Cape Mentelle Vineyards’ Approach to Tannin Management in Cabernet Sauvignon

JOHN DURHAM
Winemaker, Cape Mentelle Vineyard

In the past, you would have to say that if there were any place for artistic interpretation in the winemaking procedure then it would have to be in the area of phenolic management. The winemaking objective has always been, to put it simply, to achieve the right tannin texture and concentration according to the desired style one is striving for. However, we are dealing with a multitude of different phenolic compounds from different sources that are continually appearing, transforming, condensing and even disappearing during barrel and bottle maturation.

Hence, achieving the desired phenolic balance is not as simple as, for example, choosing the desired acid or alcohol level, which is a numbers game, based on simple laboratory analysis. To analyse phenolics, we need to rely more upon our palate and eyes which, if well calibrated, are fast and accurate detection instruments. They are also quite transportable, to wherever we choose to assess each batch. It is currently uncertain whether laboratory analysis will ever give as meaningful results for a winemaker to act upon.

The fruit for our Cabernet Sauvignon comes solely from a single vineyard planted 26 years ago. The wine from this vineyard has been bottled separately since 1975 and this experience has been useful in providing an understanding of our vineyard, the fruit, the effect time has on wine tannins and how our management techniques influence the outcome.

Our management plan for handling the fruit from this vineyard has evolved over the years, as has our concept of style. Margaret River is still a young area in viticultural terms, so it has been necessary to build a database of experience that takes into account the way wine tannins transform with time, the way grape tannins change with ripening and how grape maturity is affected by vineyard management practices and the vineyard meso- and micro-climate. We also try to maintain a flexible approach in our handling methods to account for the capricious nature of vintage conditions.

The following is a detailed outline of our approach to phenolic management, with some observations that influence our process.

Phenolic ripeness and the health of the fruit dictates cap management and the length of post-fermentation maceration.

Phenolic ripeness is measured by the taste of tannins in the skin, the ratio of berry skin to pulp and the extent of lignification of the bunch stalk and shoots. At Cape Mentelle Vineyards, we try to describe the way the tannins affect the palate by using terms such as ‘powdery’, ‘chalky’ and ‘bitter’. We feel these three terms best indicate the extent of tannin ripeness, any negative impact on the palate and how we are going to deal with tannins during the course of vinification.

We have found that perfectly ripened grapes will be difficult to over extract and become bitter. Vintages with cool, sunny and dry conditions yield the necessary environment for moderate sugar accumulation in the berry and consequently a longer period under the sun before harvest to mollify the tannins. Our objective is to achieve ripe flavours and supple tannins without excessive alcohol.

Canopy exposure, crop load, leaf area and vine health, together with the extent of ideal ripening weather, will determine the duration of veraison and the rate and degree of physiological ripeness (a term that describes the evolution of sugar, flavour and tannin in the grape). In a perfect year, and a perfect vineyard, all three components arrive at a single point of harmony on the day of harvest (Figure 1).

The limiting factor for sugar accumulation in Margaret River’s mild climate is water. Irrigation allows the late ripening Cabernet vine to maintain green leaves for photosynthesis during our typically dry autumn weather.

Observations during the 1994 vintage, when a severe rust mite infestation on the leaves in late autumn slowed down sugar accumulation, were that the tannin impression in the fruit was remarkably soft. We are currently speculating that, by manipulating the leaf area to achieve balance with the crop level and the prevailing vintage weather, photosynthesis could be slowed so that tannin evolution is extended. Balance is the key word however. Any leaf removal would require a deft touch, owing to the unpredictable nature of sunlight hours, rainfall and temperature post veraison that govern both the rate of photosynthesis and tannin ripeness.

It has also been our observation that the phenolics in the fruit of our old vines have a more supple, powdery texture than fruit from more recently planted vineyards. This may be the result of a more balanced canopy and root system in the older vines, and hence a more even light distribution throughout the fruiting zone, but other factors could also be involved and may be areas for further research.

We machine harvest our Cabernet which has a bonus of leaving the stalks on the vine, minimising the extraction of stalk bitterness during crushing. We also encourage many whole berries in the ferment by widening the rollers on the crusher. We surmise that, where the skins are not broken, phenolic extraction from the seeds is lessened, an advantage for a wine that is to undergo extended maceration.

The red must is transferred by 10 cm open throat rotary screw pump to 10,000 litre, closed fermenters which are temperature controlled. Sulfur dioxide is added at a rate of 20 mg/L at this stage. Low levels are used to avoid increased extraction of bitterness. Our fermenters are closed and basi-
cally square to maximise cap surface area to wine and minimise temperature fluctuations.

Inoculation takes place between 24 and 36 hours. Fermentation temperature usually peaks at 31°C within the third day of inoculation and then is held at 25°C during the rest of the ferment. Our reds receive two aerative pump-overs per day during the exponential phase of the ferment, with nitrogen supplement and acid correction also made during this period.

Most of the pumping over is done in the early part of ferment, with a quarter of the total pump-over time done prior to inoculation. In this way we achieve good colour extraction without excessive heat and/or alcohol extracting bitter tannins. Cabernet readily gives up its colour, despite the uneven nature of tannin extraction associated with pumping over. The duration and number of the rest of the pump-overs is determined by the harvest date, vineyard history, the depth of hue in the skin, the ratio of skin to juice, extent of stem lignification and, of course, the palate impression of tannin during the course of the ferment. However, we are finding better results in wines that have received less frequent and gentler pumping over than with our previous ‘fire hose working-over technique’ of the cap. These wines taste less extracted, but with a more evenly textured palate and, surprisingly, a more perfumed nose. You could draw a comparison, I suppose, with making a pot of tea—the sooner you pour a cup the more fragrant and less bitter the cuppa. We have concluded that, during this cap management phase, there is an inverse relationship between palate structure and wine aromatics.

The duration of post-fermentation skin maceration is dependent upon the health of the fruit, the future of the particular batch and presence of pomace-related and/or bitter elements. We believe that palate weight is enriched, and with time the tannin texture softened, if the wine is stored in new oak. This softening process takes anything from two to five years, depending on the vintage and the extent of new oak in the blend.

When the wine is ready for pressing, we use gravity to transfer the skins to the press, mindful of excessive extraction of the skins, particularly after extended maceration. We use an old Willmes air bag press. Pressings are kept separate but the decision on when to cut is clouded sometimes by the presence of yeast in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the presence of yeast in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the presence of yeast in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste. It is hard to gauge what extent the protein fraction in the press wine, which is bitter to taste.

In closing, I would like to emphasise the point that the greatest challenge for a winemaker is assessing the correct approach for each individual batch of fruit that arrives at the winery door; to tailor the winemaking precisely, so as to coax the best from the fruit while keeping true to the winery's style.

Every vintage presents a new set of parameters to be understood. These include the response of each vineyard to the vintage conditions, the intensity of fruit flavour, the variations of phenolic and protein concentrations in the must and the effect that fermentation and maturation have on the concentration and type of phenolics. Nor should the barrel supplier, who is no doubt subject to 'vintage' variation, be ignored.

In assessing the correct winemaking approach to managing phenolics, either hard facts need to be established at the outset, with phenolic analysis at every significant point of vinification that has the capacity to influence the wine's taste, or a more preferable way is to garner a thorough understanding of our vineyards, including the effects the meso- and microclimate have on phenolic concentration, and develop a bank of experience in dealing with a range of differing vintage conditions. Couple these observations with regular, well-documented tastings and we should be well equipped to manage our tannins to achieve the desired wine style.