

RED FERMENTATION MANAGEMENT FOR GRAPES AFFECTED BY SMOKE TAINT

Smoke taint is the result of absorption of guaiacol, 4-methylguaiacol and a host of other compounds into the grape skins, vines and leaves. Wines that have been produced from smoke tainted grapes can have aroma descriptors such as ashy, burnt bacon, wet ashtray and campfire. Red wines tend to be more prone to smoke taint issues due to the prolonged skin contact during fermentation.

Smoke taint is present in the grape berry in the free volatile form and also bound as non volatile glycosylated conjugates (eg. guaiacol glycoconjugates), hence may not be detected by aroma assessment of grape juice alone. These bound precursors can be released into volatile components during and after fermentation.

There is no known total remedial action or product that can eliminate this taint, but there are some winemaking procedures or products that may help minimize the smoky character of finished wine.

The University of Adelaide completed and published an investigation – Ristic et al. 'The effect of winemaking techniques on the intensity of smoke taint in wine.' The Australian Journal of Grape and Wine Research, 2011.

- The study was undertaken to investigate the efficacy of various winemaking techniques in reducing the intensity of smoke-related attributes whilst maintaining acceptable wine quality. The varieties included Grenache and Shiraz.
- Previous studies have shown that guaiacol and guaiacol glycoconjugates accumulate preferentially in the skins, so winemaking techniques that minimize skin contact should reduce the extraction, therefore the intensity of smoke taint in finished wines.
- Given that guaiacol glycoconjugate pool remained in the wines after fermentation, it is likely that guaiacol (and thus smoke taint) will continue to evolve slowly in the bottle with age.
- Quantification of guaiacol glycoconjugates in wine highlighted Lalvin ICV GRE™ as the only yeast where high precursor levels did not correspond to high guaiacol levels and Lalvin ICV GRE™ was the preferred yeast for the expression of different wine parameters.
- The sensory results suggest the addition of oak or tannin additives can reduce the intensity of smoke taint, albeit through increased wine complexity rather than a reduction in the concentration of smoke-derived phenols.

The AWRI have various pieces of information on their website, in particular information related to the vineyard. The AWRI suggest performing a small lot ferment, conducted 2-3 weeks before official harvest to assess the grapes for smoke taint. Visit www.awri.com.au, and the method is found under : Small-Lot Fermentation Method.

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1. SO₂ management at fermentation.

As long as the fruit is not compromised, follow your standard SO₂ protocol.

2. Enzymes – most of the smoky character is found in the grape skins so skin contact should be as brief as possible.

Use Lallzyme EX™ (30g/tonne of grapes) at grape reception to maximize expedient pigment extraction. Allow 8 -12 hours of contact time with enzymes before adding any fermentation tannins.

3. Fermentation Tannins – Use of these may help build structure quickly.

Scott'TAN FT Rouge™ or Scott'TAN ColorMax™ (25 -300ppm), added half at the crusher and the balance at the 1st or 2nd pumpover. Do not work the grapes too much. The enzyme will increase extraction.

4. Yeast selection – Choose a yeast that increases fruit expression and build mouthfeel at 250ppm. Please visit www.lallemandwine.com for more information on the yeast characteristics.

Lalvin Clos™ – Respects varietal character, adds complexity and minerality.

IOC R9008™ – This yeast produces high levels of glycerol contributing to a round palate. Helps to decrease herbaceous character.

Lalvin ICV D21™ – Contributes to a good mid-palate tannin structure with good colour stability. Releases polysaccharides that help stabilize aromatic molecules and soften hard tannins.

Lalvin ICV GRE™ – **MOST RECOMMENDED**. This yeast tends to favour upfront expression of fruity aromatics. It produces a high level of glycerol so contributes a round palate structure. It can also reduce herbaceous characters in fruit picked before optimal ripeness. Suited to early drinking style of red wine.

5. Detoxification.

Nutrient Vit End™ is a specific inactivated yeast that has high bio-absorptive properties. Whether this product can absorb these smoke taints is unknown, but could be considered as an option given its highly absorptive properties.

6. Fermentation nutrients - Good fermentation nutrition management is always recommended to produce optimal fruit expression and reliable fermentation.

GoFerm™ Protect Evolution, a yeast rehydration product, provides the yeast with sterols, vitamins and minerals. Essential survival factors contribute to clean, smooth and complete fermentation.

Fermaid® AT – blend of organic and inorganic nitrogen. This product is recommended in low YAN conditions.

Fermaid® O – 100% Yeast derived organic nitrogen composed of amino acids and peptides and micro-nutrients used in moderate – high YAN conditions. Excellent for efficient fermentation.

(Fermaid® O and Fermaid® AT are precursors to volatile aromatic compounds such as higher alcohols and esters, hence contribute positively to fruit expression).

7. Specific Inactivated Yeast used during fermentation can help build palate weight, colour intensity and fruit expression

OptiMum Red® (300ppm), added during alcoholic fermentation, can have a positive impact on building mid-palate intensity and palate weight. Provides early polysaccharide availability for complexing with polyphenols as soon as they are released and diffused. This early complexing can result in wines with more intense colour, rounder mouthfeel and better tannin integration.

8. MLF – use a wine bacteria in co-inoculation that promotes fruit expression and mouthfeel.

Use a co-inoculation MLF strategy to drive fruit expression and efficient MLF. The wine should be racked off ML lees as soon as it is completed.

Enoferm Alpha™ is recommended for its contribution to mouthfeel.

Lalvin VP41® is recommended for its fruit driven sensory profile.

BETA - COINOC™ has the highest level of berry ester formation in the Lallemand portfolio.

For more information on co-inoculation, visit:

www.lallemandwine.com

9. Shorter maceration program.

Keep maceration times as short as possible. Press the wine at the lowest pressure possible.

10. Fermentation temperature control.

Maintain 22°-25°C – promote fresh fruit + maintains healthy yeast.

11. End of alcoholic fermentation treatment with certain Specific Inactivated Yeast is suggested.

Post-alcoholic fermentation, if a taint exists, an application of a Specific Inactivated Yeast could help to reduce some of the smoky characters. Bench trials can be conducted with Reskue™ (10-40 g/hL) or IOC Flavoclean™ deodorising Carbon (50-150 g/hL). Following treatment with SIY or carbon, rack after 72 hours. Treat wine with Noblesse™ (10-30 g/hL), rack again 2 days later.

PLEASE NOTE: Smoke related characteristics can evolve over time, so early consumption is recommended if possible.

The information herein is true and accurate to the best of our knowledge; however, this data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.

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South Australia & National Accounts

LALLEMAND

australiaoffice@lallemand.com
+61 8 8276 1200

Tanya Worontschak

tworontschak@lallemand.com
+61 (0) 413 694 816

Simon Kinley

skinley@lallemand.com
+61 (0) 409 732 822

Eveline Bartowsky

ebartowsky@lallemand.com
+61 (0) 434 433 313

Jason Amos

jamos@lallemand.com
+61 (0) 423 055 165

WINEQUIP**VICTORIA****Rob Gore**

rob@winequip.com.au
0400 060 267

Peter Kopiec

peter@winequip.com.au
0412 001 191

Daniel Blenkiron

daniel@winequip.com.au
0429 931 480

NEW SOUTH WALES**Gavin Russell**

gavin@winequip.com.au
0412 112 704

WESTERN AUSTRALIA**Amanda Kramer**

amanda@winequip.com.au
0412 817 460

Evan Thompson

evan@winequip.com.au
0408 773 031

SOUTH AUSTRALIA**Justin Coates**

justin@winequip.com.au
0401 857 311

Jeremy Bauer

jeremy@winequip.com.au
0417 739 155

QUEENSLAND**Peter Kopiec**

peter@winequip.com.au
0412 001 191

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