Photo credit: Tomascastelazo (Own work) [CC BY-SA 3.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons

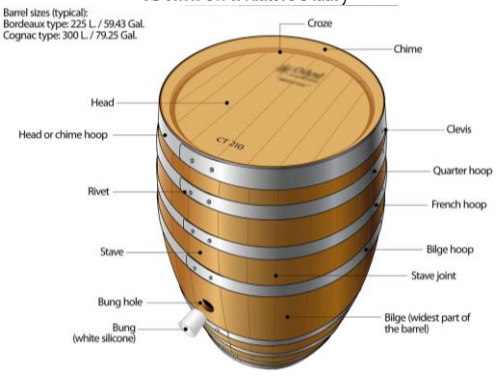
Objectives

- Name some factors in wood selection for wine barrels
- Describe the flavors a barrel contributes to wine
- Describe barrel making processes that affect wine flavors
- Detail the benefits of aging a wine in a barrel
- Discuss the effects of sur-lie aging in a barrel and barrel sizes

Wine Vessels

Wine Vessels

Barrel Anatomy



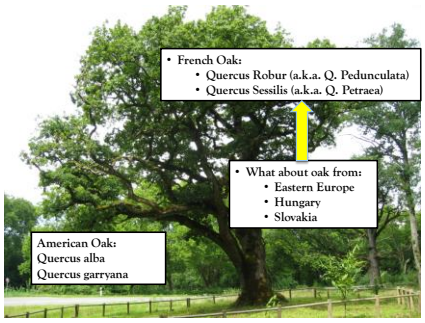
Acacia Barrels

- French Acacia:
  - Robinia pseudoacacia
  - Common name: Black Locust
  - Native to the south eastern U.S.

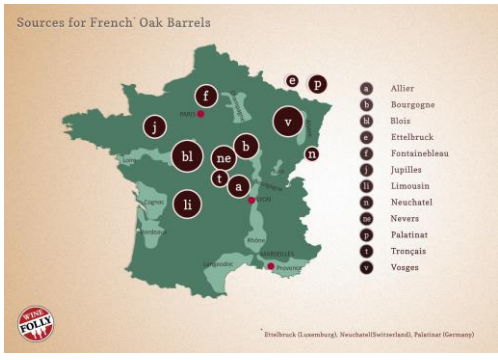
Benefits:
- Enhances fruit aromas
- Provides structure and mouthfeel without tannins, vanilla or toast.
- Costs about 10% less than French Oak
- Can provide a touch of color

- Detriment:
  - Dehydrates faster than oak
  - Costs more than American Oak

Oak: French vs. American



Oak: French vs. American



Oak: French vs. American

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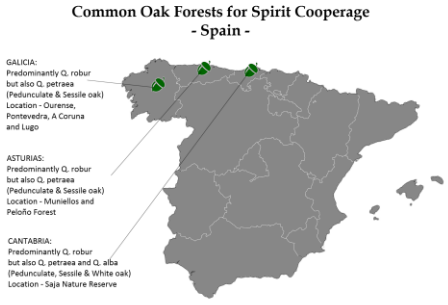
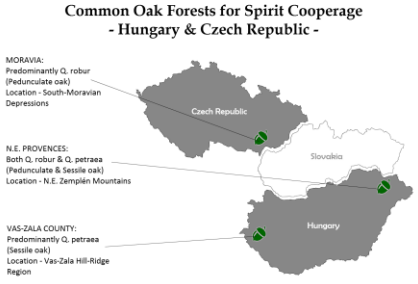
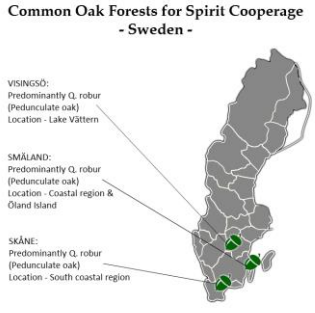


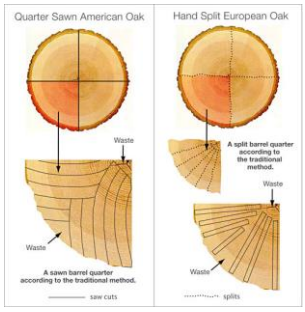
Oak: French vs. American



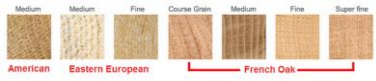
Oak: French vs. American



Oak: French vs. American



Oak French vs. American



Tight Grain: Aroma
- More Eugenol /Whiskey Lactones
- Wood & Spice aromas in later months

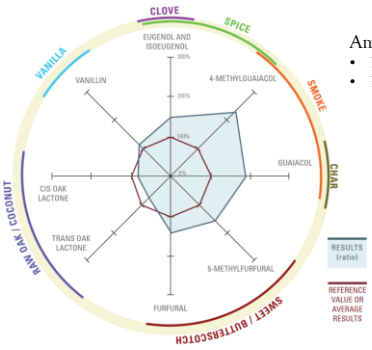
→ Long élevage
Volume
Texture
Wider Aroma Palate

Open Grain: Structure
- More Ellagitannins (wood tannins), faster
- More toasty / roasted aromas in early months

→ Shorter élevage
Or
Highly Tannic Juice

Marking the Barrels

Flavors from Barrels



American Oak
- More Flavor, Earlier
- More Tannin, Faster

J. Lohr Estates Seven Oaks Cabernet Sauvignon
- 12 months
- 22% New American Oak

J. Lohr Hilltop Cabernet Sauvignon
- 18 months
- 60% New French Oak

Seasoning Oak for Wine Barrels

Seasoning: up to 3 years

Chemical changes occur
- Ellagitannins reduced
- Coumarins reduced
- Eugenol and Vanillic Aldehydes increased

Toasting a Barrel

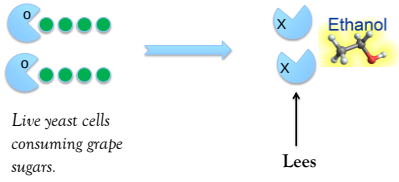
Toasting a Barrel

Natural Microoxygenation

20 to 40 mg O_2 per liter per year

- Color intensified
- Tannins polymerized
- Oxidize volatile sulfur

Lees



Live yeast cells consuming grape sugars.

Sur-lie aging = aged "on the lees"

Sur-lie Aging

- Dead yeast cells break down (Autolyze)

Release of:
- Mannoproteins
- Polysaccharides
- Amino acids
- Peptides

Result:
- Creamier Mouthfeel
- Protection from Oxidation
- Stabilization

Sur-lie Aging – in Barrels

Mannoproteins:
- Tannins, anthocyanins

Polysaccharides:
- Bind with free ellagic tannins

"Yield a sweetness":
- Lees bind with wood phenols and organic acids

Modified Oak Aromas
- Lees substances bind with vanillin, furfural, methyloctolactones

Lees Stirring

Bâtonnage

Barrel Sizes

Barrel Volume (liters)	Barrel Surface Area (cm^2/liter)
20	195
200	90
2000	42
10,000	24

Barrel (United states)	190 liters
Barrique (Bordelaise)	225 liters
Barrique (Bourgogne)	228 liters
Hogshead	300 liters
Botte (Italy)	400 liters
Butt (Sherry)	490 liters
Puncheon	475 liters
Fuder (Germany)	1000 litters

Barrel Sizes

Same wine needs 6 years in a 2000 liter barrel

Summary

- Wood / Cooperage selection
- Preparation choices
- Tannin / Flavor Contribution
- American vs. French
- Sur-lie Aging in barrels
- Size matters

Thank you!