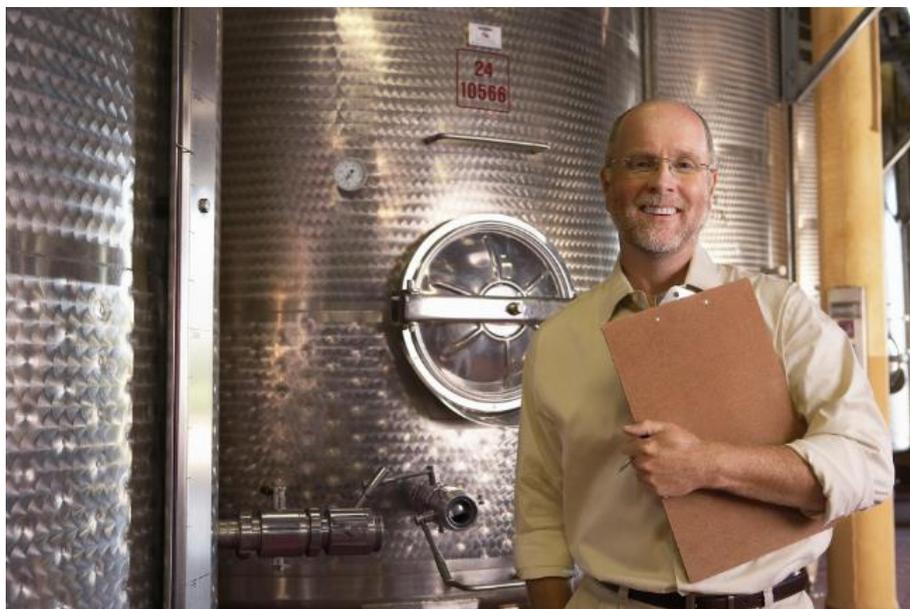


ELEMENTAL SULPHUR SPRAY – PART 2: RESIDUES DURING WINEMAKING



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[Basic Wine](#)

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Elemental sulphur (S^0) plays an important role in powdery mildew management during the growing season. However, several reports have shown that **S^0 residue concentration of more than 10 $\mu\text{g/g}$ in the must can result in increased H_2S production during fermentation¹⁻³.**

In Part 1 of this 2-part blog series, the main findings from a vineyard study investigating the **persistence of S^0 applied at different timings, different formulations and varying concentrations were discussed.** Part 2 will briefly outline the **fate of these residues during pre-fermentative grape and must processing operations.**

The entire study was published in a paper titled: *Persistence of elemental sulfur spray residue on grapes during ripening and vinification*⁴

Materials and Methods

All vines received a single application of **micronized sulphur 12 days before harvest** at a rate of 2.7 kg/ha S⁰.

Five different vinification treatments were tested:

1. whole bunch pressing → initiate fermentation
2. crushed → destemmed → pressed → initiate fermentation
3. crushed → destemmed → 24 hours skin contact (4°C) → pressed → initiate fermentation
4. crushed → destemmed → initiate fermentation → 1 week skin contact → pressed
5. crushed → destemmed → initiate fermentation → 2 weeks skin contact → pressed

Results

Settling and clarification

Settling and clarification reduced the S⁰ residue concentration significantly. The study found that the concentration after clarification was around **75-90% lower** compared to the concentration on the harvested fruit resulting in negligible S⁰ residues (0.05-0.2 µg/g) present in the juice before fermentation (even when a 24-hour cold soak was applied). Concentrations generally declined to below 0.3 µg/g after the juice settled to a turbidity of below 20 NTU. Further investigation showed that the **majority of the original elemental S⁰ fraction was present in the sediment** where the concentration ranged between roughly 20-175 µg/g.

Residue correlation

The S^0 residues on the grapes correlated well with the S^0 residues in the unclarified must, however, as soon as the juice is settled and clarified, the correlation was no longer present. Therefore, the **S^0 residues present on the grapes cannot be used reliably as predictors of S^0 residues in the juice after clarification.**

Similarly, the S^0 residue concentration on the harvested grapes did not correlate well with the amount of H_2S produced during fermentation. Whereas the **S^0 concentration in the settled must was a good predictor of total H_2S produced during fermentation.** Even though the correlation was observed for one of the trials, the correlation failed to manifest during a second trial. Therefore, the S^0 concentration in the settled juice might serve as an **approximate benchmark, but it is not a reliable indicator.**

Skin contact

Skin fermented treatments had pre fermentation S^0 concentrations nearly identical to residue concentrations on the intact berries (around 11 $\mu\text{g/g}$). This was one to two orders of magnitude greater than those in clarified must from the same fruit. The fermentation of the macerated treatments **increased H_2S formation nearly 3-fold over fermentations without skin contact** that were pressed and settled before inoculation. The contribution of other factors associated with skin contact that can lead to increased H_2S production should be considered and could also contribute significantly to the formed H_2S when compared to fermentation using clarified juice.

Conclusion

Results from this study would suggest that **S^0 residues are likely of low concern when producing Sauvignon blanc wines** (no skin contact). Highly clarified musts (<20 NTU) appear to be at minimal risk of contaminating S^0 residues sufficient to produce increased H_2S during fermentation. S^0 residue should be only of concern for skin-fermented wines.

The influence of other factors such as yeast strain and nutrition will not only affect H_2S production by the yeast, but also the conversion efficiency of S^0 to H_2S^1 and should therefore be considered.

References

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