

Advances in Grape and Wine Production



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Tradition versus Science

- The wine industry has a strong tradition of being outwardly resistant to change
- The general position is often that a “naturally” made wine is a better wine
- Much of this is related to marketing



“Our clear directive is to bottle our wines with the least amount of winemaker manipulation. We aim for unfinned and unfiltered wines, allowed to express themselves as purely and vividly as possible. There is no room for errors, tricks, or compromises. If each stage of the winegrowing and winemaking process are performed with diligence, fining and filtering the wine is an unnecessary step that only serves to hide mistakes or shortcuts. Ultimately, unfinned and unfiltered wines are more expressive layered and delicious. Of course, this approach requires more attention and risk, but if conducted thoughtfully, the benefits are incalculable.”

What are the Characteristics of Great Wine?

- The ability to:
 - please both the palate and the intellect.
 - hold the taster's interest.
 - offer intense aromas and flavors without heaviness.
 - Taste better with each sip.
 - Improve with age.
 - Display a singular personality.
 - Reflect the place of origin.



Photo by Jean-Luc Chapin

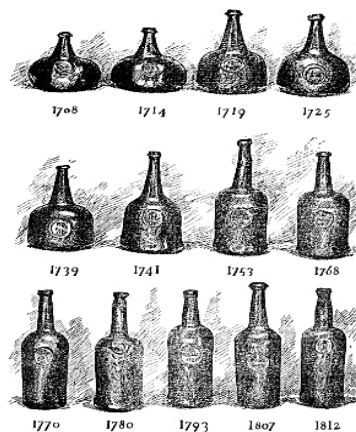
Short History of Wine

- Wine is easy to make.
- Predates recorded history.
- Strong religious association.
 - Wine is mystical
- Wine has been present throughout the development of western civilization.
- Advances during Egyptian, Greek and Roman periods
 - Viticulture
 - Winemaking
 - Pottery
 - Sulfur dioxide



Modern History

- Change accelerated in 18th and 19th centuries
 - Impact of trade
 - Scientific advancement
 - Mid 18th century: bottles optimized for storage
 - Vintage, age-worthy wines appear
- 20th century and beyond
 - Change is a constant



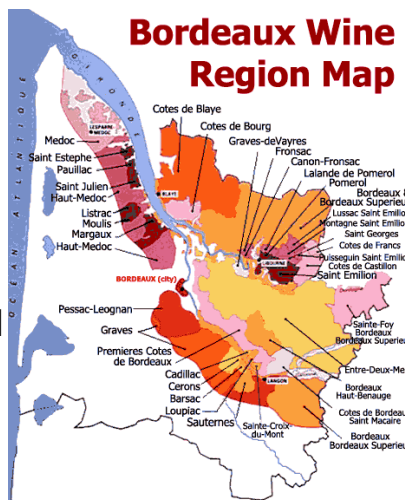
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Are tradition
and science
mutually exclusive?

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Bordeaux Wine Region

- Wine production began in the 1st century A.D.
- 2nd largest wine growing region in the world
 - 284,320 vineyard acres
 - 57 appellations
 - 9,000 wine producers
 - 13,000 grape producers
- 700 million bottles produced annually



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The Story of Two Wineries

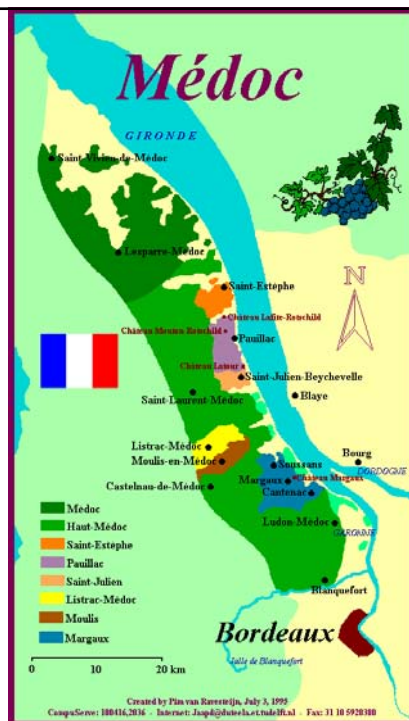
- Chateau Margaux



- Chateau Latour



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History of Chateau Margaux

- Estate occupied since the 12th century
- Margaux established vineyards in 16th century
- By 1700, estate vineyards covered the current area of 78 hectares.
- Vineyard area is essentially the same today.









History of Chateau Latour

- Estate occupied since the 14th century
- Vines have existed on site since 14th century
- Site of a garrison fort to protect the Gironde.
- Tower was destroyed in the 15th century and rebuilt in the 17th century
- Wine production became a focal point in the 17th century.

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Bottle Prices

- Chateau Margaux
 - 2010: \$1200/750 ml bottle
 - Ready to drink in 4-5 years
 - Good for 30+ years
- Chateau Latour
 - 2010: \$1600/750 ml bottle
 - Ready to drink in 4-5 years
 - Good for 35+ years



The question to ask:

What sells better
tradition or science?

Tradition in wine production can be characterized by adaptation and innovation



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Do you lie on the side of tradition or science?

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Wine Closures

- Wine bottles are most often closed with cork closures
 - Cork closures have been used for many centuries
 - Cork is a natural product produced from the bark of cork trees
 - There is inherent variation in cork composition
 - Cork is prone to imparting off flavors to wine
- There are alternatives to cork
 - Synthetic stoppers
 - Screw caps



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Screw Caps

- Properties of screw caps
 - Consistent product
 - Effective at controlling oxygen
 - Often cheaper than cork
- Some wine industries have adopted screw caps as the closure of choice
 - Experience has shown that screw cap use is consistent with preserving wine quality

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Advances in the Vineyard

- Technical needs
 - Monitoring vine performance
 - Understanding where variation lies
 - Labor
 - New variety
 - Disease resistance
 - Rootstocks
 - Scion
 - Physical issues



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Vine Monitoring

Sébastien Payen (left)
and
Thibaut Scholasch
Wired Magazine
10-21-12



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Vine Monitoring



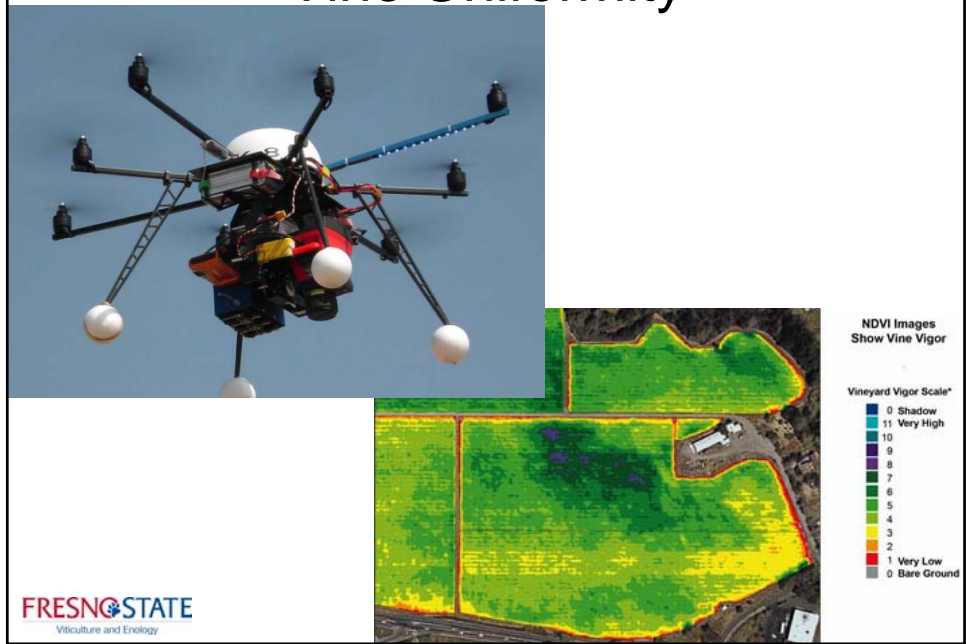
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Vine Monitoring



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Vine Uniformity



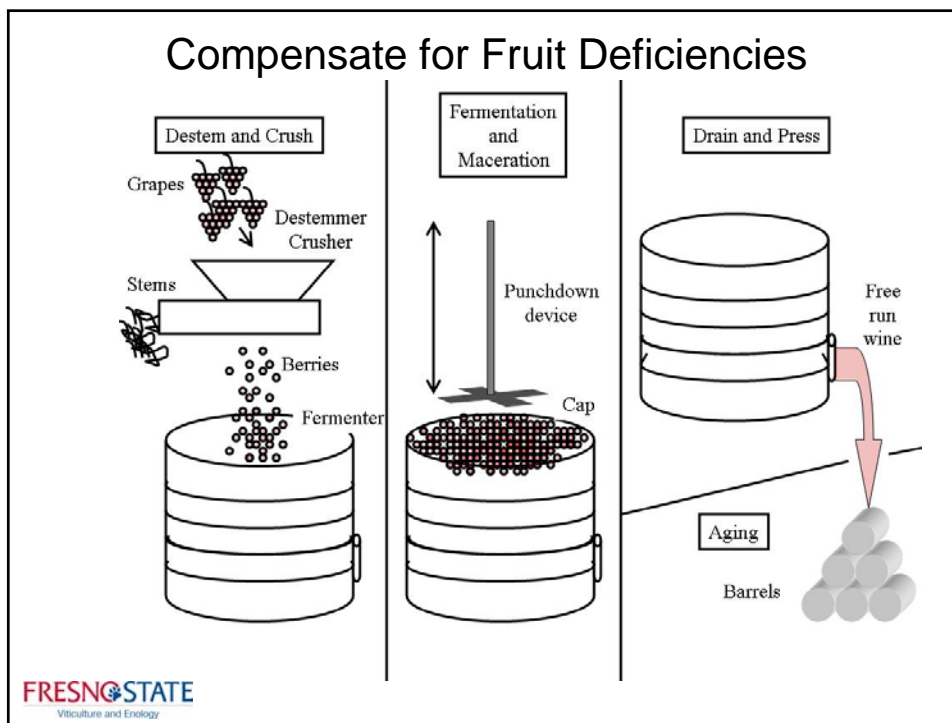
Labor Issues

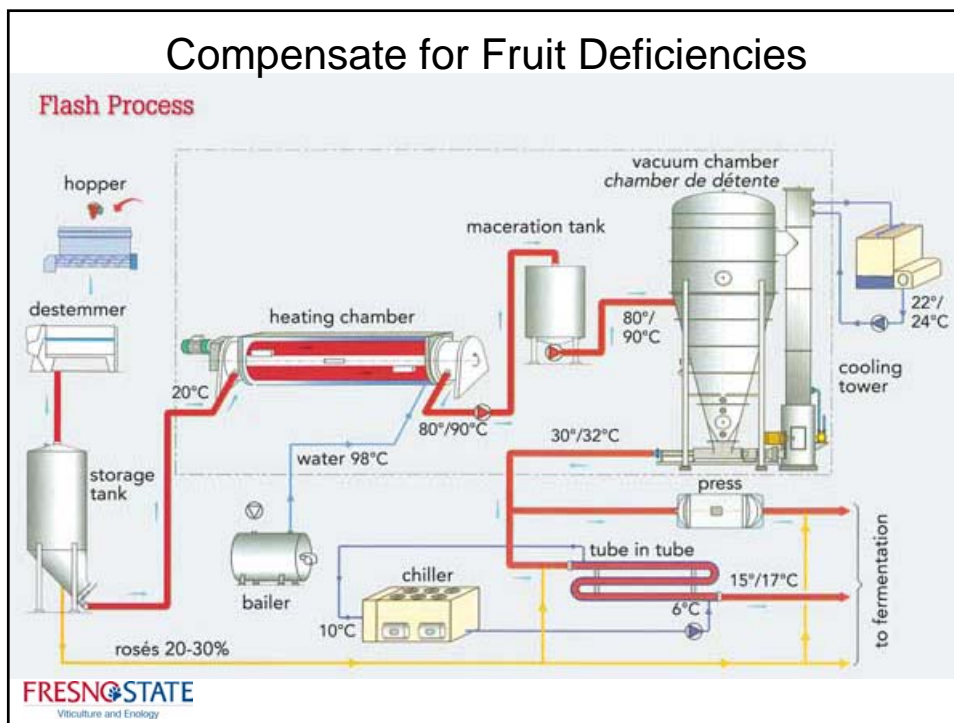
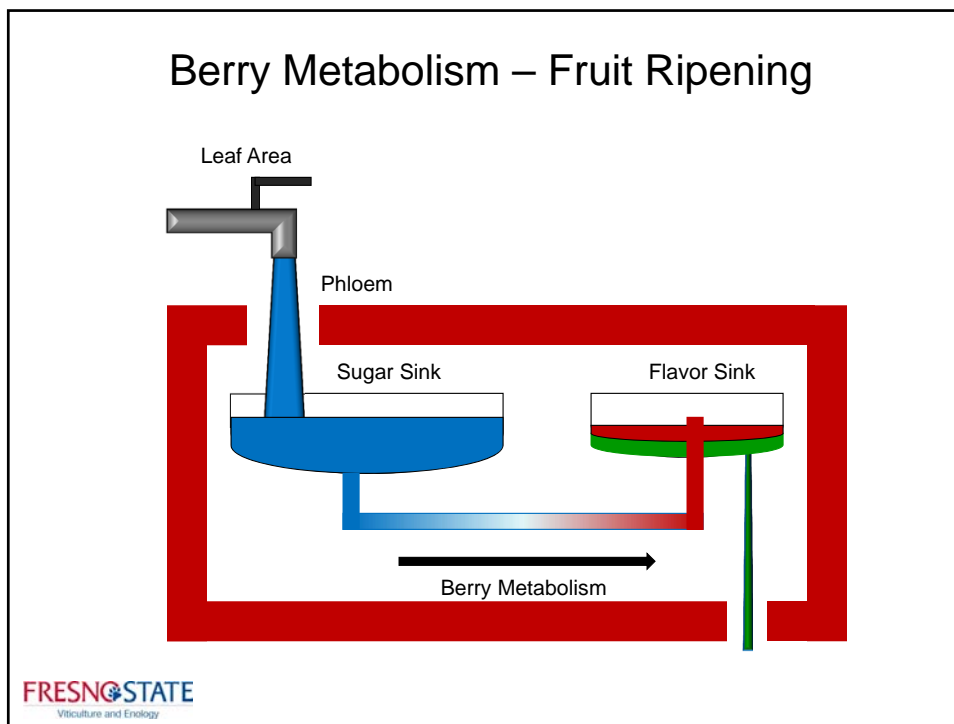


Advances in the Winery

- Technical needs
 - Compensate for fruit deficiencies
 - Green flavor
 - Fermentation success and complexity
 - Aging
 - Wine stability
 - Preserving wine quality
 - Reducing energy consumption
 - Cold stabilization

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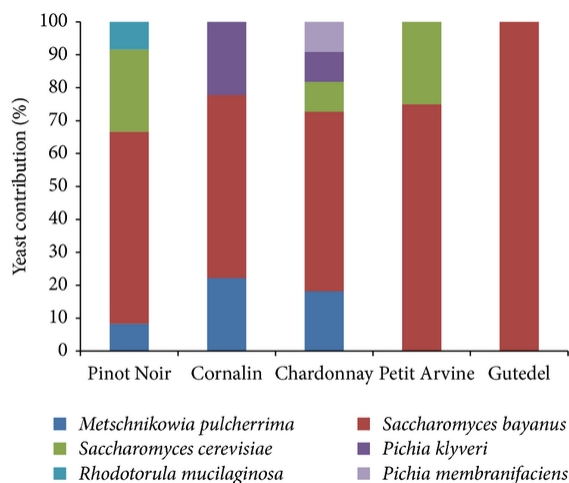




Fermentation Complexity

- An argument for uninoculated fermentations has been that the resultant wines are more complex.
 - More yeast strains equivalent to more complex products
- Uninoculated fermentations are more prone to spoilage
- Single strains have been recommended

Fermentation Complexity



Aging

- Two important processes occur during cellar aging in small oak cooperage
 - Slow oxidation
 - Flavor extraction



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Aging



Segment bags tied to stainless cable inside 20,000 gallon tank



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Summary

- The wine industry is becoming increasingly complex technologically
 - Consumer demand for consistently good products
 - Increase economic pressure
- Tradition will always have a place in the story

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