The Australian Wine Research Institute

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AWRI Report

Evaluation of Potassium Polyaspartate (KPA) as a Potassium Bitartrate Stabiliser in Wine

Executive Summary

The Australian Wine Research Institute (AWRI) was engaged by Enartis to carry out a performance assessment of potassium polyaspartate (KPA) as a means of achieving tartrate stability in wines. A series of physical and chemical tests were applied to a series of thirteen wines (eight whites, two rosés, and three reds) treated with Zenith® Uno KPA at a dose rate of 100 mL/hL. Wines were treated in duplicate and analysed at three intervals over a 6-month period alongside control (un-treated) wines. All wines were stored in cellar conditions (darkness at a temperature of approximately 15°C) between test points.

The thirteen wines incorporated into the trial were as follows:

Wine Sample	***Varietal***	***Region***
White_Wine_01	Riesling	Riverland (SA)
White_Wine_02	Chardonnay	Sonoma Valley (USA)
White_Wine_03	**Chardonnay**	**Riverina**
White_Wine_04	**Chardonnay**	**Murray-Darling (VIC)**
White_Wine_05	Sauvignon Blanc	Riverina (NSW)
White_Wine_06	Pinot Grigio	Barossa Valley (SA)
White_Wine_07	Semillon	Riverina (NSW)
White_Wine_08	**Chardonnay**	**Riverina (NSW)**
Rosé_Wine_01	Pinot Noir, Grenache, Mataro (Mourvèdre)	Barossa Valley (SA)
Rosé_Wine_02	Cabernet Sauvignon	Riverland (SA)
Red_Wine_01	Shiraz	Riverland (SA)
Red_Wine_02	Cabernet Sauvignon	Riverland (SA)
Red_Wine_03	Merlot	Riverina (NSW)

All white wines were heat stable, with the exception of White_Wine_05. The three Chardonnay wines highlighted above were subjected to elevated temperature, with samples held at 40°C for fourteen days immediately post-treatment, to ensure that the wines remained tartrate stable.

The tartrate stability was assessed using a cold hold analysis method where wine samples in sedimentation flasks were held at -4 °C for three days. After inspection for the presence of tartrate crystals, the flasks were subsequently chilled back to -4 °C until a total elapsed time of 20 days had passed, before re-checking for the presence of crystals.

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A conductivity based mini-contact stability method was also performed via an external laboratory, measuring the change in conductivity (ΔμS) post seeding with KHT at low temperature. The following criteria were used to determine tartrate stability of wine samples:

- ΔμS < 25, very stable
- 25 ≤ ΔμS < 40, stable
- 40 < ΔμS ≤ 60, at risk
- ΔμS > 60, unstable

Results of the cold hold tests showed that Zenith Uno increased the tartrate stability of all white, rosé, and red wines up to and including 6-months post-treatment. All treated samples were free from precipitate during cold hold testing, excluding one sample (White_Wine_07), which was found to have an extremely high calcium loading. Analysis showed that this precipitate consisted predominantly of calcium tartrate.

Mini-contact tests showed that no treated samples were 'unstable' other than White_Wine_07 and White_Wine_08. The 'unstable' mini contact result for White_Wine_07 may be linked to the high calcium loading. The unstable result in White_Wine_08 was not deemed to be of significance, as the treated wine did not produce a precipitate during the extended cold hold test. The cold hold tests are generally considered more reliable than mini-contact test methods.

The images below show some examples of the effectiveness of Zenith Uno in achieving tartrate stable wines, compared to the untreated control wines.

Untreated Control White

Uno Treated White

Untreated Control Rose

Uno Treated Rose

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