The Henry Wine Group

WHOLESALERS • IMPORTERS • BROKERS

Presented by
Kevin Butler
Regional Manager, Orange County & Long Beach

WSET CERTIFIED Advanced

Beginning Wine:

A Guide to the Fundamentals of Vine-Growing, Winemaking, & Wine Tasting

I. Basic Chemistry

A. The Fermentation Formula:

Yeast + Sugar = Alcohol + Carbon Dioxide + Heat

1) yeast is an organism which consumes the sugar in grape juice (must)
2) fermentation ends when
   a) the yeast has consumed all available sugar (this is a "dry" wine, i.e. no sugar) or
   b) the yeast has produced too much alcohol and can no longer survive (this happens naturally somewhere between 12-15%, although certain strains of yeast ferment as high as 18%)

B. Why Grapes?

1) Higher concentration of sugar than any other fruit = more "fuel" for fermentation
2) The Chemical Reason: Winegrapes are extremely complex, with as many as 300 different chemical agents present which can affect taste and aroma.
3) The Poetry of Chemistry: A raspberry tastes like a raspberry, but a winegrape, with its intense chemistry can taste like . . . raspberry, quince, pomegranate, passion-fruit, kiwi, cherry pie filling, bitter black chocolate, sage, sweet tobacco, etc.

The Advanced Class: What Are these "300 active chemicals"? We are mostly interested in: 1) ***Acids****: Citric, Malic, & Tartaric at first, but later Lactic & Acetic.*

2) ***Polyphenols****: Tannins (structure and astringency) & Anthocyanins (color)*

3) ***Esters****: combinations of acids and alcohols which carry aromas—they frequently break-up and reform in different combinations, changing the wines aroma as it ages.*

*4)****Flavenoids****: The name says it all. These compounds are extremely potent and are detectable at 1 part per trillion!*

II. The Cycle of the Vine

A. Winter Dormancy & Pruning

- Springs soft shoots turn to hard wood, or "canes," in the vine's dormant winter season
- These canes have numerous buds
- Winemakers prune aggressively, leaving 2-3 buds at the base of each cane
- **<u>Pruning limits crop-size</u>**
- Smaller crops, 1) ripen better and 2) have more focused flavor intensity

B. Early-Spring, Bud-Break

- After Winter's frosts stop, the dormant vine comes to life with new buds
- **<u>Everything, shoots, leaves, flowers, and eventually fruit, are contained in compact buds the size of a pea.</u>**
- These tender buds are vulnerable to sudden frosts.
- Frost after bud-break can destroy an entire crop

C. Mid-Spring, Flowering & Fruit Set

- Grape vines produce tiny flowers which are little more than pistols and stamens.
- These delicate flowers require sunshine and a gentle wind to properly fertilize and establish "berries"
- Strong winds or rains will break off these flowers producing "shatter" i.e. clusters that have empty spaces where individual berries should be.

D. Mid-Spring, Canopy Management

- Vines grow prolifically, vintners train the vine's shoots and leaves which are collectively known as "the canopy."
- Light is important for the leaves as photosynthesis creates the sugars which are stored in the fruit.

- Heat is also important and must reach the grape directly or it will not ripen fully. The grower on the left is pulling leaves to expose the fruit and encourage ripeness.
- Too much direct light can "sun-burn" the grapes, or worse, turn them into raisins.
- Vines have a tendency to ripen un-evenly, from cluster to cluster, even grape to grape on the same bunch.
- **<u>Canopy Management ensures even and complete ripeness.</u>**

E. Late-Summer, Verasion (i.e. Coloring)

- When the grapes have been on the vine maturing for about 90 days, they begin to change color—**this change to mature colors is known as "verasion."**
- **Verasion marks the grapes ripeness and is a critical moment for the winemaker to prune—thinning clusters which are behind or uneven in ripeness and concentrating the vines effort on a smaller crop**

F. Early-Autumn, Harvest

- **Harvest is later in cooler climates, earlier in warm areas. Cool climate = longer "hang time," or more time on the vine accumulating flavor.**
- Cool weather also preserves acidity in the grape, both in the long run and the short run, i.e. **cool climates = higher acid wines**, but also grapes picked at dawn have higher acidity.
- **Extended ripeness, "*sur-maturité,*"produces wines with richer denser fruit, but lower acidity.**
- **Yield Size is one of the most important variables in wine quality,** jug wines = 15-20 tons/acre whereas many of the best wines average about 2 tons/acre.
- **Best wines are always hand picked**

Advanced Class; Phylloxera History: This small aphid-like pest was the cause of the largest catastrophe the wine industry has ever endured, and with its devastating effects brought massive changes to the wine industry world-wide. Phylloxera is a native to North America and has always nibbled on the roots of native species of grape-vines. However, all wine grapes (*vitis vinifera)* are European in origin and have no native defense to phylloxera. These vines simply "bleed" slowly from tiny bites, losing sap and vigor until they finally die.

Thomas Jefferson brought vines from France but was mystified to discover the vines always died a few years after taking root. Through agricultural trade, phylloxera was unknowingly transported to California in the 1880s and France as early as the 1860s. By the late 1800s, 90% of Europe's

Vineyards had been destroyed by this hidden pest. The ultimate solution to this pest was not eradication, but combining the natural defenses of North American plants with the fruit properties of European "clones" or "Scions." Today, most vines world-wide are grafted: American roots, with European shoots, leaves, and fruit.

Some of the long-term effects of phlloexera are:

1) Loss of many historical vineyards, some were never replanted.
2) Loss of some traditional European varieties, ex. Mourvedre in Chateauneuf du Papes
3) Better understanding of the importance of clonal material to the quality of finished wines.
4) Extensive studies on the effects of soil on grape growing.

II. Winemaking Variables:

A. Fermentation Vessels:

1) Oak Barrels: Oak allows a wine to breath during fermentation but does not control the temperature. Barrel fermented wines are typically rounder and thicker in texture than wines fermented in steel. Also, acid levels are perceptibly lower.
2) Stainless Steel: Stainless steel allows for a more precise, chemical control of the fermentation process. These cooler fermentations are less risky and tend to produce less "off aromas" from fermentation. Also fruit tones are brighter and purer. More high-tone aromatics are preserved in steel which is especially important for white wine.

B. Malolactic Fermentation: This secondary fermentation is not an alcoholic fermentation, instead it is a bacterial transformation of Malic Acid (sharp acid commonly found in tart green apples) into Lactic Acid (the same acid found in milk). All red wines undergo this process. It is only an option for whites where the effect can be a strong, "buttery" flavor.

C. Aging: The aging process varies widely and is extremely different if it carried out in an anaerobic environment (no oxygen—like a bottle) or in an aerobic environment (barrels breath).

1) Barrels: Many red wines today are fermented in steel and transferred down to barrel to age 10-18 months, during this time:
   a) the fruit will soften and come into balance (barrel samples often taste exaggeratedly sweet, almost like syrup)
   b) Tannins will soften and intergrate (reds only): tannin molecules will drop out slowly as the combine with O2 and form solids, also small molecules will link up and create a softer, silkier impression.
   c) Barrel flavor = smoke, spice, vanilla—sometimes adding a hard tannin.
2) Bottles, Tanks, or other anaerobic vessels: Flavors and aromatics are typically long molecular chains, these will break up and recombine, creating a better integration of flavor and slowly building new facets of the wine. Tannins will also soften slowly.

D. Fining, Filtering: These are optional processes used to "clean-up" the wine before bottling.

1) Fining: Wines typically contain a cloudy sediment of pulp, particles of grape-skin, and yeast. A clarifying agent such as egg whites can pull these sediments in a solid mass which can easily be separated from the wine.
2) Fining as Tannin management: Tannins are attracted to proteins and can be gently removed form a wine with certain protein fining agents, making the wine softer but inevitably removing some of its depth and weight.
3) Sterile Filtering: commonly done to prevent re-fermentation in the bottle. If the wine contains living yeast cells they may come back to life in the presence of small amounts of sugar. This is a common, but aggressive treatment.

III. Tasting the basics: "The Fours S's"

A. Sight: a wines color will give an initial idea of its depth and intensity, also the legs of a wine will give an indication of alcohol levels (distinct and slow moving = high alcohol, fast moving and thin = low alcohol)

B. Swirl: This brings out a wines aromas, lifting them from a liquid to a gaseous state, also this will "open up" a wine, allowing it breathe, soften, and integrate.

C. Sniff: Aroma is one of the principal pleasures of wine and 90% of taste. Look for:

1) Fruit aromas: name 3 if you can: Citrus vs. Malic / Red Fruit vs. Black Fruit
2) Wood: oaky, smoky, spicey
3) Floral or Vegetal scents: ex. Roses or Rosemary?
4) Earth: organic (*ex: "forrest-floor")* vs inorganic (*ex:"stony"*)

D. Slurp: bringing in air while the wine is still in your mouth helps to accentuate the flavors.—fun, but unnecessary.