The Importance of Balanced Fruit

And What To Do When It Eludes You

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Who am I?

- Winegrower and winemaker for Walsh Family Wine, located in Northern Virginia
  - 50 acres of vinifera on 5 different sites
  - Produce vineyard specific varietal wines and blends, grow fruit by contract for other local wineries
- Since 2004, worked with wineries and vineyards in Central Virginia, Northern Virginia, Willamette Valley, Oregon, and Central Otago, New Zealand
- Worked with both vitis vinifera and hybrids
- Started in wine production, then shifted to winegrowing

The Plan

- Talk about the parameters we use to measure balanced fruit, the ranges we prefer to be in, and decisions we can make to help achieve these goals
  - pH, TA, Brix, cleanliness, and ripeness
- Talk about some of our options when fruit is not within those parameters

What is balanced fruit?

- Balanced fruit has “optimal” chemistry at the same time as “optimal” ripeness

- When we consider the matrix of qualities that we are looking for in fruit for wine production, balanced fruit is in the sweet spot
- Very difficult to achieve this, and very important to try
- Balanced fruit tends to result in the most “harmonious” wines

What is the definition of “optimal”?

- Optimal balance in winegrapes
  - Determined by pH, TA, Brix, cleanliness of fruit, and Ripeness
  - Differs considerably from variety to variety
    - What is ideal for Sauvignon Blanc is not ideal for Petit Verdot
  - Differs based on the intention of the winemaker and grower
    - What is the goal? What is the purpose of the crop?
    - What is ideal for a sparkling Chardonnay is not ideal for a still Chardonnay
  - Is one of the most important winemaking decisions
    - You are ending the ripening process when you pick. This cannot be undone.
  - Is one of the most difficult winemaking decisions
    - It is both objective (pH, TA, Brix) and subjective (Cleanliness, Texture, and Taste).
    - It is also not entirely up to us

Optimal Acidity

- pH and TA
  - What is pH? Why does it matter to a winemaker?
    - Bacterial stability of the wine
    - Perception of vibrancy and roundness
    - Effects the environment for primary and secondary fermentations
    - Effects the environment for efficient unbound sulfur dioxide
  - Whites – pH should be around 3.0 – 3.5
    - Why do we prefer this range?
    - Fruit over or under these numbers is not intrinsically bad, you just need to be aware that adjustments may need to be made as it will effect the final product
  - Reds – pH should be around 3.4 – 3.8
    - Why do we prefer this range? Why is it different from white wines?
  - What is TA? Why does it matter to a winemaker?
    - Measurement of all combined acids in the must/wine
    - Tell us how acidic/tart the wine will be
  - Whites – TA should be around 6.0 – 9.0 (g/l)
  - Reds – TA should be around 5.0 – 7.0 (g/l)

Acidity (continued)

- How do we adjusting (or not adjust) pH and TA in the vineyard
  - Soil composition (potassium uptake into vine) will help dictate fruit pH
    - More potassium uptake into vine = higher pH
  - Sun exposure during ripening
    - Heat during summer nights
      - Warmer nights = more respiration of malic acid, loss of acidity
      - Cooler nights = retention of acidity
  - Variety
    - Large difference in pH and TA in different varieties (and clones within varieties)
      - Consider how your variety will respond to your site
  - Pick Date
    - pH starts low and gets higher every day
    - TA starts high and gets lower everyday
    - The longer the fruit hangs, the more acidity we lose

Optimal Brix

- What does brix tell us?
  - Potential alcohol of the finished wine
    - Important as alcohol gives wine a sense of body and sweetness
    - Low alcohol wines (<10%) tend to result in thin, light, astringent wines
    - High alcohol wines (>14.5%) tend to result in “hot,” flabby wines
- What does brix not tell us?
  - Ripeness of the fruit
  - Brix is *related* to ripeness, but it is misleading to assume that there is a direct correlation. 25 brix does not mean the fruit is ripe. It means the final alcohol will be 15%
- Ranges:
  - Whites: 19 – 24
  - Reds: 21 – 25

Optimal Brix (cont.)

- What can we do to adjust brix in the vineyard?
  - Consider ripening potential during site selection
    - Particularly the plant available water on the site
    - Varietal with regard to your climate (GDDs, heat summation, etc)
  - Annual management of the vineyard:
    - Cropload per vine
      - *All things being equal*, a vine with less fruit will accumulate sugars faster than a vine with more fruit
        - Low yield ≠ high quality
      - When speaking of cropload, consider the differences of tons / acre vs lbs / per vine vs lbs / foot of canopy
        - If determining cropload / vine, what we are interested in is lbs / vine
    - Health and size of canopy
      - Leaves burnt out by downy mildew do not photosynthesize
      - Larger canopies (more leaf space) should gain sugars faster
    - Vegetative growth ideally ends at veraison
      - Allows for longest time for sugar acclimation
    - Pick Date
      - Brix will continue rising after veriason *if the sun is out and it does not rain*

Optimal Cleanliness

Optimal Cleanliness

- Optimal = 100% clean
- Any level of rot/disease on fruit *will* have an impact on the final wine
  - But, there are sub-threshold levels below which good winemaking will handle the issue
- What can you do in the vineyard?
  - Everything

Optimal Ripeness

- What are we talking about when we talk about ripeness?
  - We are not talking about brix, pH, or cleanliness
  - We are talking about *subjective* descriptions of flavors and textures
- Flavor of juice (in white wines)
  - White wine is a product entirely of the juice within the berries, so the qualities of that juice is what is important to us
    - We need to create repeatable and measurable ways to talk about those flavors
    - In picking Sauvignon Blanc, we wait until there is a “hint” of caramel in the berries. As soon as we taste that, we pick.
    - It is not important to me what the juice of my red grapes tastes like (unless we are making rose)
- Skin tannin/texture (in red wines)
  - Red wines ferment with grape skins, and gain much of their textural qualities directly from the skins
    - We have a methodology for describing skin tannin texture, which we quantify numerically and consider to be of equal importance as all other indicators
- Seed tannin (in red wines)
  - Red wines ferment with seeds, and gain tannin from the seeds
    - We want brown / brittle seeds, as they have no “green” or “unripe” tannin to impart on the wine
    - With seeds and stems, in general brown = good, green = bad

Summary of Balance Fruit

- Balanced fruit is fruit that is picked with all of the following at their "optimal"/intended point:
  - Ripeness (flavor and tannin)
  - pH and YA
  - Brix
  - Cleanliness of fruit
- Example:
  - Bethany Ridge Sauvingon Blanc, picked August 31st 2017
    - Ripeness: we began tasting a hint of caramel on August 28th
    - pH in settling tank: 3.15
    - TA in settling tank: 7.2
    - Brix: 22.5
    - Cleanliness of fruit: ~2% bird damage, resulting in some sour rot. Sorted out prior to pressing.

But that’s not the way it always works:

What do we do when fruit is unbalanced?

- Ripeness
  - Scenario: We are growing Norton for a red wine, but due to disease pressure we begin to see botrytis on the fruit. It does not taste ripe but we need to pick to save the crop
    - Keep in mind, ripeness cannot be “added back” to a wine, but there are approaches which can help
  - It is important to know *what* is unripe about the Norton
    - Is it the skin tannins? Do we taste it in the skins?
      - Tannin additions during fermentation
      - Adjust our maceration protocol – if we want to extract less, we should consider fermentation temperature, maceration style, and length of maceration
        - Important to understand *what is happening* during the maceration
      - Blend
    - Is it the seed tannins? Are the seeds green and harsh?
      - Delestage
      - Oak chips and/or powders during fermentation – toasted or untoasted
      - Adjust our maceration protocol – same as above
    - Flavors / density of the must
      - Concentrate additions
      - Blend

What do we do when pH is unbalanced?

- pH
  - Scenario: Our Chardonnay tastes ripe but the pH is getting high
    - Acidulate the must with tartaric acid, aiming for a preferred pH within the white wine range
      - Best done prior to fermentation
    - Post-fermentation additions of tartaric acid give you the ability to do trials, and to fine-tune acidity, but they are more perceptible in the finished wine
  - Scenario: Our Chardonnay tastes ripe but the pH is too low
    - Include contact with the skins prior to pressing to raise pH
      - This will also increase body and astringency
    - Utilize a malic acid degrading yeast
    - Allow the wine to go through malolactic fermentation
    - Look around: you're probably not in Georgia

Brix

- Scenario: Our Merlot pH is ideal, the fruit is clean and tastes ripe, but brix are low
  - Determine a desired brix level, and chaptalize with cane sugar or RCGM
    - Chaptalize during the first third of fermentation – this can't be done after fermentation and will stress the yeast in the later stages of the ferment
    - This will change nutrient needs of fruit – be aware of YAN needs
- Scenario: Our Merlot pH is ideal, the fruit is clean and tastes ripe, but brix are too high
  - Determine desired brix level
    - Water can be added to grape must to decrease final alcohol
      - This will also raise pH and dilute the wine
    - Must can be adjusted using reverse osmosis or spinning cone
      - Don't ask me how either of these work
    - High alcohol tolerant yeasts can be used
      - Be *very aware* of yeast alcohol tolerance when dealing with high brix musts
    - Keep in mind – a high brix must may struggle to complete fermentation, and with this you risk a stuck fermentation. Also, high brix must is also more of a candidate for other microbial issues, such as VA or Brett

Cleanliness

- Scenario: Four straight days of rain, our Chardonnay is covered in botrytis. It is not ripe.
  - The more botrytis that ends up in the must, the more difficult it will be to produce a clean wine, so:
    - Step 1: Can we “dry out” the botrytis with spray?
      - Drying out the fruit would buy us more time to ripen the fruit. If the botrytis is going to spread, it is not advisable.
    - Step 2: Pick immediately
    - Step 3: Field sort prior to or during picking
      - This is a nightmare during the day of picking but works wonders
    - Step 4: Sort the fruit in winery, prior to pressing
    - Step 5: Press the fruit. *Always* quantify the amount of rot that ends up in the press
      - “A lot” of rot won’t mean anything in your notes 5 years later.
      - There is no standard measurement for this – you need to create a vocabulary you can use to reference

Cleanliness (cont.)

- Kill off the botrytis as quickly as possible
  - Increase your level of SO2 used during the press cycle
  - Minimize contact between the juice and the skins
- Settle the wine as quickly and as thoroughly as possible
  - Get the must cold
  - Utilize a high dose of settling enzymes in order to settle the juice as cleanly as possible after pressing
    - Consider other products specific to rot issues to assist in settling
  - Note: cold settling after pressing is *crucial*: the cleaner your wine is on day 2, the better shape you are in. If it is fermenting the next morning, you're in trouble.
- Then, inoculate. But adjust your fermentation technique
  - We want commercial yeast to take control of the ferment as quickly as possible. A higher dose of yeast with the shortest lag time is best. Be aware of the nutrient needs and adjust the must accordingly.

Cleanliness – it is important to:

Know your bunch rots

- Botrytis
- Sour rot
- Ripe rot
- Black rot
- Downy mildew
- Powdery mildew
- Penicillium
- Et cetera.
- Rots can also be due to:
  - Spotted Wing Drosophila
  - Bird Damage
  - Berry Splitting
  - Sunburn
  - Wrong place wrong time

Know what they taste like

- I'm serious. Taste them.
- The difference between 5% botrytis on Vidal Blanc and 5% sour rot is very large. Some bunch rots are more problematic than others, and it is important to keep this in mind if it effects your picking decisions and thus your final wine.

Summary

- Balanced fruit tends to product the most “harmonious” wines, but is difficult to achieve
- It is important to understand *what* makes fruit balanced (pH, TA, ripeness, etc.), *why*, and *how to measure them*
  - Especially important for subjective qualities
- We have methods of adjusting fruit parameters in order to make better wines, as we need to use them when required

Thank you!

Please don’t hesitate to reach out:

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