Specifying Grape Flavour

RUSSELL JOHNSTONE
Orlando Wyndham Group Pty Ltd, PO Box 943, Rowland Flat, SA

Introduction

In a discussion on quality, Holbrook and Corfman (1985) suggest that, for products, two dimensions of quality may be considered. These are:

- product reliability and freedom from defects; and,
- intrinsic attributes that may be measured and occur in the finished product as a result of great deal of care and attention in its manufacture.

For the purposes of this discussion, the latter dimensions of wine flavour and colour will be discussed.

Traditionally winemakers waited to see how a wine turns out before ascribing it a quality rating. In modern winemaking, the winemaker will batch grapes together to form large parcels of wine, means of assessing the potential of a batch of grapes before harvest have become necessary. In order to purchase grapes more efficiently it has become important to provide guidelines on what kind of grapes are required from the winemaker. The term 'winegrower' is used in the belief that Australian grape growers must consider themselves as the producers of wine rather than grapes.

This paper will discuss the elements that have an effect on the composition of those grapes and describes two approaches that may be made to specifying this by either providing the winegrower a recipe or, providing the winegrower with a set of specifications to aim at.

Elements that influence flavour

An approach to specifying flavour and colour in wine is to gain an understanding of those elements that may have some influence on the flavour of wine grapes that are vineyard based. Once this understanding is gained it may then be possible to repeat these elements and use them as a prescription for future success in the production of wine grapes.

When a vineyard is planted, several variables available to the viticulturist to manipulate flavour may be considered as fixed. These are the genetic make up of the vines and the environment of the vineyard. The genetic make up of the vines planted will have a major influence on the flavour of the wine grapes produced (Winkler et al. 1974, Schreier 1979, Allen and Lacey 1993, Jackson and Lombard 1993). The influence that clone may have is less apparent and therefore may therefore continue to have some place in the pricing of grapes.

Perhaps the most readily apparent influence on flavour over which we may have some control is harvest date. There are considerable changes in composition that occur through the period of ripening (Coome and Iland 1987, Allen et al. 1996). The relationship between ripening and the development of colour may be seen in Figure 1. These data relate to vineyards from a range of regions as previously reported (Johnstone et al. 1996) and indicate that there may be large changes of wine colour for small changes in ripeness. It is conceivable that there will be similarly large changes of flavour given the strong relationship between colour and flavour (Jackson et al. 1978). This relationship between ripeness and final wine colour (see Figure 2) varies from district to district. These data indicate that region influences are important and may therefore continue to have some place in the pricing of grapes.

![Figure 1. Effect of total soluble solids on wine colour.](image-url)
Prescription vs specification
There are two approaches that may be valid in working with winegrowers in the sourcing of winegrapes. These may be termed:

• the prescription approach: the rules are clearly laid out as to how the winegrapes may be grown with a particular end point in mind; or,

• the specification approach: provides some clearly defined and easily measurable parameters that must be met when the grapes are delivered for winemaking purposes.

The rules applied by the Institut National d’Origine des Vins et Eaux de Vie (INAO) in Chateau Neuf du Pape are an example of the prescription approach. There, winegrowers are required to goblet or ‘bush’ prune 12 of the 13 permitted varieties; the exception, Shiraz, may be trellised.

To tell the winegrower what is required as a specification or a clearly described set of goals is an alternative to telling a winegrower how to produce winegrapes for a particular purpose. The parameters of the specification should be objective and measurable, and the measurement repeatable, rapid, robust, convenient and relatively cheap. A bove all the specification must be easily understood by the producer.

Complex methods are required for the analysis of flavour in winegrapes. Intricate extraction procedures or headspace analysis are required to isolate volatiles. Final determination of these volatiles requires further procedures; for example gas liquid chromatography coupled with mass spectrometry (Williams and Allen 1995). Currently, the direct specification of flavour in the vineyard for winemaking purposes is impractical. For the future, we will need indirect methods of determining the flavour composition in a batch of winegrapes.

Given the strong relationship between ripeness, as measured by Total Soluble Solids (TSS) and colour for Shiraz, a simple starting point for a specification that meets the above criteria is to specify TSS. Such a specification may be structured with a minimum acceptable TSS below which penalties are applied in line with market prices or the grapes are rejected. The base price may be applied to the minimum acceptable TSS and the penalties applied as a percentage or proportion of this price. A n ideal range may be described with incentives paid for grapes that are of higher TSS up to the maximum of this range. Grapes delivered above this maximum TSS may not receive a greater reward and indeed a penalty may be applied in line with market prices or the grapes are rejected.

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Feedback to the winegrower
Feedback on outcomes is critical to the maintenance of the relationship with the winegrower. Details of the composition of the grapes delivered and the appropriate rewards or penalties must be provided to the winegrower in a timely way. This communication must be clear, unequivocal and fair.

The outcome of such a scheme may be quite rewarding. When the deliveries of grapes made are of similar TSS, controlling ripeness enables useful comparison between blocks for other parameters such as total wine colour. Note that in Figure 2 there are wide variations of colour for the same TSS between regions. This suggests that colour may be a worthwhile parameter to incorporate in a scheme to specify flavour.

Importantly, the application of this specification may also provide an internal as well as external discipline.

Vineyard variability
An unexpected outcome of recording TSS in order to apply this approach is the extent of within vineyard variability that becomes evident. The graph (Figure 4) shows that for a load of approximately 100 tonnes of Shiraz, the range of TSS may be plus or minus one Baume. The mean TSS for the block contributing to this wine may be apparently acceptable at 12.5°Baume, however the wine made may have poor colour and its flavour will be influenced by the extremes of under and over ripe grapes. This graph also indicates the difficulty that a sampler may have in collecting a representative grape sample from such a vineyard.

A nother specification that may be considered is that of rewarding winegrowers based on berry weight. Figure 3 shows that this may be a valid approach; the smaller the berry weight, the greater the total phenolics present in the resultant wines. This measure may fail the criteria for a specification as berry weight is often difficult to assess.

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An unexpected outcome of recording TSS in order to apply this approach is the extent of within vineyard variability that becomes evident. The graph (Figure 4) shows that for a load of approximately 100 tonnes of Shiraz, the range of TSS may be plus or minus one Baume. The mean TSS for the block contributing to this wine may be apparently acceptable at 12.5°Baume, however the wine made may have poor colour and its flavour will be influenced by the extremes of under and over ripe grapes. This graph also indicates the difficulty that a sampler may have in collecting a representative grape sample from such a vineyard.

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Summary
The challenge for wine producers who purchase grapes is to develop clear guidelines for winegrowers in the form of prescriptions and specifications.

Bibliography