The Impact of Oak During Wine Making

Over the past two weeks (as the grapes were harvested) we focussed on Creation’s Syrah – in the vineyard and also in the cellar. This week, as the young wine is transferred into oak barrels for maturation, we look at the impact of oak on the wine.

The impact of oak on the style of any wine is one of the key factors of production, and barrel choices made by Creation Wines’ cellarmaster JC Martin impact the final flavour profile and tannin structure of the wine. Oak influences different wines in many different ways and the winemaker’s job of selecting the correct barrel and then judging the correct application is an art in itself. Oak is the only permitted flavour altering additive, and one which forms an integral cog in the evolutionary mechanics of wine. As such, it deserves close attention.

Origin

There are three major barrel producing areas across the globe: France, the USA and Eastern Europe, and the origins of a barrel often hold important clues to its attributes.

French Oak (Quercus petraea/robur)

The craft of barrel-making was born in France, where the Gauls produced wooden storage vessels for wine known as ‘cupals’. The craftsmen who made them were ‘cuparius’, from which we get the modern word ‘cooper’ (although the earliest recorded use of wooden storage vessels far pre-dates Christian times). French oak is typically more porous and thus a wider array of flavours can be extracted – including spicier notes and there is also noticeably higher tannin content in French oak. Oak is sourced from state-owned forests at premium prices, and must be hand split with the grain, making for some of the most expensive barrels available, prized for their quality, imbued by the workmanship and nous of a trade that takes 7 years to master!
American Oak (Quercus alba)

American oak is structurally different from European oak and tends to be higher in wood sugars as well as flavour compounds responsible for vanilla and caramelised notes. The woods tend to be privately owned and lower priced, and the straight grain means it can be machine cut (as opposed to hand split as in France) – meaning a yield four times that of European oak.

Hungarian/Slovenian Oak (Quercus petraea)

Genetically similar to French oak, however slower growth means a tighter grain and less extraction, as well as lower tannins. The oak also reacts differently to the toasting process, producing a unique set of flavours. It is priced mid-way between French and American oak and is often used to add complexity.

Toasting

Toasting a barrel is the process of burning a wood fire in the centre of the oak staves, charring them. This process creates and releases certain desirable flavour compounds in the wood which are in turn
extracted by the wine during barrel maturation. Toast is measured from light to heavy and each level results in different flavours. Oak sourced from different areas and climates respond differently to the toasting process; to judge which level of toast will most benefit the character of an individual barrel the cooper uses experience, skill and intuition.

Size

Size plays a significant role in the way wine extracts flavour – the larger the barrel the higher the ratio of wine to extractable flavour compounds and thus the more subtle the perception of oak. The most common size is the 225-litre Bordeaux barrique, although the 300-litre hogshead has also become popular of late. 500-litre barrels are also common. Large wooden vats with a capacity of more than 1 000 litres are known as ‘foudres’ and can be used for many years.

New vs Old

When a barrel is filled with wine for the first time it is called a ‘first fill’, the second time it becomes ‘second fill’ and so on. The significance of this lies in the limited supply of extract available. The first fill of a barrel absorbs about 50% of the flavour and tannin in the barrel, the second fill 25% and then less each year as the barrel ages until it is merely a storage vessel, imparting little flavour. Often the winemaker will use a mix of barrels, perhaps 30% first fill as with the Creation Syrah, with the balance being made up of wines in second and third fill barrels. The wines from the different barrels will be pumped into large tanks and blended before bottling.

Aeration

Apart from imparting flavours, oak barrels are also uniquely suited to the slow aeration and maturation of young wines. The process of racking wine from one barrel to another, leaving any sediment behind, also oxygenates the wine. Oxygen is extremely important in the tannin development and integration as it allows tannin molecules to
polymerize and become less obtrusive, improving the mouth-feel of the wine.

Oxygen also interacts with certain flavour compounds to impart desirable aromas. The rate at which wine evaporates from barrels requires it to be topped up every couple of weeks, or there is a risk of too much oxygen which causes the wine to oxidise.

Barrel maturation is a vital process in the journey from grape to glass, and one which requires patience as our Syrah 2014 is about to find out. It will spend the next 14 months in the cool, slightly humid stillness of the 500-litre barrel maturation cellar, visible through glass inserts in the floor as you enter the tasting room at Creation as a neat collection of French oak barriques, stacked four high. During their stay they will switch barrels three times, each time becoming clearer and approaching readiness to drink as they leave sediment behind and develop rich aromas and supple structures.