Vineyard Influences on Grape Tannins

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Introduction
This presentation discusses some of the vineyard factors that can influence grape tannins. As will be seen, most factors relate to achieving ripe fruit and therefore the required riper, softer tannins.

It needs to be emphasised that most of what is presented are observations from a previous employment. In that role there was opportunity to compare vineyards and wines from all around Australia and there are certainly some interesting differences that relate to phenolic content and character. However, the following comments are not backed up with any scientific data and are really only thoughts as to what might be happening. More research is encouraged in these areas.

Irrigation
The first area to consider is the MIA problem, which appears to be related to irrigation technique. The problem is that the colour of red wines from the MIA region in NSW appears to develop at a much quicker rate than that of wines from their comparable regions, the SA Riverland and Victorian Sunraysia. On the vine, the fruit looks and tastes similar, but the fermented wine rarely seems to achieve the colour depth and hue that other regions' reds do. On top of this, after MLF completion and the first major SO2 addition, the colour deteriorates quite dramatically and the wine appears to be prematurely developed.

This may in some way be linked to the extensive use of flood irrigation in the MIA, which is not so common in the other regions. The reason for the link to irrigation is that very good results, in terms of red wine quality, are coming from the work on RDI (regulated deficit irrigation). In the SA Riverland there has been a dramatic improvement in the colour and phenolics of wines from grapes grown using this modified irrigation scheduling.

The concept has now been extended to other viticultural regions and should be a part of any vineyard management program. What RDI is providing is a red wine with a deeper, more attractive colour and increased phenolics and tannin structure, which is more suited to further barrel maturation and at the end of the day, capable of achieving a higher bottle price.

Canopy management
Moving onto canopy management, it seems that the best results in terms of colour and phenolics are coming from more open canopies and even where the berries are quite exposed to direct sunlight. This is particularly important in some of the newer and cooler vineyard regions that are being developed, where the vines can struggle to reach 13°Baume unless vine vigour is controlled and the canopy is opened up to let the sunshine in. Minimal pruning in particular seems to be a technique that needs to be managed carefully to achieve a desirable result, because the huge canopies it can produce can also result in poor colour and phenolics.

Nutrition
Nutrition and fertilisation are possibly related to canopy management, but basically the wines richest in phenolics and colour never seem to come off the best looking vineyards. Those vineyards which are given an abundant supply of nitrogen can grow nice looking vines with healthy, green leaves but the fruit often doesn't have the tannin structure and intensity required.

Yield
Obviously yield does have an influence on the colour and phenolic composition of red wines, but I don't think it is necessarily as direct as one might imagine. I have seen some quite large, leafy canopies with relatively moderate yields produce nothing spectacular in terms of phenolics and tannin structure, yet moderately high yields on a reasonably exposed vine canopy might produce very good colour and phenolics.

More important is the balance between canopy and yield and the amount of berry exposure.

Site
Finally, and probably most importantly, is the actual vineyard site's influence on the phenolic composition of the wine. All of the previously mentioned factors have an influence in terms of allowing the fruit to ripen easily to full maturity and optimising the amount of phenolics produced.

However, the climate and soil of the vineyard seem to have an effect on the type of phenolics and tannins that are produced. Although there is no scientific back-up, it is fascinating to taste Shiraz (for example) from all the different regions (made in a similar fashion) and appreciate not only the different flavoured wines but the different tannin textures each wine has.

Cooler more elevated vineyards like Eden Valley produce softer, more supple tannins than Barossa Valley's more intense, firmer, richer tannins. Then, Coonawarra produces a different style again, and Central Victoria yet another.

New emerging regions such as south western Australia and NSW Hilltops are introducing even more styles of tannin structure. Maybe, analytically, they are all the same type of phenolics, but perhaps they are not. Terroir may have an effect on the composition and/or balance of the phenolics, and that's what makes red winemaking so interesting.