Technical notes

Understanding and targeting Australian Pinot G styles

Pinot Gris/Grigio (or Pinot G for short) is best known for the rich, luscious wines produced in the Alsace region of France (labelled Pinot Gris), and for the crisp zesty wines produced in northern Italy (labelled Pinot Grigio). Over recent years in Australia, increased plantings have seen this variety move from alternative status into the mainstream, where it is now the sixth largest volume white variety.

Since late 2007, the AWRI's Industry Applications team has been working with several leading Pinot G producers on a project which aims to understand the variety and the styles of wines produced from it. The project's primary outcome has been the development of the Pinot G Style Spectrum – a label graphic that communicates to consumers the style of Pinot G wine in the bottle, using a 0 to 10 scale from Crisp to Luscious.

Figure 1. Example of a Pinot G Style Spectrum label graphic (indicating a wine with a rating of three on the ten-point scale)

The rating is based on a sensory panel's overall impression of the style of the wine, incorporating attributes such as its acidity level, sweetness, fruit flavour intensity, viscosity, palate weight and bitterness. A rapid method has also been developed to predict Pinot G Style Spectrum scores based on spectral analysis in the mid infrared region. During 2010, the Pinot G Style Spectrum label was trialled on a small number of Pinot G products from our industry partners. For 2011 vintage wines, access to the Spectrum is being opened up to wineries within Australia and internationally, and we expect to see it on at least 800,000 units by the end of the year.

As a spin-off from the main goal of developing this communication tool, we have gathered chemical, spectral and sensory data on more than 100 Australian Pinot G wines, giving us a unique insight into what Australian producers are doing with this variety. So, what have we learnt about Australian Pinot G styles? And how can winemakers use this knowledge if they wish to target a particular style?

Australian Pinot G wines

The wines in the dataset can be characterised as follows:

- 119 wines from vintages 2006–2010, with 70% from the 2009 and 2010 vintages
- 74 labelled Pinot Grigio, 45 labelled Pinot Gris
- from regions across Australia including Mornington Peninsula, Adelaide Hills, Tasmania, King Valley, Granite Belt, Clare Valley, plus multi-region blends.

The data obtained for this set of wines is summarised in Table 1.

Table 1. Summary of chemical, spectral and sensory data for 119 Australian Pinot G wines

	Mean	sd	Median	Minimum	Maximum
Alcohol (% v/v)	12.8	0.9	12.8	10.7	14.9
Glucose+Fructose (G+F)[1] (g/L)	2.9	2.0	2.8	0.2	9.2
pH	3.27	0.14	3.26	2.95	3.69
Volatile Acidity as Acetic acid (VA) (g/L)	0.30	0.07	0.30	0.16	0.50
Titratable Acidity (TA), pH 8.2 (g/L)	5.97	0.6	6.00	4.10	7.90
A280 (phenolics)	0.1257	0.031	0.1239	0.0769	0.2675
A420 (yellow/brown colour)	0.0095	0.007	0.0085	0.0027	0.0579
Pinot G Style Spectrum score (0 to 10)	4.4	1.5	4.4	1.5	8.7

[1]Note that only wines with G+F< 10 g/L were included in our dataset

Distribution of styles

Looking at the distribution of Pinot G Style Spectrum scores in Figure 2 shows that the majority of the Australian Pinot G wines in the dataset have styles around the middle of the
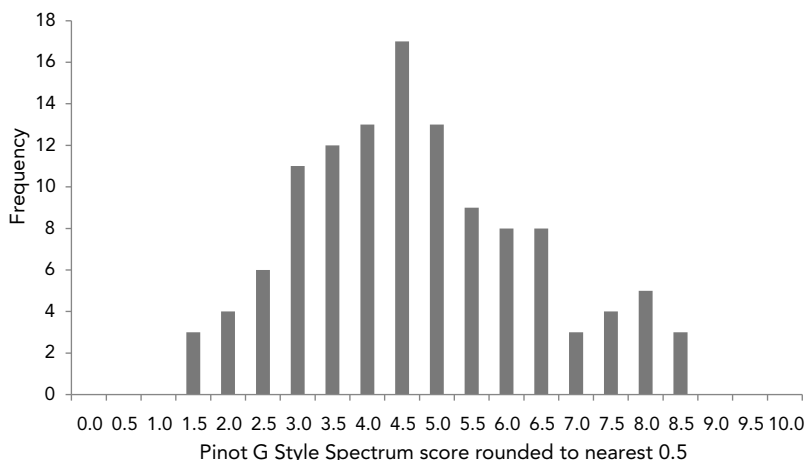
Figure 2. Distribution of Pinot G Style Spectrum scores for 119 Australian Pinot G wines

spectrum, with 4.5 the most common score, closely followed by 4.0 and 5.0. No wines were found with rounded scores below 1.5 or above 8.5. This suggests that Australian styles of Pinot G tend less to be made at the stylistic extremes, and instead have some degree of both crisp and luscious attributes in varying proportion.

What influences style?

An important part of the project has been to try to understand which wine characteristics have the greatest influence on perceptions of Pinot G style. Such understanding could then assist winemakers to tailor their decision-making if they wished to send their wines in a particular stylistic direction.

In the early stages of the project we performed extensive chemical analyses on a set of wines that had also undergone formal sensory assessment. We then carefully examined the data to look for correlations with the Pinot G Style Spectrum score. In addition to the standard wine compositional analytes (pH, TA, VA, residual sugar, alcohol), we also scanned the wines to obtain their mid infrared spectra and measured the concentrations of organic acids and glycerol. For predicting the Pinot G Style Spectrum score, data analysis revealed that five simple measures, in combination, could account for most of the variation. These five measures were:

> Alcohol
> Glucose + Fructose
> Volatile Acidity (VA)
> Absorbance at 280nm (A280 – a measure of phenolics)
> Titratable Acidity (TA)

For the first four attributes listed (alcohol, sugar, VA and phenolics), higher values tended to be associated with higher Pinot G Style Spectrum scores, i.e. wines deemed to demonstrate greater 'lusciousness'; and lower values with wines which were rated as 'crisper'. Not surprisingly, for TA the association was reversed; wines with higher TA tended to be rated as crisper and less luscious than lower TA wines, and also received lower style spectrum scores.

Another way to think about this is to look at some specific examples of actual Australian wines from different parts of the spectrum (Table 2).

These examples demonstrate the way these five attributes can combine to influence the overall perceived style and also give some interesting examples of the different approaches being taken to working with this one variety. Of course, these numbers are by no means meant as

a recipe for one style or the other, and they don't even scratch the surface of the viticultural and winemaking inputs which contribute to a wine's final style.

Table 2. Five examples of Australian Pinot G wines from different parts of the Pinot G Style Spectrum

	Pinot G Style Spectrum score	Alcohol (%)	Glucose + Fructose (g/L)	pH	Titratable Acidity, pH 8.2 (TA) (g/L)	Volatile Acidity as acetic acid (VA) (g/L)	A280 (phenolics)
'Crisp' example - 2010 Mornington Peninsula	2.0	12.3	0.5	3.24	7.1	0.30	0.119
'Crisp' example -2009 Adelaide Hills	2.0	12.0	0.4	2.98	7.7	0.19	0.091
'Intermediate' example - 2010 King Valley	5.0	12.9	2.8	3.28	6.0	0.33	0.148
'Luscious' example - 2010 Mornington Peninsula	7.5	14.5	6.0	3.51	5.6	0.44	0.130
'Luscious' example - 2009 Adelaide Hills	7.5	12.9	3.0	3.43	5.7	0.38	0.160

What if I want to change the style of my wine?

Having identified the five attributes which influence most strongly Pinot G wine style, it makes sense that any winemaking decisions that affect those attributes are likely also to affect the final wine style. The most obvious first decision is picking date. Earlier picked grapes are more likely to result in wines with lower alcohol and sugar, and higher TA, i.e. wines more on the crisp end of the spectrum. Conversely, later picked grapes are likely to result in more luscious wines. This meshes with what is known about traditional European Gris/Grigio styles, where the lighter northern Italian wines are generally made from early picked grapes and the richer Alsatian wines are made from later picked grapes. Decisions on acid additions, skin contact, fining options and residual sugar levels are all additional areas where winemakers have the ability to influence final Pinot G style.

Taking fingerprints

The fact that we have been able to predict wine style scores using MIR spectral data raises some exciting future possibilities. Spectral 'fingerprints', possibly correlated and combined with conventional compositional data, could be used as targets of wine style. Fingerprinting might then be used during production to assess the propensity of viticultural and winemaking techniques to move the style of a wine towards those style targets. Importantly, such technology is not designed to replace the human palate or to make all Pinot G wines 'taste

the same'; in fact quite the opposite. Structured sensory evaluation, as used in the Pinot G project, is crucial in defining style targets.

The greater understanding of what defines wine style gained through this project will have benefits for both consumers and producers. As more bottles are labelled with the Pinot G Style Spectrum, consumers can feel more confident about buying the styles of wine they want. At the same time, producers will more easily be able to differentiate their wines, and to make wines which fit identified market niches.

For more information, visit www.pinotG.com.au or if you are interested in having your wine classified on the Pinot G Style Spectrum, please contact the AWRI on PinotGstylespectrum@awri.com.au or 08 8313 6600.

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