

Understanding and using results from the AWRI Tannin Portal

Phenolics

Phenolics are a chemically diverse, important class of wine molecules that impact on the colour and taste of red wine. Three different phenolic ‘classes’ can be measured using the AWRI Tannin Portal:

Total phenolics is a measure of all coloured and non-coloured phenolic molecules originating from grape skin, flesh and seed. Total phenolics concentration is reported in absorbance units (a.u.).

Tannins are a sub-class of total phenolics, characterised by their ability to precipitate proteins. Grape tannins are present in both the seeds and skins of grapes. When grapes are crushed, these tannins begin to be extracted from the skins and seeds into the grape must. Those from skins tend to be more easily extracted than those from seeds. Once extracted, the grape tannins begin to chemically rearrange, turning into wine tannins, which can be significantly different in composition from the original grape tannins. Tannin concentration is reported in g/L epicatechin equivalents.

Total pigment in wine is a measure of total red colour in the sample. It is reported in absorbance units (a.u.). Total pigment is predominantly made up of **free anthocyanins** and **pigmented tannins**, both of which can also be calculated using the Tannin Portal. However, there are other pigmented compounds present in red wines, so total pigment is not necessarily the sum of free anthocyanins and pigmented tannin.

Free anthocyanins are highly coloured compounds responsible for the colour of red grapes. They are found in grape must, ferments and young wines, but are not very stable under wine conditions so their contribution to wine colour decreases quite rapidly as a wine ages.

Pigmented tannins are stable coloured compounds formed through the reaction of anthocyanins with tannins during fermentation and wine storage. Pigmented tannins have been shown to contribute up to 90% of the colour of red wine after two years’ storage.



Measuring tannins

Tannins can be measured in the lab by precipitating them out of wine, using wet chemistry methods. The AWRI Tannin Portal provides an easier way to measure tannins using UV-Vis absorbances and a spectral calibration maintained by the AWRI. Additionally, the Tannin Portal contains a database of over 6000 red wine samples to help provide context for your measurements and enable you to benchmark your wines.

Why are tannins important?

Tannins are responsible for the majority of astringency in red wines, and tannin concentration relates fairly linearly to astringency. Descriptors beyond overall astringency (e.g. silky, chalky, grippy) are not necessarily explained by tannin concentration alone, but likely by contributions from other components in the wine matrix like polysaccharides, sugars, flavour compounds, glycerol, acid and alcohol. Tannins also play an important role in red wine colour by reacting with anthocyanins (relatively unstable coloured molecules), to form more stable coloured compounds (pigmented tannins).

How to use the numbers?

Total phenolics and tannins are the next most abundant classes of molecules in dry red wine after water, alcohol, organic acids and glycerol. Knowing the tannin, total phenolics or pigment concentration during a ferment or after a wine is pressed can help support decision-making and tasting in many ways including:

Ferment management – accurate perception of astringency can be difficult in the presence of sugar, so having an objective measure is important. If you know that tannin is extracting slowly or quickly, decisions about managing the ferment can be made with greater confidence (e.g. cap treatment, temperature). This is also important because tannin extraction can influence colour stability.

Pressing decisions – historical experience or press fraction tasting can be supported through measurement of tannin, total phenolics or colour (pigment) concentration.

Blending decisions – from knowledge of historical tannin, total phenolics and colour concentrations of your product range you can aim for consistency with the previous year's product or perhaps a product that best expresses the style you want for this vintage.

Consumer preferences – consumer preference is influenced by tannin and colour, so knowledge of the wine styles preferred by different segments of consumers and how these can be achieved through informed winemaking can be invaluable.

Climate change – weather affects tannin, total phenolics and colour concentration in fruit and with increasing variability in weather, data on how weather influences wines made from your particular environment may be built up over time by monitoring tannin, total phenolics and colour concentrations.



Where can I find out more?

For more information on the relevance or application of phenolics or tannin measurements, please contact us.

Phone 08 8303 6600

Fax 08 8303 6601

Email tanninportal@awri.com.au

Website www.awri.com.au

Address Corner of Hartley Grove and Paratoo Road Urrbrae (Adelaide), South Australia 5064