What a Red Winemaker Should Know About Phenolics But Does Not!

ROBIN DAY  
International Wine Development Director, Pernod Ricard

Introduction
The following article aims to identify some of the questions that a winemaker should ask about phenolics. It does not seek to provide the answers.

First, why are definitive answers to such questions not known? One reason may be that winemakers believe that they do not need the answers. This luxurious state has probably resulted from the fact that Australian winemakers generally experience an abundance of colour and tannin. The tendency has been for Australian winemakers to make reds by the seat of their phenolic pants. An important spin-off from this has been an emphasis on the fermenting tank as a whole rather than a specific emphasis on the cap. If the phenolic background had been more challenging for Australian winemakers, a stronger emphasis on the cap would probably have resulted.

The cap is where the wine is being made. The rest of the tank is a reserve of partly made wine. This attitude, if strongly reinforced, leads to a redefinition of what a red wine actually is:

A red wine is an enduring record of the quality of cap management during fermentation.

Specific questions that remain largely unanswered

Grape maturity and phenolics
- What changes in the concentration and the nature of the skin tannins and anthocyanins occur during maturation?
- What are the varietal differences in anthocyanin and tannin levels, and how can fermentation handling be tailored to the needs of the variety?
- What is the influence of climate on tannins and anthocyanins?

Colour and tannin extraction from cap
- What are the key contributors to colour stability and, quantitatively, what is the role of oxygen and tannin?
- Why does dry maceration give progressive stabilisation of colour?
- What is the efficacy of different fermentation methods—pumping over, délestage and heading down?
- Can we identify more clearly the characteristics of extraction of tannin from seeds?

Exogenous tannins
- What are the characteristics of different types of tannins?
- Can we quantify the efficacy of different types in stabilising colour?
- Is exogenous tannin added at, for example, day two of a fermentation better than a dry maceration on green seeds?
- What is the desired role of exogenous tannin in post-fermentation handling?

Rotovats
- What are the implications of very rapid extraction of colour and tannin?
- What is the overall phenolic impact of this departure from traditional fermenter technology?

Pressing
- Why does pressings quality increase upon going from a continuous small diameter press to a continuous large diameter press, a membrane press, and to clarified pressings?
- Solids content is one obvious answer to the point above, but why?

Cold stabilisation
- How much colour loss is there, why does it occur, and how can it be reduced?
- What are the changes in the levels of other phenolics during cold stabilising?
- What is the role of exogenous tannins at this stage of processing?

Conclusion
Answers to this list of questions would provide a scientific framework for much more intelligent red winemaking in the future. It needs to be recognised however that partial answers to a number of these questions exist in the literature. The first stage of a major thrust into phenolic research is therefore to assemble a comprehensive literature review that should highlight deficiencies in knowledge very clearly. A major benefit to practising winemakers would result from publication of a 'plainer English literature review'.

ASVO Seminar • Phenolics and Extraction