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Can Varietal-Specific Barrels Make a Difference?

At Grape Beginnings, we believe it does!!

Today's coopers have embraced new technologies to produce the most specialized and refined barrels the wine industry has ever seen.

Aside from the wine grapes themselves, nothing influences the aroma and flavor of wine as much as oak barrels. The toasty aromas of Chardonnay, much of the spice found in Zinfandel, and clearly the cedar and tobacco notes in a fine Cabernet Sauvignon derive from oak wine barrels. Fine wine and oak barrels have historically been perfect marriage partners. For centuries, barrels have defined tradition. In fact no other symbol so succinctly represents the mystery and quality of fine wine as the oak barrel.

Modern-day commerce has changed the regal wine barrel. Today's custom barrels are no longer produced by crusty, bow-legged coopers relying on years of tradition and experience. Today's coopers have embraced new technologies and years of chemical analysis, and have blended them with their long tradition and are now producing the most refined, specialized, specific products the wine industry has ever seen.

Today's coopers tend to agree on several facts: the oak species plays a big part in selecting barrels; the wood should be aged a minimum of 18-24 months; grain types are a prime influence in the reaction between wine and barrel; and the toasting method and level of toast influence the barrel's effect on the wine more than any other factor.

"The cooper is at the service of the winemaker, but we must teach them. Winemakers used to think the wood breathed; wood doesn't breathe. There's a chemical reaction between the wine and the wood. That chemical reaction creates the aromas and flavors."

For winemakers, purchasing barrels no longer involves something as prosaic as simply selecting forests and toast levels. Today, winemakers can consult with research directors who study the chemical reactions between wood and wine, and measure the results and print colorful charts explaining what all the research means. They can design their own barrel-making methodology to provide specific aroma, flavor and tannic profiles. They can tailor-make their barrels to fit a grape varietal or even a specific vineyard.

Wine-Specific Barrels

Most recently, several companies have combined their research with selected specific wood types and modified technology to develop barrels designed for specific styles of both red and white wines.

Barrel profiling uses the latest sensors, a computer network and touch-screen monitoring to toast every barrel. The cooper simply inputs a barrel's wood specifications and desired toasting profile, then the computer directs the cooper to increase, decrease or maintain the barrel's current temperature to follow the desired profile.

Several of the barrel types that **Grape Beginnings** uses comes from **World Cooperage** which is located in Napa, California. Typically, World Cooperage asks a winemaker which varietal he is working with and to define his style. They present three or four toasting profiles to best achieve that goal. Winemakers must purchase a minimum of four barrels in each profile. After experimenting with the barrels, winemakers can adjust temperatures, grain types and toast levels to hone in on exact aroma and flavor components.

At certain temperatures you get different compounds, and they've been able to determine which temperatures give which compounds; and because of their computer system, they get repeatability. Every barrel run on your program comes out with the same flavors."

Grape Beginnings also uses **Kelvin Cooperage** Barrels, located in Louisville, Kentucky which is another cooperage that has been experimenting with specialized red and white wine barrels. Kelvin controls quality at the forest level by selecting tight-grain, slow growth American oak (*Quercus alba*) from Kentucky, Minnesota and Ohio. Minnesota oak is rapidly gaining in popularity for delivering more subtle characteristics than the traditional American oak barrel. Beginning in 2001 when they worked with four wineries in the Napa Valley area. The trials focused on Cabernet, Merlot, Chardonnay and Sauvignon Blanc. The wineries used sensory analysis to judge the effects of the barrels on the wine.

Their research indicated that tighter grain wood yields more aromas and less tannin along with slower extraction. Medium grain wood yields more tannic structure, less intense aroma and quicker extraction.

A cooper toasts a barrel with the aid of computer technology. The sensor that feeds data to the computer monitor aids the cooper in creating and replicating custom barrel profiles for white wines.

Their research also focused on the toasting of the wood. They begin with a pre-toast, using water and heat to create suppleness in the wood. Next is the actual toasting, which involves a constant and slow heating. The final stage is the *bousinage*, which incorporates a lid over the barrel to concentrate temperatures. It is this temperature spike that gives the barrel the majority of its aroma profile. **Kelvin's** American oak barrels use a short, intense *bousinage* while their Euro-Oak barrels lower the maximum temperature and extend the length of *bousinage*. **Kelvin** monitors temperatures during toasting with an infrared pyrometer with laser sighting and records the results to set up a database.

Evaluating a New Generation of Barrels

Whenever you are using oak barrels to produce Ultra-Premium wines, the aging and toasting of the wood are critical. Several molecules exist in freshly cut wood. Cis G-Octa Lactone is the dominant aroma of rough timber and smells of coconut. Vanillin expresses vanilla aroma. Eugenol gives the aroma of cloves. Ellagitannins are the tannins found naturally in the wood. Except for ellagitannins, aging raw wood appears to concentrate these aroma molecules. Toasting almost doubles the concentration. (Ellagitannins actually reduce when the wood is aged, and the longer the wood is toasted the more these ellagitannins are reduced.)

Of course, measuring these compounds as they develop in the wood aging or toasting process is one thing, translating that information into actual winemaking is another. Some sensory work has been done using a five-point scale, but that's not exactly based on formal sensory models. Something as simple as different alcohol levels from one vintage to another could have a major influence on these aroma compounds and their interaction with one another. The winemakers at **Grape Beginnings** bring their own expert tasting ability to bear when evaluating this new generation of barrels.

Our focus is on grain. Tight grain gives more aromas, less tannin and slower extraction. Medium grain gives fewer aromas but more tannic structure. Younger wood is more aromatic but also harsher. We no longer rely on toast level, but must also determine actual temperature and methodology; both influence which aroma and flavor molecules will develop.