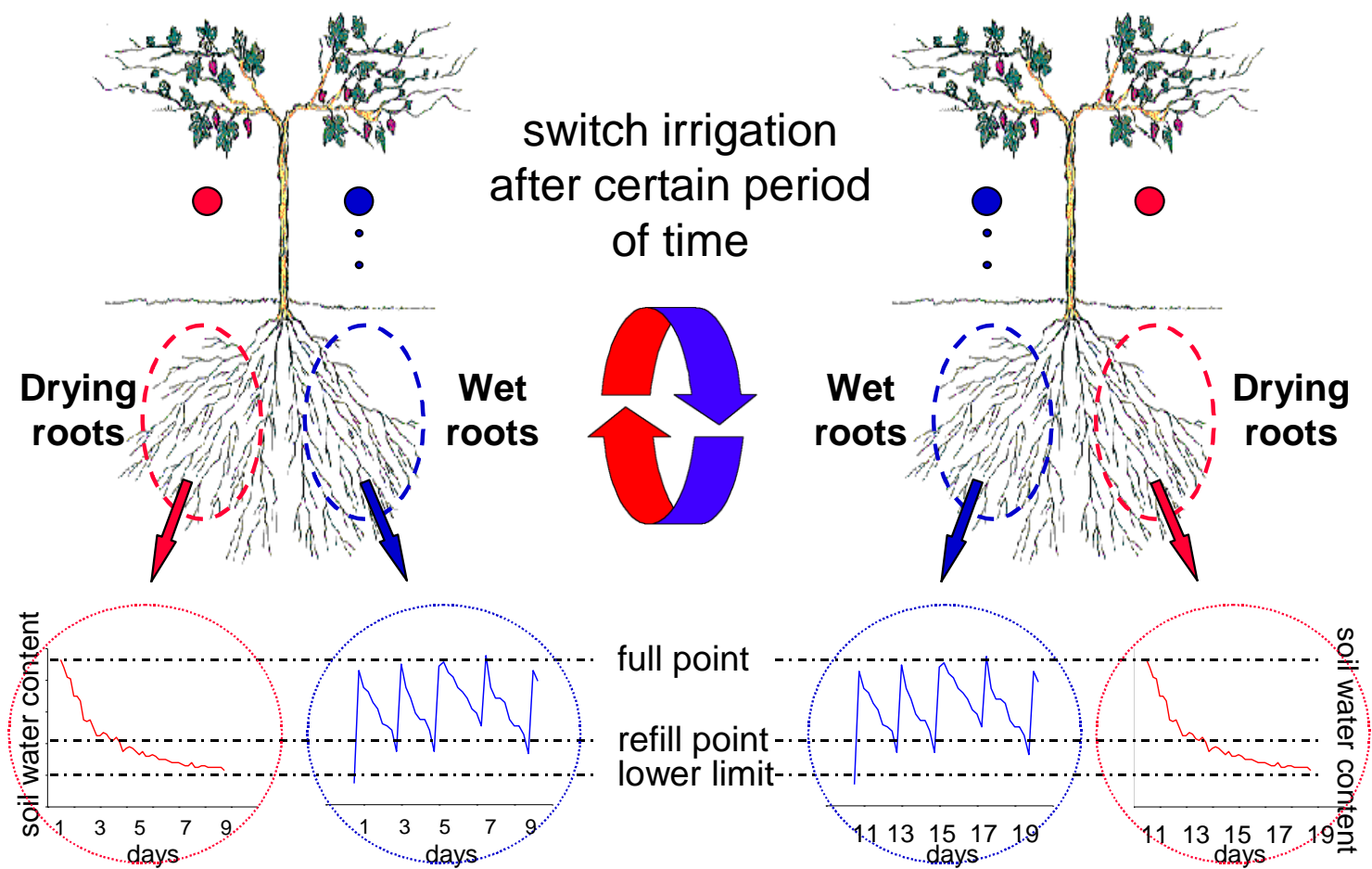
Water Stress Index



Regulated Deficit Irrigation

- Regulated deficit irrigation: cutting water at specific times (10-50% of ET)
- Restrict early growth to improve quality
- Soil water deficit over time
- Applied after fruit set
- Depends on rainfall pattern

Implementation of partial rootzone drying (PRD) with two drip lines



Irrigation can controlled the nutrition

- As the nutrients in the soil are made available in the form of water solutions, excessive vegetation can be curbed by restricting irrigation to a minimum and applied gently.

Summer Vine Training

- **Leaf Pulling.** Leaf pulling is applied only to the shaded side of the vine curtain and then after fruit set. Its purpose is partly to improve air movement and spray penetration, partly to provide sunlight exposure of fruit and basal buds and enrich the color of red wines. Except for old and yellow leaves, no leaves should be removed at or after veraison to prevent sunburn of the fruit.
- **Shoot Hedging and Skirting.** Both operations involve cutting shoots that grow beyond their allocated space or desired length. Hedging refers to topping off upward growing shoots, and skirting to snipping off downward growing ones. The fruit zone may be exposed after hedging.



'Stover' var. after summer leaf removal and hedging

Underestimating Labor

Syndrome :“Vineyard love story” . People in most cases underestimate the labor required for growing premium wine grapes. Most of the work is not done mechanically and much of it is semi-skilled requiring some knowledge and previous experience of grape growing. So much of it will have to be done by YOU if you want it done right, because there is no ready labor pool at least in our neighborhood. The first year is easy. People generally underestimate labor for 2nd year vine training, weed control and mid-season shoot positioning.. If you are behind schedule you usually will stay behind and if you can't make it to effectively spray then you can lose your crop.

Underestimating Cost

Viticulture has been referred to as “upscale boutique farming.” Establishment costs for vinifera can run more than \$10,000 per acre if you have to hire the labor. Hybrids cost less but likely will run \$5,000 or more if the labor is hired. This of course doesn't include land, buildings or equipment. Yes, you can reduce the cost somewhat by doing the work yourself, but don't underestimate the challenges of grape growing.

Over reliance on “experts”.

How many times have we heard “But “X” told me to plant “Z”.

Yes “Z” is a disease resistant, but brings almost no market value. What a deal! !!!

There is an incredible amount of “good” advice. Respectable references exist, attend conferences, workshops and educate yourself.

Travel is expensive? How much does failure cost?

Make your own informed critical decisions!!!

It is your business!!!

Philosophical Disparity : “To be or not to be...”

This is more important than it may sound. If you are interested in quick returns or have an “annual crop” mentality, grape growing may not be in your best interest.

Financial returns, planning and satisfaction are all long term.

As with any pursuit, it helps immensely if you have a passion for growing grapes and perhaps making and consuming fine wine. Passion will drive you over and through the inevitable rough patches.

Yes, you can do this just for the money, but you probably won't be satisfied with the results.

There's an old joke about vineyards:

Question: You know how to make a small fortune with a vineyard?

Answer: Start with a large fortune!



**DREAMERS BECOME FRUSTRATED, KNOWLEDGEABLE DREAMERS
BECOME VINEYARD OWNERS!**