

Export focus on residual metals

IN MARCH 2014, Wine Australia issued a warning to wine exporters regarding increased scrutiny of manganese, iron and copper levels in wine by Chinese authorities. Since then, the AWRI helpdesk has received a number of queries from grapegrowers and winemakers concerned about manganese in grapes and wine.

What is the Chinese regulation around manganese in wine and is it a concern?

The Chinese government has begun enforcing mandatory upper limits on residual manganese (2 mg/L) in wine as well as copper (1 mg/L) and iron (8 mg/L). Relatively little is known about typical manganese levels in wine and its sources. As of August 2014, the AWRI has analysed more than 2000 Australian and international wines for manganese. Some important trends in the data have been observed. First, a wide range of manganese levels is observed for both Australian and international wines, which may reflect the wide range of manganese levels in soils throughout the world. Second, about 25% of all wines analysed exceed the 2 mg/L limit, with higher average manganese levels seen in red than in white wine. This is likely due to the extraction process during the fermentation of red wine releasing more manganese from the grape skins and flesh. However, no significant differences are seen among varieties of red and white grapes. Initial studies do suggest average levels can change from vintage to vintage, perhaps due to changes in rainfall and other environmental conditions, and some regions are more prone to high levels than others.

My grape buyer is restricting the number of mancozeb applications I am permitted to use. What is the reason for this?

Mancozeb is the only active constituent registered in Australia with a manganese component. The winery may be concerned that the application of mancozeb would contribute to the manganese level in wine.

One published study from Sicily (La Pera et. al. 2008) found fungicide treatments with mancozeb did increase the level of manganese in wine. The wines treated with mancozeb in the study, however, did not exceed the Chinese maximum residue limit (MRL).

To understand the contribution of mancozeb to manganese levels in wine, the AWRI fermented grapes from the 2014 vintage with known mancozeb applications and analysed the resultant wines. No relationship was found between the number of mancozeb sprays and manganese levels seen in the wine and none of the 36 wines tested contained manganese in excess of 2 mg/L. Conversely, the AWRI has tested wines which exceeded the 2 mg/L limit which had not received any mancozeb treatments, suggesting other factors such as soil type may be more important.

If I meet the recommended withholding period for mancozeb use, will that ensure my wines are below the limit for manganese?

No. Withholding periods for mancozeb have not been developed with the aim of managing manganese content in grapes and wine. In any case, mancozeb sprays do not seem to be the main contributing factor to final manganese concentrations. Instead, soil and other environmental conditions are likely to have the greatest influence.

Are there any treatments available to remove manganese from wine?

The AWRI has tested a number of wine fining treatments



LAB TEST: An Atomic Absorption Spectrometer is used to analyse for manganese at the AWRI. Photo Eric Wilkes.

to see if they could remove manganese from wine. To date none has shown a satisfactory impact on reducing the level of manganese in wine. Some commercial operators are offering processing treatments to remove manganese from wine, but independent testing has not been conducted of these processes. Work at the AWRI is continuing to assess a range of possible processing and fining options.

How can I tell if my wine will meet the requirements?

The current recommendation is to test all wines destined for export to China for copper, iron and manganese.

How are samples analysed for manganese and other metals?

Wine and juice samples can be analysed for metals including manganese by Atomic Absorption Spectroscopy (AAS) or Inductively Coupled Plasma Spectroscopy (ICPS). AWRI Commercial Services and other Australian laboratories offer rapid analysis of metals in wine or juice. It's important to note that analysis of juice will not necessarily provide an accurate prediction of metal concentrations in final wine, due to concentration effects during the winemaking process. For this reason, finished wines should always be analysed before export.

Want to know more?

For more information, please contact Dr Eric Wilkes, Group Manager - Commercial Services, on eric.wilkes@awri.com.au, Creina Stockley, Health & Regulatory Information Manager on creina.stockley@awri.com.au or Steve Guy, General Manager, Regulatory Services, Australian Grape and Wine Authority on steve.guy@agwa.net.au.

Reference

La Pera, L., Dugo, G., Rando, R., Di Bella, G., Maisano, R., Salvo, F. (2008). Statistical study of the influence of fungicide treatments (mancozeb, zoxamide and copper oxychloride) on heavy metal concentrations in Sicilian red wine. Food Additives & Contaminants: Part A, 25(3), 302-313.