

Techniques for Avoiding Sulfury Aromas

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Acknowledgements

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Key Concepts on Sulfury Odours

- Sulfur Odours (S.O.) can be hard to identify, they saturate the senses quickly
- Every practice in the winery and the vineyard may influence sulfury odours
- S.O.'s have other side effects mainly masking other aromas and changing mouthfeel

How can S.O.'s affect mouthfeel?

- Sulfur compounds not 100% volatile at room temperature, the part in solution is aggressive to the mouth mucous membrane

Main Compounds Involved in S.O.'s

- Sulfur compounds produced by yeast
 - *Saccharomyces*
 - *Brettanomyces et. al.* Brett's first impact is producing s.o.'s, long before E4P is smelled
- Compounds produced during fermentation will form stable derivatives with S.O.'s
- Macromolecules can enhance or diminish S.O. intensity

Challenges with High Brix Grapes

- High risk of s.o.'s produced by the yeast due to low nutrients and high osmotic shock
- Final high alcohol enhances volatile aromas and enhances astringency and bitterness
- Need to develop and stabilize polysaccharides
- Practices to limit astringency and bitterness

Key Tools to Consider

- Maceration Enzymes
 - earlier yeast access to nutrients?
 - earlier polysaccharide/sulfur cmpd interactions?
 - better and earlier racking, less lees contribution to S.O.'s
- Selected Yeast Strain
- Yeast Nutrients



Key Practice to Consider (reds)

- Délestage (rack and return)
 - extracts more macromolecules
 - helps tannin stabilisation
 - limits s.o. production
 - making oxygen available for all yeast
 - complete yeast stirring (mix up lees)
 - physical stripping of H₂S by aeration

Main Factors for S.O. Production (whites and roses)

- Sulfur from vineyard sprays and some pesticides
- Turbidity greater than 150 NTU
- Yeast Stress
- For Reds, include:
 - Lees at the end of fermentation left too long
 - Unsuitable strain of ML bacteria
 - Presence of Brett, Pediococcus or Lactobacillus

Twelve Steps for Preventing Sulfur Off-Aromas in Whites and Rosés

- Critical period for S.O. precursor production is from 22+brix to ~5 brix. Around day 1 to 10
- Critical to perceive any developing S.O.' from ~10 brix to dryness in order to take early corrective actions. Around day 7 to 21.

Twelve Steps for Preventing Sulfur Off-Aromas in Whites and Rosés

1. Have turbidity levels less than 150 NTU
2. Add ascorbic acid to grapes or 50 mg/l to juice after settling and racking
3. Choose low sulfur odour producing yeast strain
4. Rehydrate yeast with sterols (GoFerm, Dynastart)
5. Add nutrient (Fermaid K) to juice at inoculation, rate of 20-30 g/hl
6. Add inactive yeast product (OptiWhite, BoosterBlanc) to juice at time of inoculation



Twelve Steps for Preventing Sulfur Off-Aromas in Whites and Rosés

7. Add 6 mg/l oxygen (macro) at ~2 brix depletion from the starting brix
8. Add nutrient, 10-20 g/hl, at ~7 brix depletion
9. Add 8 mg/l oxygen (macro) at same time as in step 7 and again the next day
10. Keep temp. at 16-18 C from 17 brix to 0 brix
11. Regular mixing (Guth or pumpover, no O₂)
12. Add SO₂ and ascorbic acid right after dryness and rack 24 hrs after (unless ML desired)



Yeast Inoculation Modification

- Rehydration as usual, added sterols optional
- Transfer first rehydration mixture to 2% of total juice volume to be inoculated, equalizing temperature gradually
- Aeration of this starter for 6-8 hours before pitching into main tank

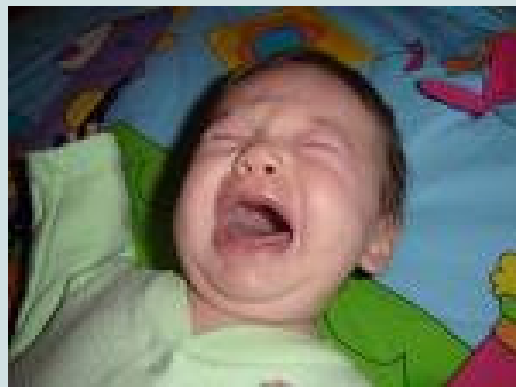
Main Curative Actions, whites & rosés

- If still S.O.'s after first racking (SO₂ and ascorbic added) and if followed the 12 steps
- Add 30 g/hL inactive yeast (OptiRed, BoosterRouge or BoosterBlanc) with mixing once/day for a week with no O₂.
- Do bench trials with copper sulfate

Modified Copper Procedure

- Treat wine with 50% of amount needed as determined in the bench trial
- Mix daily (no O₂) for a week
- Keep molecular SO₂ at 0.8 to 1.0 mg/l
- Add 1 g/hl ascorbic acid on day 8 and rack avoiding O₂
- mix twice/week for a month keeping molecular SO₂ at above level

What to do if didn't follow 12 steps?



Depends on what stage S.O.'s perceived

- 22+ brix to ~12 brix
- 12 brix to ~5 brix
- 5 brix to dryness

More involved procedures, call or email

Twelve Steps for Preventing Sulfur Off-Aromas in Reds

1. Use selected yeast strain, esp. “D” types
2. Rehydrate yeast with sterols (GoFerm, Dynastart)
3. Add nutrient to must at yeast inoculation, 20-30 g/hl
4. Add inactive yeast at inoculation (OptiRed, BoosterRouge)
5. Limit temperature during yeast growth to 25 C or below
6. Add 10 mg/l O₂ at 2 brix depletion from start



Twelve Steps for Preventing Sulfur Off-Aromas in Reds

7. Add nutrient, 10-20 g/hl at ~7 brix depletion
 8. Add 10 mg/l O₂ at same time as step 7 and repeat the next day
 9. Keep temperature during this yeast stationary phase to 25 C or less
 10. Regular mixing of juice/cap
 11. After pressing, rack off lees around 24 hrs later
 12. Inoculate with selected ML strain (VP41, Elios)
- Extra consideration would be micro-oxygenation



Main Curative Actions, Reds, if followed the twelve steps

- Same as for whites/roses using inactive yeast with mixing
- Copper procedure same except keeping SO₂ to around 0.5 mg/l to facilitate MLF.

What to do if didn't follow 12 steps?

- Same as whites, depends on stage noticed

Thanks for your attention and to the
WIGA for this invitation!

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