Wine Basics
From grapes to Glass

Claudia Steen

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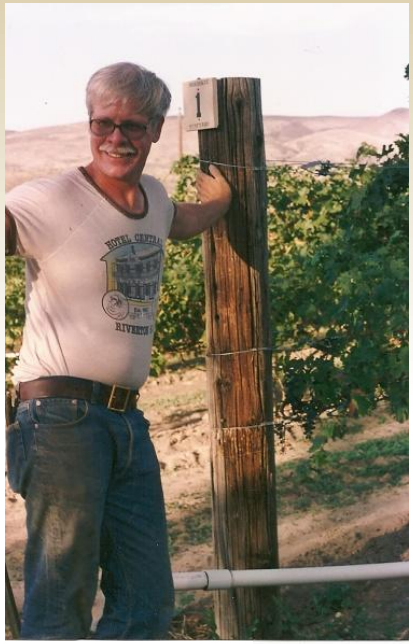
Definitions



Viticulture

The science and business of growing wine grapes

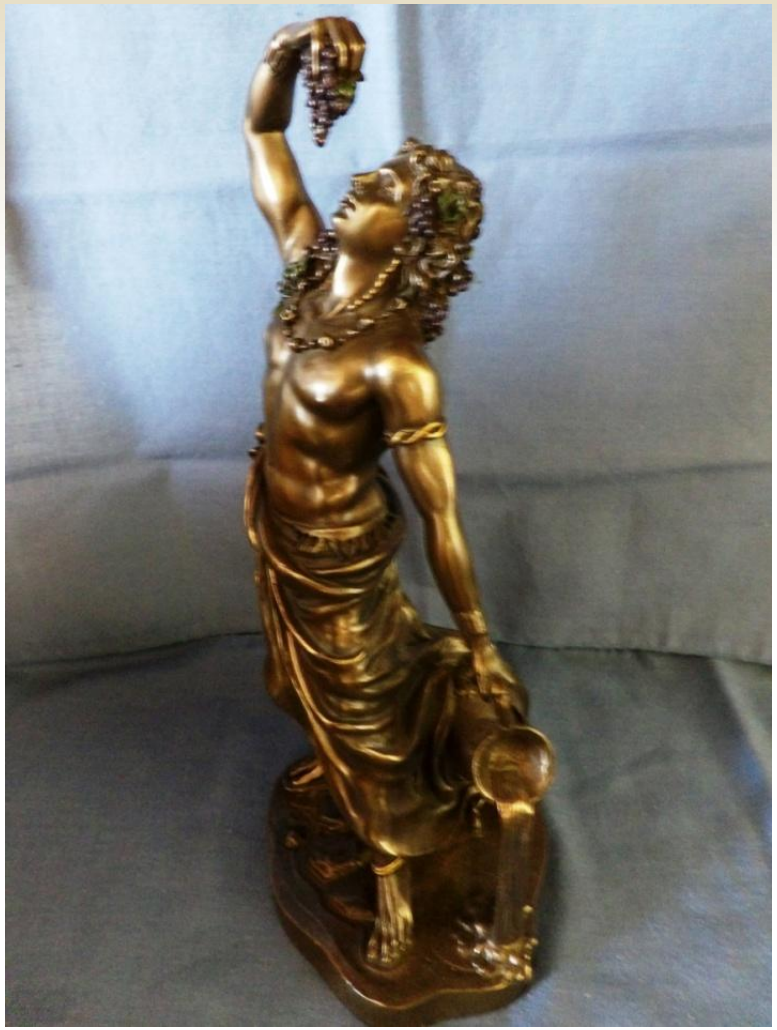
- Vigneron - Cultivator of grape vines / wine maker
- Vitis vinifera – wine grape (Genus/species)

Enology

- The science of wine production
  - Enologist (vintner) - wine maker
  - Enophile - someone who enjoys wine

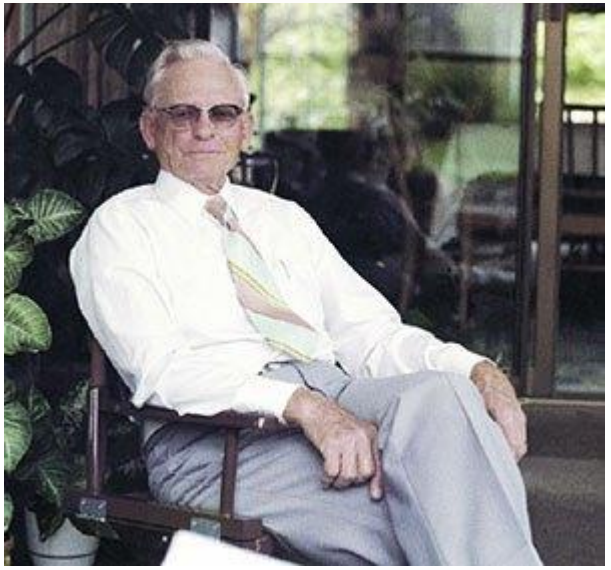
History of wine

- Earliest wine 8000 BC in Mesopotamia
- 2500 BC - Egyptians
- Greek & Romans worshiped a god of wine
  - Bacchus – Roman
  - Dionysus - Greek
- Wine is referred to in the Bible
- Middle Ages - monks took the ancients' knowledge of winemaking and refined it



History of WA wine grapes

- First vines planted in WA state in 1825 Fort Vancouver – Hudson Bay Co.
- 1860 in Walla Walla
- Dr. Walter Clore – father of Washington wine
- 2014 statistics – WA Wine Commission
    - 50,000 acres in production
        - 40 + varieties planted
    - 350 grape growers
    - 227,000 tons of grapes harvested
    - 890 + wineries
        - 16 million cases of wine produced
        - 4.4 billion dollar industry



53% white wines
47% red wines

Health Benefits of Wine

- Wine, *in moderation*, is a health benefit:
  - decreased incident of heart attacks & strokes (the French paradox)
  - reduce tumors
  - block formation of amyloidal plaques which contribute to Alzheimer's
  - better dental health, etc
  - Flavonoids - Anthocyanin in grape skin give red color
- decreases cholesterol
  - Rich in antioxidants

Health Benefits of Wine

- Resveratrol – a class of antioxidants known as polyphenols
- Found in tannins in grape skin, seeds, stems
- Is produced by plants to ward off fungal infections and other diseases

WINE IS MADE IN THE VINEYARD

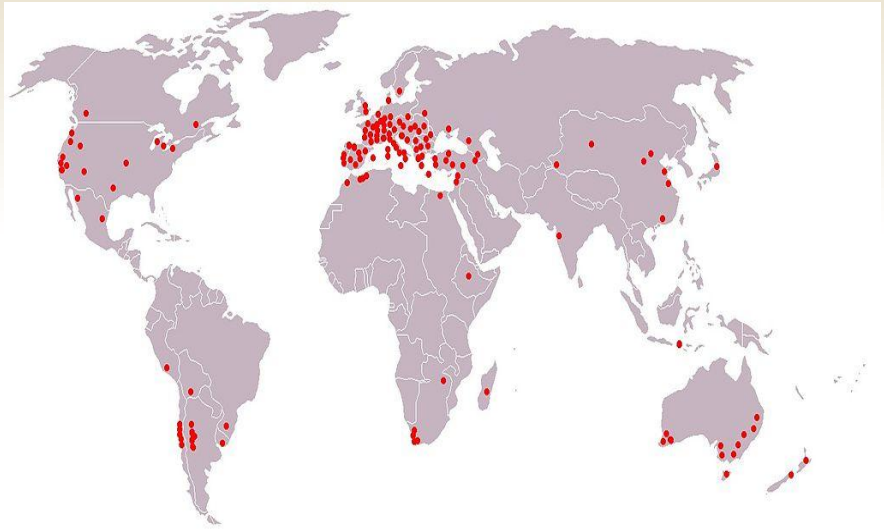
Wine grape growing primarily between 30-50 degrees latitude

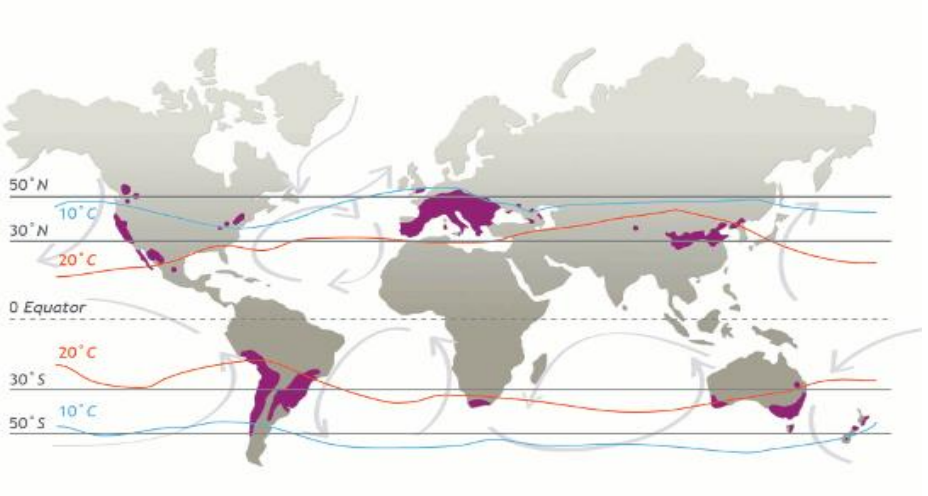
- **50 degree** - cool climate wine characteristics

  6-7 months to ripen, ↑ acid, ↓ sugar (alcohol), lighter color, not as fruit forward, more delicate body

- **30 degree** - warm climate wine characteristics

  4-5 months to ripen, ↓ acid, ↑ sugar, deeper color (↑ skin to pulp ratio), fuller body, more fruit forward





Areas of the World with highest wine production

USA production

#1 – California

#2 – Washington

#3 – New York

Terroir

Sense of place

- French for terre – land
- Influenced by:
  - geography
  - geology (soil type)
    - Mosel region - blue slate
    - Champagne region – limestone
    - Yakima Valley – Missoula floods
  - climate (water, sunlight, temperature)
  - plant genetics
  - microclimates

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Appellations

- **Unique growing regions**

  Old World - Europe & Mediterranean

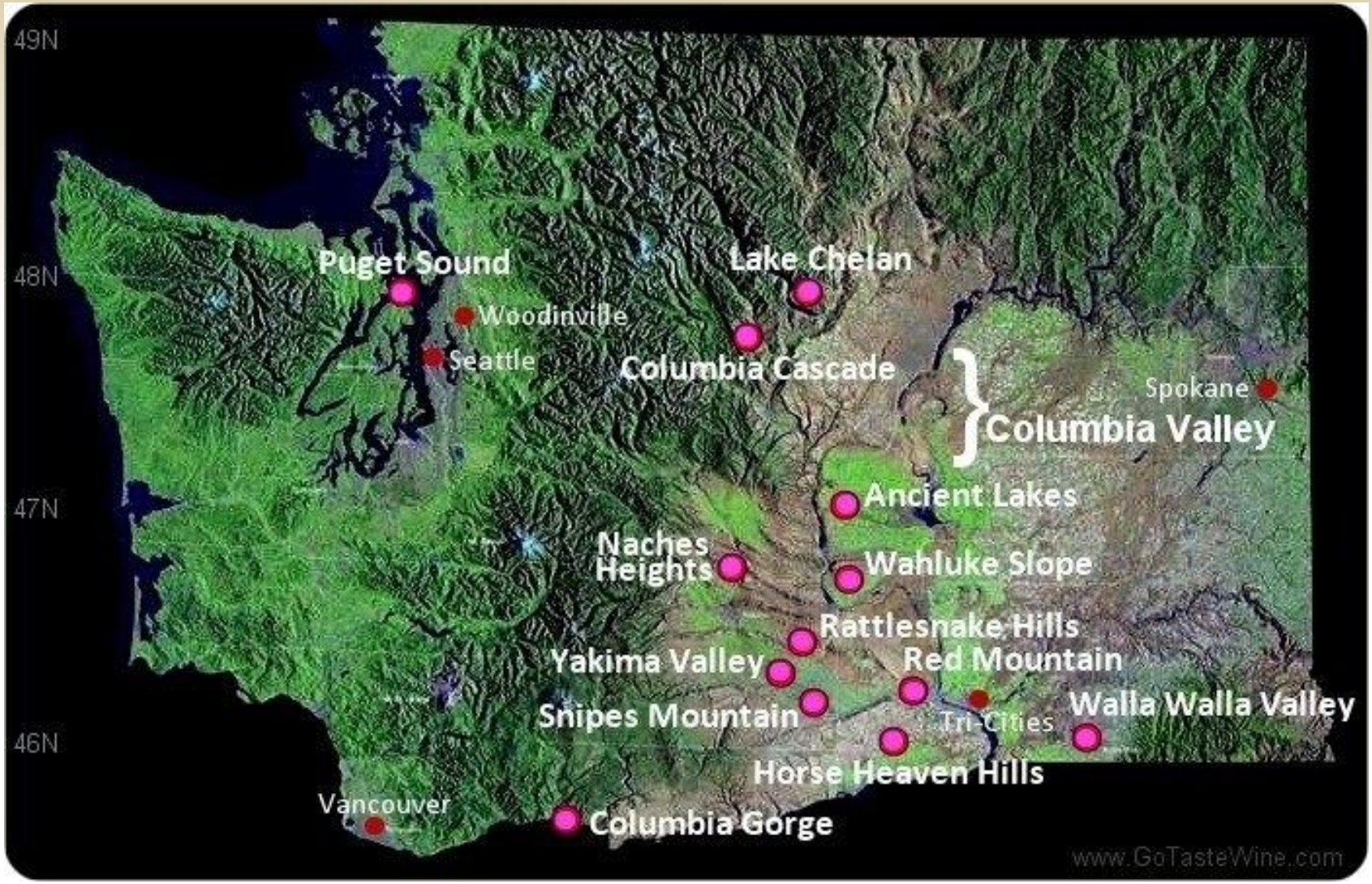
  - can have mineral notes Burgundy, Loire, Champagne, Bordeaux in France
  - wines often labeled by region
  - Chablis = Chardonnay
  - Chianti = Sangiovese
  - Sancerre = Sauvignon Blanc

  New World - All other areas (green)

  - S A (Chile, Argentina), South Africa, America (CA, WA, OR, NY), Australia, NZ
  - wines often labeled by the grape varietal
  - Cabernet, Chardonnay, Riesling

Appellations

- **AVA** - American Viticulture Area
- WA state has 13 appellations
  - Yakima Valley - 1983
  - Walla Walla Valley - 1984
  - Columbia Valley 1984
  - Puget Sound - 1995
  - Red Mountain - 2001
  - Columbia Gorge 2004
  - Horse Heaven Hills - 2005
  - Wahluke Slope - 2006
  - Rattlesnake Hills - 2006
  - Snipes Mountain - 2009
  - Lake Chelan - 2009
  - Naches Heights - 2011
  - Ancient Lakes - 2012



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In the Vineyard

- Grape harvest
  - Picked when grapes ripe approximately 24 brix of **sugar**
  - Read in refractometer (hydrometer) measures total solids in a solution

    Glucose or fructose plus yeast converts to ethanol plus carbon dioxide during fermentation

    $C_6H_{12}O_6$ + yeast =

    $2\ CH_3CH_2OH + 2\ CO_2$
- 2 brix = 1% sugar = 1% alcohol

In the Vineyard

- Acids

Picked when grape **pH** is approximately 3.2 - 3.4 found in the grape berry pulp

- Other indicators of ripeness
  - Leaves turn brown and photosynthesis slows or stops
  - Seeds inside go from green tinge to brown
  - Squeeze berry, pulp is juicy & tastes good!

Lab report on “must”

Acids - gives wine body and structure

- Titratable acidity (TA)
- pH
- L - Malic acid - harsher acid
- Tartaric acid - the principal acid in grapes promotes flavor and aging in wine
- Lactic acid - softer acid

ETS LABORATORIES

LABORATORY REPORT # 835300S

TR Wines
Attn: ACCOUNTS PAYABLE
52015 Seven Hills Road
Milton-Freewater, OR 97862

Samples Received
22 September 2015 12:57 pm

Analysis Reported
22 September 2015 3:42 pm

Analyte	Result		Analysis Date	Method Reference
509220640 15KWMB				
titratable acidity	4.8	g/L	9/22/15	
pH	3.54		9/22/15	
L-malic acid	1.94	g/L	9/22/15	
tartaric acid	5.1	g/L	9/22/15	
brix	24.0	degrees	9/22/15	
glucose + fructose	250	g/L	9/22/15	
ammonia	31	mg/L	9/22/15	
alpha-amino compounds (as N)	48	mg/L	9/22/15	
yeast assimilable nitrogen	74	mg/L (as N)	9/22/15	
potassium	1680	mg/L	9/22/15	

Harvesting the grapes

- Can be hand picked or machine picked
- Snips remove grape cluster to bucket
- Place full buckets into bins

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At the Winery

- Bins transported to the winery
- Grapes loaded into stemmer / crusher
  - Stems are removed and discarded
- White wine
  - Juice is pressed away from the skin & seeds
  - Juice goes into stainless steel fermentation tanks
- Rose' wine
  - Often use red grapes
  - Juice is pressed away from the skin & seeds
  - Imparts a pink color and then treated like white wine

At the Winery

Juice with skin and seeds is called **"must“**

- **Red wine**
  - Must goes into large vats for initial fermentation
  - Yeast (Saccharomyces cervisiae) is added
  - Cover with cloth (to keep out fruit flies)
  - Punch down cap daily (skins float - seeds (pips) go to the bottom)
  - Smell is wonderful!

Types of Wine

- **Still**
  - Cabernet – King of wine
  - Chardonnay – Queen of wine
- **Sparkling**
  - Champagne - France
  - Cava - Spain
  - Proseco - Italy
- **Fortified** (brandy)
  - Port – Ruby, Vintage, Tawny
  - Sherry

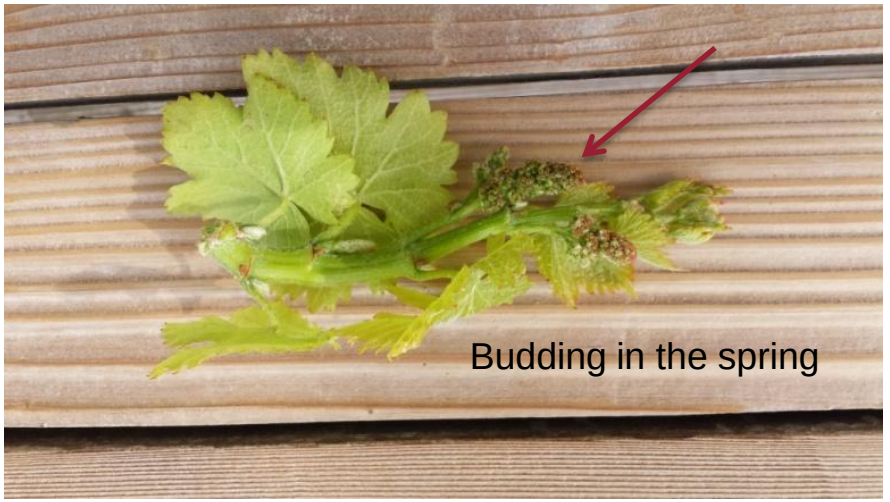
Wine grape Varieties

Noble grapes – most popular, grown worldwide

- Whites
  - Riesling
  - Sauvignon blanc
  - Chardonnay
- Reds
  - Pinot Noir
  - Merlot
  - Cabernet Sauvignon
  - Syrah (Shiraz)
- Many other varieties

Wine Production

- **Red wine**
  - After initial fermentation the wine is pressed off skin & seeds
  - Can have secondary malolactic (ML) fermentation (Lactobacillus bacteria)
  - The harsher malic acid is changed to the softer lactic acid
  - One bi-product is Diacetyl which gives a buttery flavor and enhances complexity
  - Placed into Oak barrels or maturation tanks

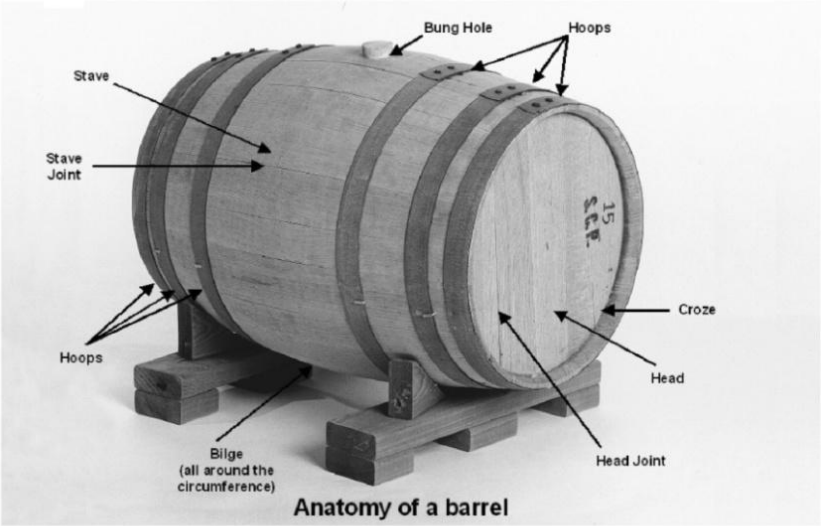

Budding in the spring

Wine Production

- **White or Rose wine**
  - Continue fermentation in cooled stainless steel tanks
- **Fermentation changes sugar to alcohol**
  - White/Rose wines - can stop fermentation process if residual sugar desired or zero if dry
  - Red wines often fermented to zero sugar

Maturation Process

- Racking over
  - Take wine off the top and place into another vessel - leaving the "lees" or sediment (dead yeast, seeds, grape solids)
  - Most reds (some whites) put into Oak barrels for barrel maturation
- Coopers cut oak staves and construct barrel



Anatomy of a barrel

Barrels are toasted

- Toasting (carmelization) of the wood imparts flavors to the wine
- Barrel flavors only lasts 2-3 years
  - Vanillin (phenolic aldehyde) $C_8H_8O_3$
  - Lactones (coconut)
  - Phenols a perceived sweetness
  - Spice notes, Leather, few tannins

- Can choose degree of toasting
  - Light - LT
  - Med – MT
  - Heavy – HT
- Now can get oak chips to add to wine in neutral barrels

Maturation Process

- Types of Oak
- American Oak - $$ stronger flavors
- French Oak - $$$$ tighter grain, better quality
- Hungarian Oak - $ not as strong flavors as American
- Neutral Oak – used in primary fermentation or maturation where little oak is required

- Topping off
  - Oak is porous and water evaporates
  - need to add wine to head space to discourage oxidation

Wine ready for bottling

- Filtering in order to clarify wine
- Fining done with White wine egg whites capture solids
- White/Rose often consumed within 2-3 years (exceptions - Chardonnay, Sauvignon blanc, etc)
- Reds often aged before consuming
- Controversy to fine Reds
  - red wine is often opaque, especially in thick skin grapes (Cabernet, Merlot)
  - many feel it will remove texture & structure

Types of bottles

- Bordeaux - shoulders
- Burgandy - slopped sides
- Rhine (hock) - tapered
- Others – bocksbeutel
- Specialty bottles
  - Champagne - thick glass/special stopper
  - Dessert wines - sweet often in splits
  - Fortified wines - Port

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Colors of glass

- Glass colors varies
  - **White/Rose'** wines in clear, light green, yellow green, blue
  - **Reds** in dark green, brown
- Important to shield from the light

- Why is there a Punt at the bottom of the bottle?
- Necessary when they were hand blown
- Traps the sediment
- Provides a more stable base
- No need - some bottles have no punt

Types of closures

- **Cork**
  - industry standard BUT
  - decreased supply of cork trees from Portugal - increased cost
  - composite cork often used
  - cork taint from low quality cork
  - oxidized wine from cork failure
- **Synthetic cork**
  - seems to not have any issues
- **Twist top - screw cap**
  - primarily used for whites/rose that are consumed young, fruit forward
  - Also now for reds - important to keep oxygen out of the bottle

How do you know a bottle has been oxidized?

- **White wines** take on deeper yellow color
- **Red wines** take on brownish color
  - Can smell volatile acidity (acetone) – VA
  - Cork taint - dirty socks/wet dog smell
  - Cork tree pesticides or chlorine bleach residue (so now use peroxide)
  - Corky mildew – TCA trichloroanisole fungi + chlorophenol compounds
  - Wine can taste like vinegar (acetic acid)

Life is too short to drink bad wine!

- **Foil** placed around top of bottle
  - Helps to keep cork sealed
  - Color is choice of winemaker

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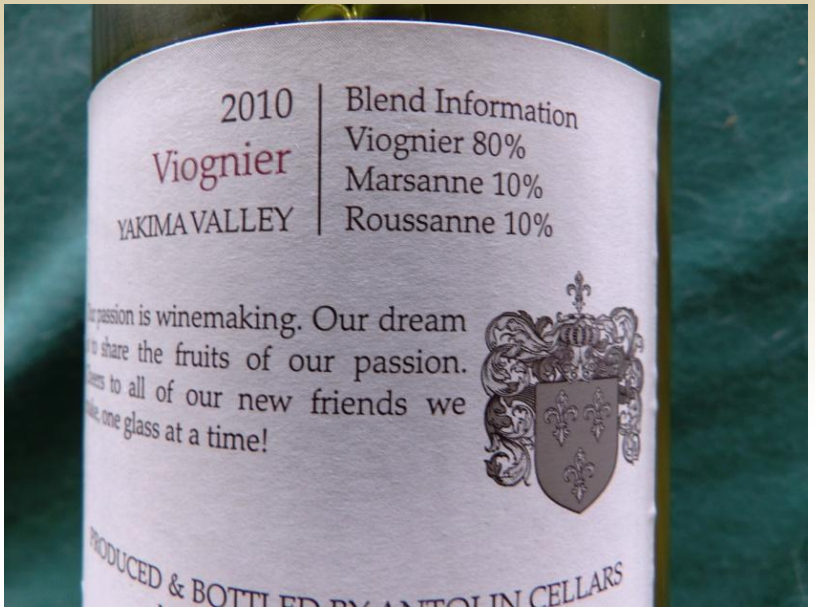
Wine Labels

- Label placed on bottle is winemakers choice as to design BUT some mandatory requirements:
- Must get approval from ATF
  - Vintage Date - Year grapes were picked
  - Name of the winery/contact information
  - Name of the wine varietal
    - Pure varietal - must be 80% by volume to be labeled as such
    - Blended wine – nice to state blend percentages
    - Can also make up name of wine
  - Estate Bottled – grapes from winery
  - Reserve designation – extra aging occurs
  - Net Content – 750 ml

Wine Labels

- Any oak information – kind, length, toast
- Appellation of Origin - AVA
- Vineyard designation (always nice)
- Mission statement / statement about the wine or winemaker
- Percentage of residual sugar
- Percentage of alcohol
- Government Warning requirement
- Declaration of sulfites if over a certain percent



Wine Tasting Event

- Showcase their selection of wines to the public
  - Need to assure no strong aromas in the area – cigars, strong perfume
- Before YOU go wine tasting
  - Assure you have eaten recently
  - Assure you keep hydrated
  - Cleanse pallet between wines with a cracker or sip of water
- Many offer tasting notes
  - Information on their wine selections

Wine Tasting Event

- Rule of thumb for serving
  - White before Rose'
  - Rose' before Red
  - Dry before sweet
  - Softer before more tannic

Best friends don't care if your house is clean. They care if you have wine.

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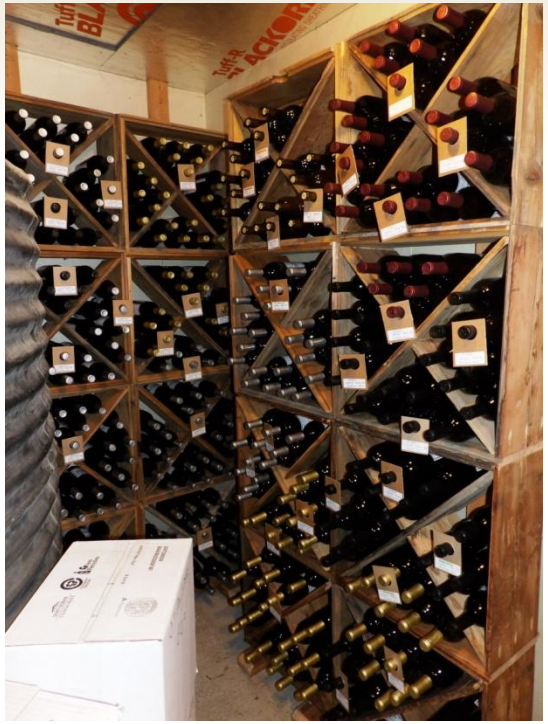
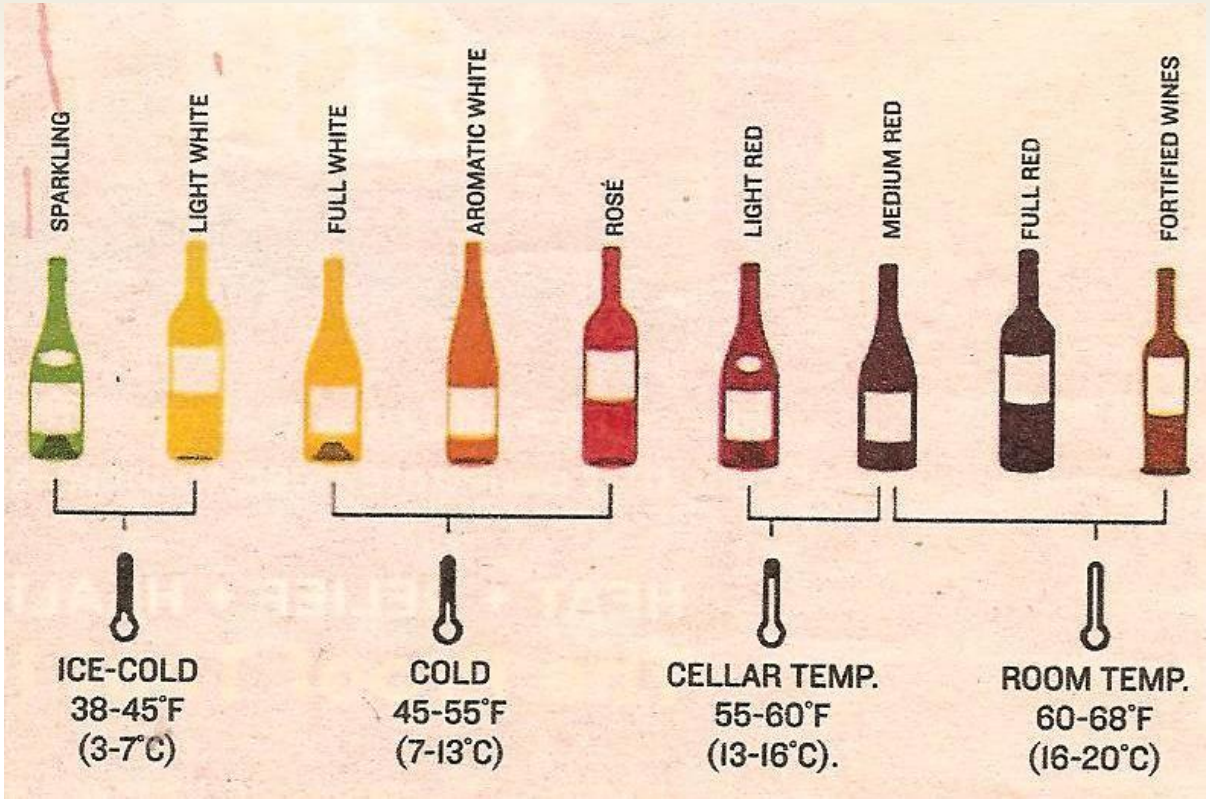
Temperature of Wine



Wine cellar for long term storage 60 degrees



Correct temperature enhances the flavor of wine

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Temperature of wine

- Before serving
  - Whites and Rose' often chilled (35-40 degrees)
  - Reds served at room temperature (55-65 degrees)
  - OK to slightly chill light bodied reds before serving
- Store all bottles
  - horizontal or up side down position so oxygen does not get into the bottle

Opening the bottle of wine

- Use foil cutter to remove foil over the cork
- Use wine key to remove cork
  - Winged cork screw
  - Ah -So cork puller
  - Waiters cork screw
  - Rabbit - easiest

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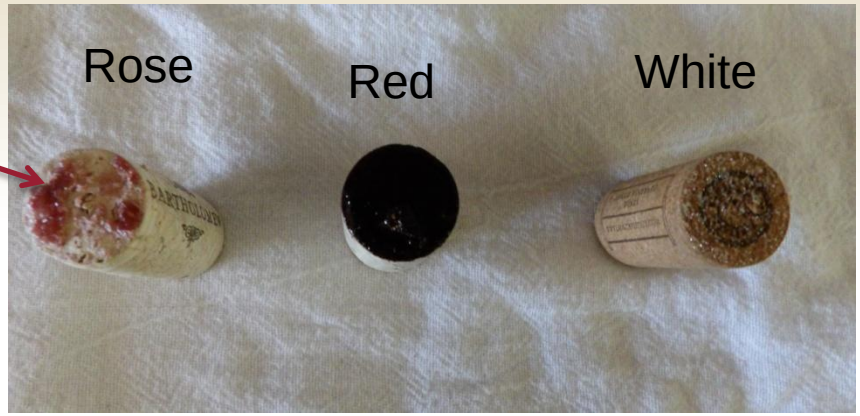
Saving the bottle of wine



- Wine diamonds
  - crystals of tartaric acid (tartrates)
  - seen on bottom of cork
  - does not affect the quality of the wine (cold stabilization)
- Any unconsumed wine

  Does that exist?!?!
  - Can use fancy stopper
  - Best to use vacuum sealer
- Removes oxygen from the bottle
  - Store white wine in refrigerator

Wine glass selection

- Many to chose from
  - Stemmed / glass
  - Stemless / plastic
- Riedel
  - Cadillac of wine glasses
  - hand blown
  - thin glass
  - shape is important
- White/Rose
  - Riesling glass
- Reds
  - Pinot glass
  - Bordeaux glass
  - Balloon glass

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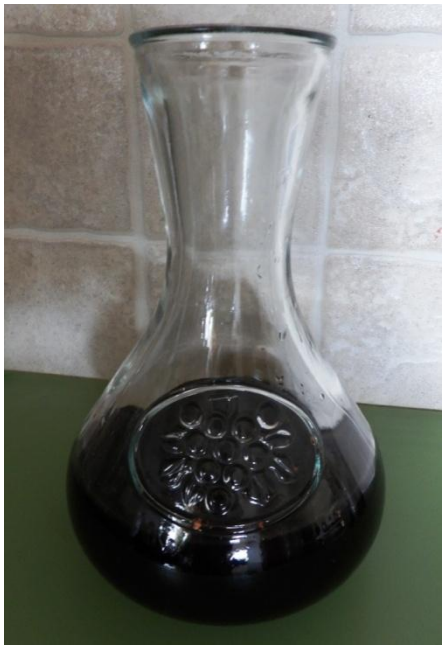
Pouring the wine into the glass

- For all wine
  - Host fills his glass first to remove any cork peices
  - Tilt the glass and pour wine down the side
  - Fill only ¼ cup if tasting
  - Fill glass half full if drinking (need room to swirl)
- For Red
  - Allow bottle to “breathe”
  - Pour gently as to not disturb any sediment
  - Pour through aerator or decant into another vessel

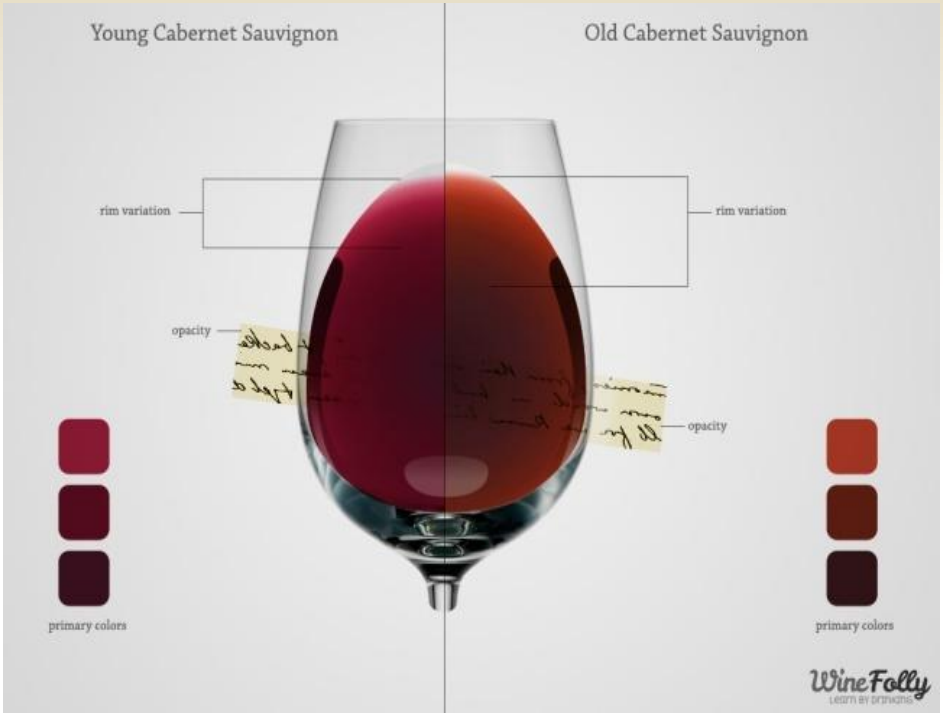


The Actual Wine tasting
The 5 S's

1. **See**

   color and clarity

   - Tilt the glass over a white background
   - Look at core of the glass and note color and intensity
   - Look at rim of the glass and note color
   - Note opacity
     - can you read text through the core?



1. young cabernet, 2. old cabernet/merlot 3. young merlot 4. young syrah, 5. young pinot noir, 6. old pinot noir

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The Actual Wine tasting
The 5 S's

2. **Swirl**

- Place glass on flat surface
- Move glass in circular motion
  - Causes aromas to be released
  - Can see the sheets or legs of glycerol that run down the glass

The Actual Wine tasting
The 5 S's

3. **Sniff**

- hold glass in the middle of your chest / smell
  - very aromatic wine
- hold glass at your chin
  - moderately aromatic
- put nose inside of glass
  - neutral or muted
- note what you smell
  - fruits, citrus, stone fruits, blackberry, green pepper, leather, etc
- LeNez Du Vin set
  - 54 wine aromas for students

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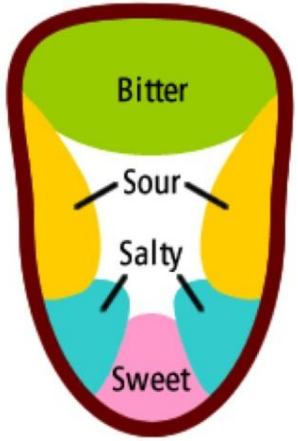
The Actual Wine tasting
The 5 S's

4. **Sip**
    - Take about a tablespoon - roll it around on your tongue
    - 1st sip - cleanse the pallet only - don't judge the wine at this point
    - 2nd sip - note the reaction on your tongue
        - sweet at tip – residual sugar
        - sour on sides - acidity
        - bitter at the back - tannins
        - mouth feel - texture - viscosity (skim milk, whole milk, cream)
            - it is light, medium or full bodied
        - thermo reaction - warmth is from increased alcohol



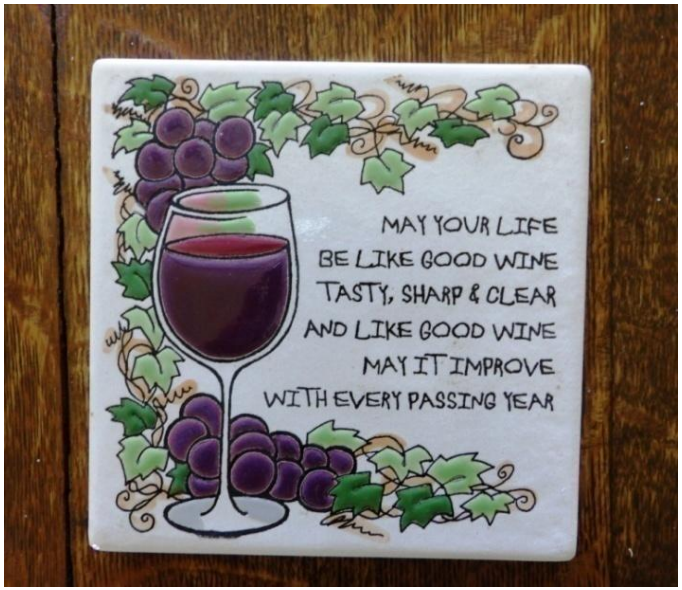
The Actual Wine tasting
The 5 S's

5. Savor

- Judge the quality of the wine
  - **Balance** - the relationship between fruit, acid, residual sugar, alcohol and tannin(velvety/drying sensation)
  - No one of these components should stand out significantly from the rest
  - **Finish**
    - how long flavor lasts
    - how did it leave your mouth
  - **Complexity** - layers of flavor
- Long list of descriptors
- In the end taste is very personal

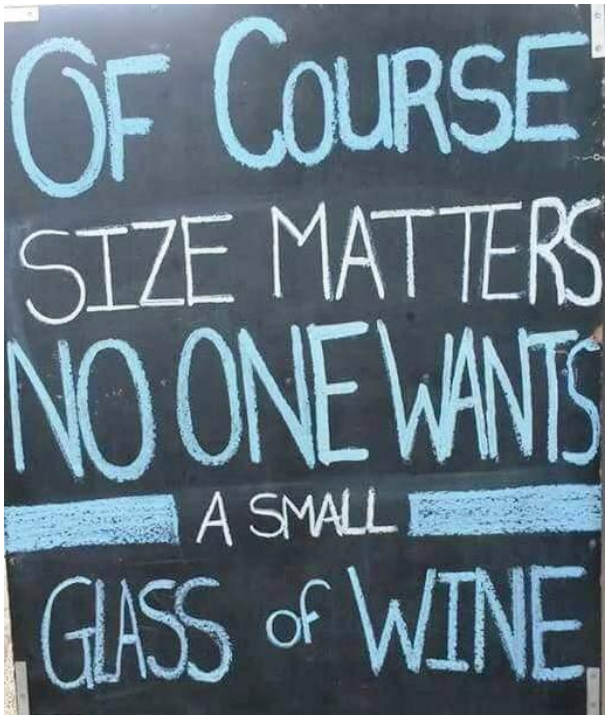
Wine is considered a food

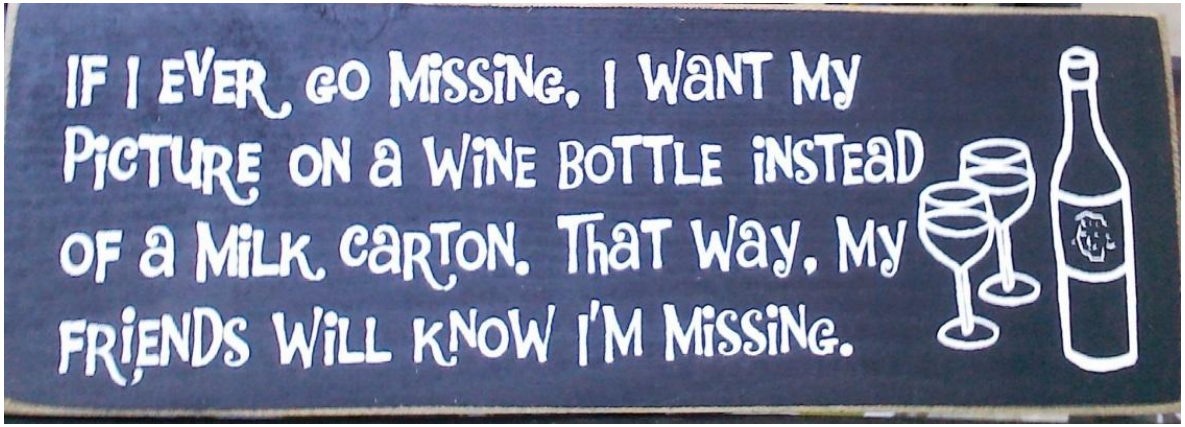
- Wine is best paired with food
  - Basic idea
    - Whites with fish
    - Reds with meat
  - But Much More!
    - Pairing charts available
- Wine is best enjoyed with family and friends



The Joys of drinking a Good glass of wine!

- Any Questions?





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Thank You

It's Wine o'clock somewhere!

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