Pruning for Vine Balance

From the writings of

Paul Verdegaal

Plus the experience and teaching of

Craig Macmillan

VINEYARD TEAM

Promoting Sustainable Winegrowing

Craig D. Macmillan, Ph.D., Technical Program Manager

Winter Practices **Tailgate Meeting, J. Lohr Vineyard & Wines, January 12, 2016**

What is Vine Balance?

What are We Balancing?

What is Vine Balance?

What are We Balancing?

Vegetative Growth to Reproductive Growth

What is Vine Balance?

What are We Balancing?

Vegetative Growth to Reproductive Growth

…or are we really balancing…

What is Vine Balance?

What are We Balancing?

Vegetative Growth to Reproductive Growth

…or are we really balancing…

Tonnage to Wine Quality

What is Vine Balance?

What are We Balancing?

Vegetative Growth to Reproductive Growth

…or are we really balancing…

Tonnage to Wine Quality

…which is really…

What is Vine Balance?

What are We Balancing?

Vegetative Growth to Reproductive Growth

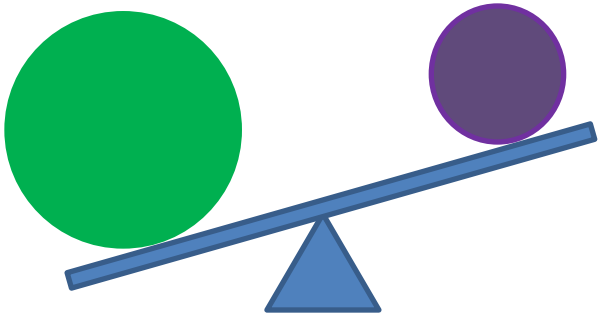
…or are we really balancing…

Tonnage to Wine Quality

…which is really…

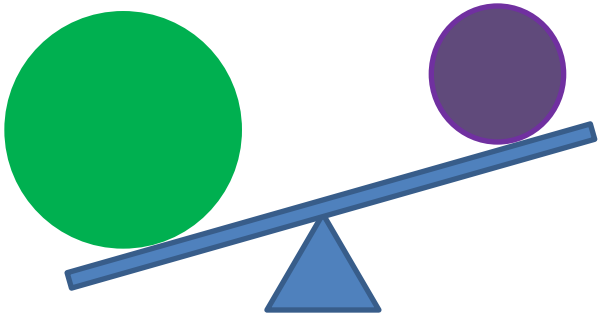
Grower Revenue to Winery Revenue

Finding a Balance

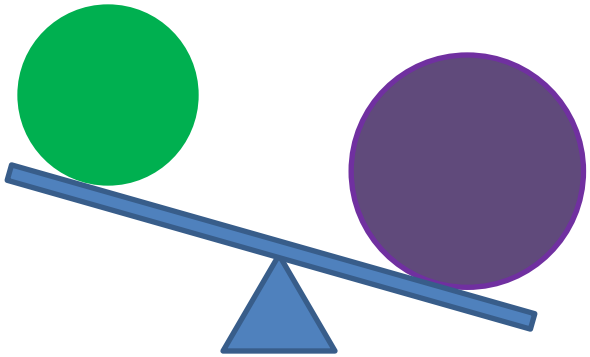


Green is fruit and canopy; Purple is wine quality
Over cropped or over vigorous vines lead to poor wine quality.

Finding a Balance

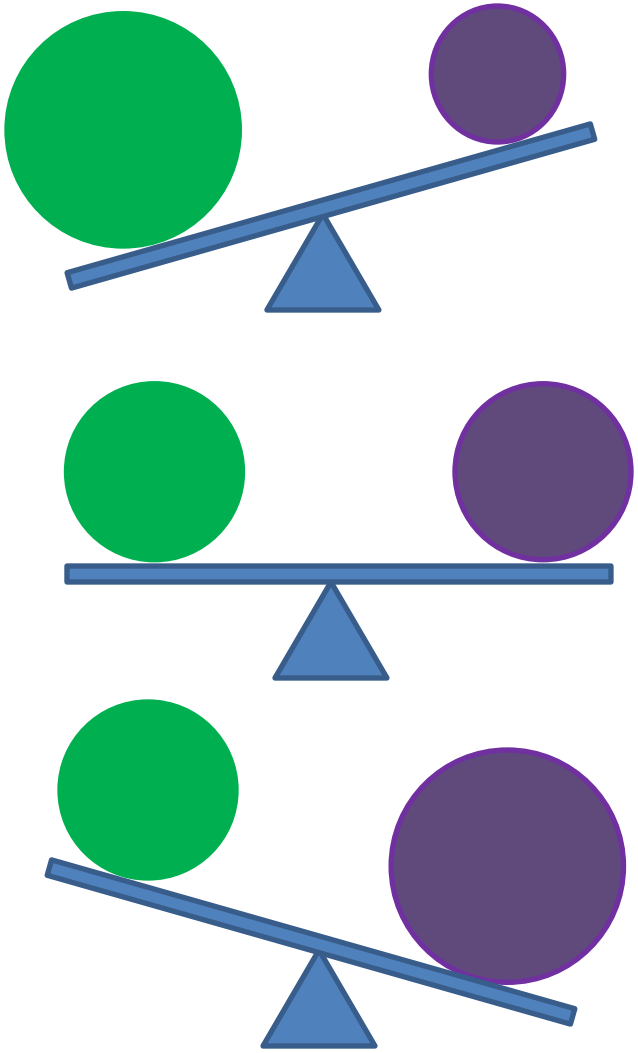


Some belief that less fruit and less canopy lead to better wine quality.
This is true to a point, but it is hard for the grower to make a profit when yields are too low.



The Sweet Spot

The goal is balance. Balanced vines produce an economically viable quantity of fruit and high quality wines.



Evolutionary Strategies of *Vitis Vinifera*

Primary goal: Survival

- **Individual organism**
- **Genes of species**

- **Increase storage capacity (Woody tissue)**
- **Physically colonize space (Shoots)**
- **Spatial dispersal of genes (Fruit)**

Vine Self-Regulation

Vine self-regulates to achieve the most advantageous outcome.

- ***Storing Resources***
- ***Capturing Resources***

Signs of Self-Regulation: Resources Plentiful

- **Long shoots**
- **Large leaves**
- **Laterals**
- **Explosive growth after green pruning**
- **Large berries/clusters**
- **Second crop**
- **Buds pushing mid-season**

Signs of Self-Regulation: Resources Scarce

- **Short shoots**
- **Small leaves**
- **Struggles after green pruning**
- **Small berries/clusters**
- **Downward spiral**

Pruning and Vine Balance

“Most of this is fairly common sense and has been learned by all grape growers at one time in their life. The reason it’s worth mentioning is that sometimes basic principles go by the wayside during particularly good times or especially bad times.”

From:
“Pruning and Vine Balance”
by Paul Verdegaal, San Joaquin County Farm Advisor
In *LWWC Research/IPM Program Update*, December 2003

How is Vine Balance Achieved?

- **Trellising**
- **Training**
- **Dormant Pruning**
- **Canopy Management?**
- **Green Pruning?**

Pruning versus Sanitation

- **Pruning is removing living tissue to affect physiology.**

- **Dead (or diseased) tissue removal is sanitation.**

Capacity and Vigor

- ***Capacity*** **is the total possible growth and production of the vine during the growing season.**
- ***Vigor*** **is the rate of growth.**
- **What we call "vigorous" is the overproduction of shoots and leaves in relation to crop load.**

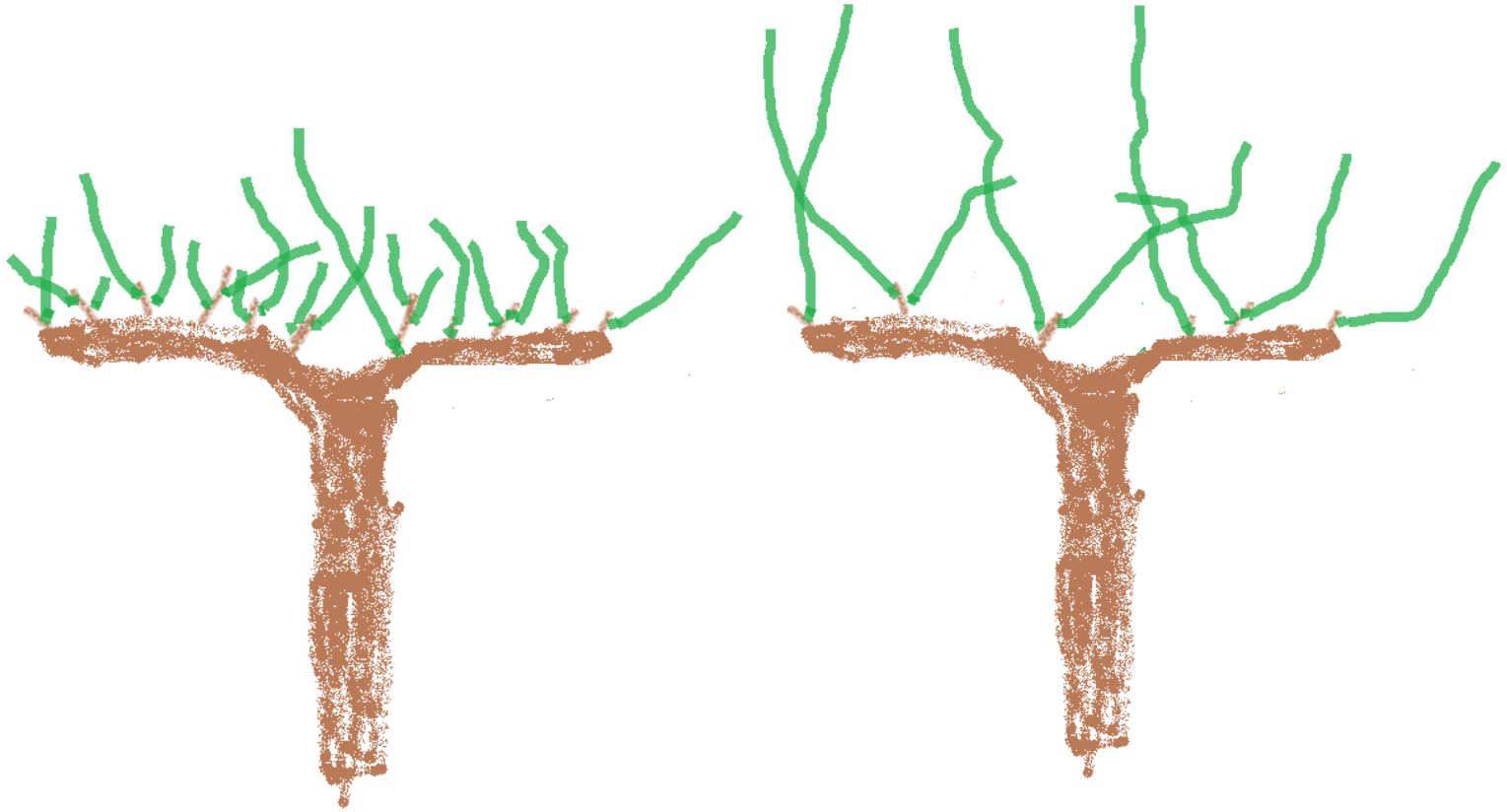
Capacity and Vigor

- **In-season assessment**
  - **Shoot growth rate**
  - **Shoot length**
  - **Percent active shoot tips at veraison**

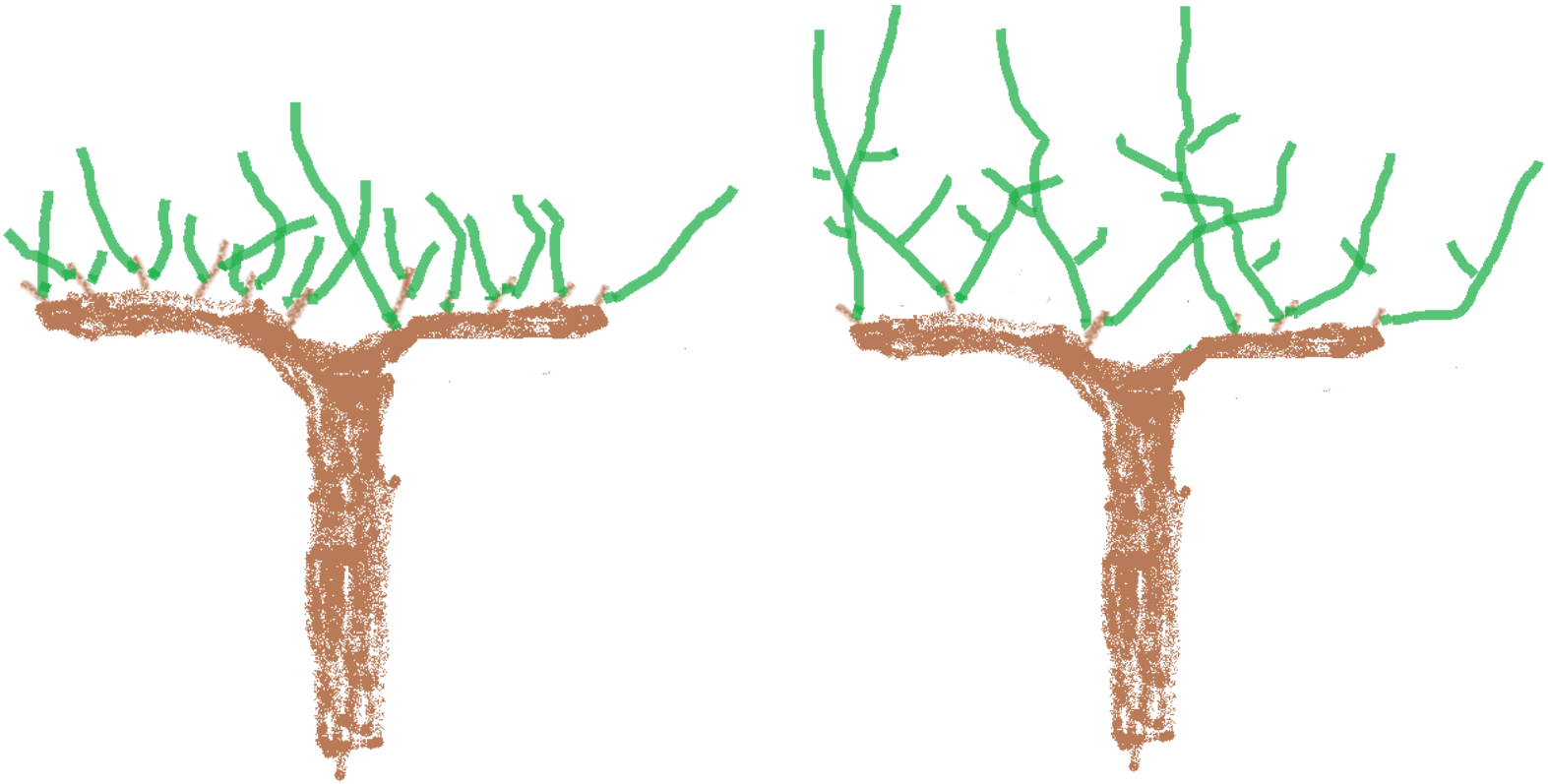
Capacity and Vigor

Capacity and Vigor

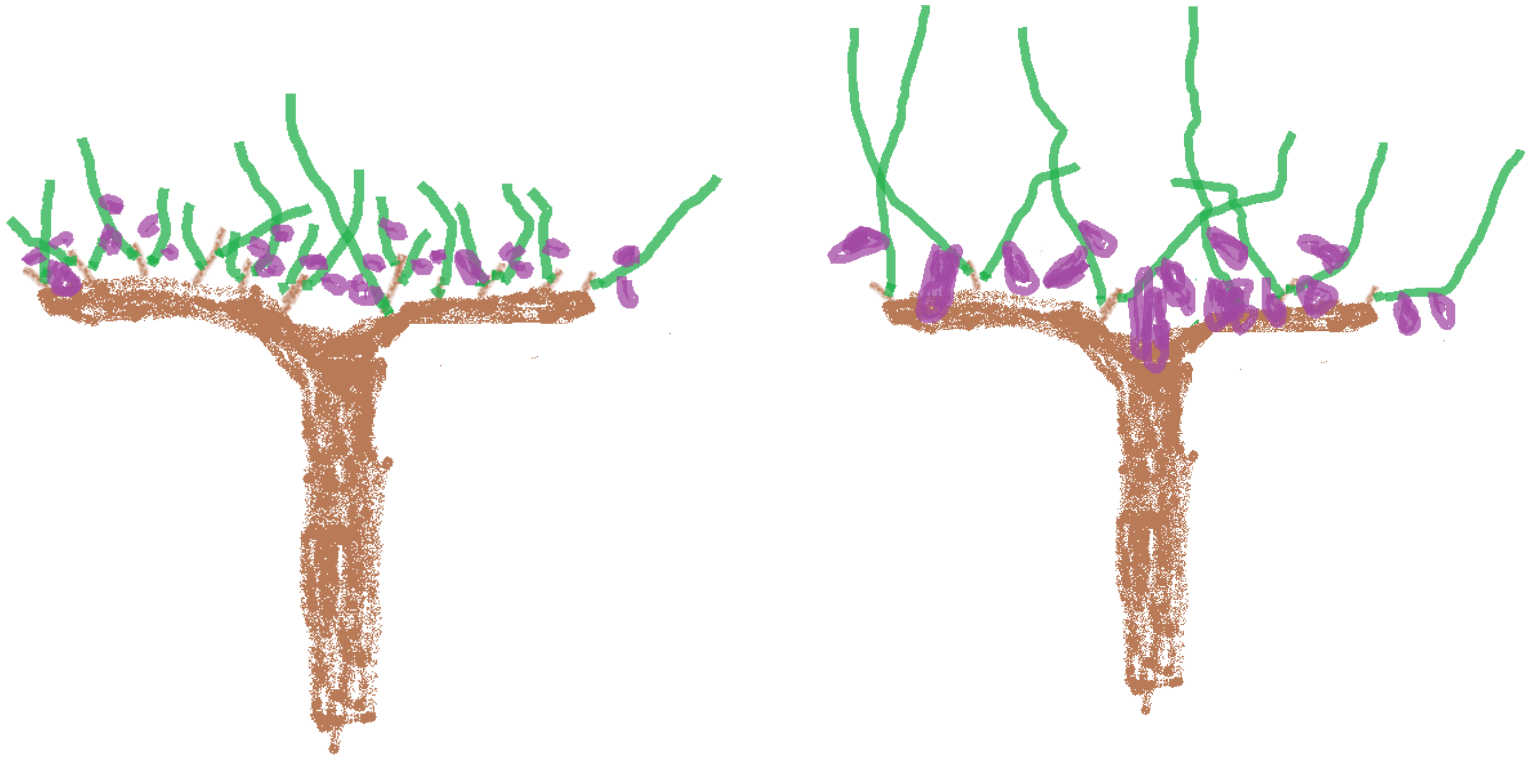
Capacity and Vigor



Capacity and Vigor



Capacity and Vigor



Capacity and Vigor

Capacity and Vigor

“If a vine is in balance, it has just enough shoot growth to produce the crop level the grower needs, while providing the quality the winemaker wants.

A very general guideline would be about 42 inches of shoot, give or take 6 inches.”

From:
“Pruning and Vine Balance”
by Paul Verdegaal, San Joaquin County Farm Advisor
In *LWWC Research/IPM Program Update*, December 2003

Measuring Pruning Ratios

- **Select 3 to 5 representative vines (minimum) in the block**
  - **Weight the prunings**
  - **Calculate average weight of prunings per vine**
  - **Calculate average crop yield per vine**
  - **Divide average crop yield by average pruning weight**

- **Forward looking or backward looking?**

Measuring Pruning Ratios

"From the work done by Dr. Mark Kliewer and others it appears a reasonable ratio of crop yield to pruning weight lies in the range of 5 to 7."

"Some viticulturists believe a ratio of 3 to 5 is even better for assuring the highest quality."

"A ratio less than 3 would most often indicate under cropping, while a ratio greater than 9 would mean severe over-cropping."

From:
"Pruning and Vine Balance"
by Paul Verdegaal, San Joaquin County Farm Advisor
In *LWWC Research/IPM Program Update*, December 2003

Pruning Ratio Calculations

Vine #	Prunings (lbs)
1	2.08
2	2.32
3	2.73
4	3.10
5	2.23
AVERAGE	2.49

Total tons	47
Total acres	11
Tons per Acre	4.27
Lbs. / Acre	8545.45
Vine / Acre	1089
Lbs. / Vine	7.85

Pruning Ratio = 7.85 / 2.49 = 3.15

Using Bud Counts

Decision should be based on Pruning Ratios

- To raise the ratio, leave more buds
- To lower the ratio, leave fewer buds

Where the Steel Meets the Cordon

Actual pruning decisions are hard!

- Three bud spurs, anyone?
- Blind buds
- Current trellis system
- Current training
- Vine variation
- TRUNK DISEASE

Grower-Winery Balance

- **Requires true experimentation**
- **Statistically valid design and methods**
- **Reliable measures**
- **Valid evaluation**

Pruning for Vine Balance

From the writings of

Paul Verdegaal

Plus the experience and teaching of

Craig Macmillan

VINEYARD TEAM

Promoting Sustainable Winegrowing

Craig D. Macmillan, Ph.D., Technical Program Manager

Winter Practices **Tailgate Meeting, J. Lohr Vineyard & Wines, January 12, 2016**