
HOW TO MITIGATE SMOKE EFFECT ON GRAPES AND WINES?

Vineyard and grape exposure to smoke may result in wines with undesirable sensory characteristics such as smoky, burnt, bacon, plastic, medicinal or ash along with 'ashtray', and bitter aftertaste.

Molecules responsible of smoke character in wine: There are hundreds of compounds present in bushfire smoke and can be absorbed by grape berries and vine leaves during a smoke event. The primary compounds found in smoke and responsible for taint in grapes and wines are volatile phenols (guaiacol, 4-methylguaiacol, o-cresol, p-cresol, m-cresol, etc). Once these compounds permeate the grape they can bind with sugars and other compounds found in the grape skins, becoming glycosylated compounds, odorless. However, during fermentation and aging, smoke compounds can be released from their bound form resulting in unwanted smoke odors, flavors and aftertaste.

Smoke analysis on berry samples can give an indication of the potential level of smoke taint, small batch fermentations are a better way to estimate the level of damage in the vineyard. For more info on smoke characters, smoke analysis and sample protocol, check [AWRI website](#)

Bound VS Free smoke compounds:

The removal of the free compounds can be done with fining, and physical treatment such as reverse osmose. The bound portion is the key though to reducing the smoke permanently and eliminate the "return" effect.

How to deal with smoke affected grapes?

They are different approaches in dealing with smoke affected grapes and wines, which need to be combined to get best results in mitigating smoke characters in final wine:

- **Minimize** the extraction and expression of smoke related compounds.
- **Eliminate** volatile phenols responsible for 'smoke' aromas and flavors. This strategy also affects the full composition, balance and harmony of the wine as smoke compounds removal is often associated to positive aromas loss, reducing varietal expression and complexity. It is important to find a compromise in removing smoke without stripping the wine and work on 'rebuilding' the structure and wine complexity after treatment.
- **Counterbalance** smoke expression by increasing wine aromatic complexity, building mouthfeel and length and boosting positive aromas production

MITIGATE SMOKE CHARACTERS - FROM HARVEST TO MATURATION

HARVEST SORTING	Minimize smoke compounds release by respecting integrity of the berries (hand harvest, gentle reception equipment), limiting maceration and sorting out leaf material and any ashes present on grapes. Blowing air on the grapes before harvest allow to remove ashes and reduce the risk of smoke impact.
HARVEST	Limit SO ₂ use to minimize extraction of unwanted compounds. As alternative to SO ₂ for microbial protection, use Excellence B-Nature at 50g/ton – non-Saccharomyces yeast, pure <i>Metschnikovia pulcherrima</i> , non fermentative. It inhibits the development of spoilage microbes such as other non-Saccharomyces, and bacteria on grapes and juice. Excellence® B-Nature® is an organic anti-microbial solution, used as alternative to SO ₂ on grapes. It protects grapes/juice from microbial contamination during transport and processing, does not inhibit <i>Saccharomyces cerevisiae</i> , and reduces SO ₂ combining compounds production, thus increasing SO ₂ efficiency. Excellence B-nature can be added directly to grapes, without rehydration. Simply sprinkle the yeast on the top of the grapes at picking.
PRESSING	<u>For Whites/Roses:</u> We recommend whole cluster press and gentle press cycle, with slow increase in pressure and minimum rotations. Press fractions separation: press cut to be decided by tasting
CLARIFICATION	<u>For Whites/Roses:</u> Eliminate smoke related compounds by promoting a strong clarification and fining of the juice. Add Oenozym Clar at 2-4 mL/hL (clarification enzyme, purified of cinnamyl esterase to limit production of volatile phenols) in the press pan and Polymix Natur' (PVPP, yeast protein extract, bentonite) at 20-40 g/hL to improve settling, remove oxidized phenolic compounds, and smoke related off-aromas.
FERMENTATION	<p>Counterbalance smoke expression by promoting and boosting the production of fruity and fresh aromas and a round and balanced mouthfeel.</p> <ul style="list-style-type: none"> - Yeast selection: select a yeast strain with high aromatic production and high production of mannoproteins to counterbalance 'ashy' and dry finish. <ul style="list-style-type: none"> o Whites/Roses: Excellence TXL o Reds: Excellence DS - Yeast nutrition: rehydrate yeast with OenoStim at 25 g/hL to improve its resistance, optimize its metabolism and compensate the strong clarification. - Add 30 g/hL of OptiEsters during the first 1/3 of fermentation to boost production of esters and acetates. <p><u>For Reds:</u> Add 150-200 g/ton of Softan Vinification – catechins tannins bounded to plant polysaccharides. Added during fermentation, Softan Vinification has a strong ability to stabilize color and protect it from loss during fermentation. It is a gentle tannin that contributes to mouthfeel and build up mid-palate.</p> <p>Counterbalance the 'ashy' aftertaste by building-up mid palate, and increasing the sensation of volume, roundness and fullness. Add 20-30 g/hL of Natur'Soft - preparation of specific yeasts hulls, selected for their high content of polysaccharides. Natur'Soft® increases wine complexity, reduces tannins perception, stabilize color and enhances fruity characters.</p> <p>Recommended: Untoasted Oak chips can reduce intensity of smoke characteristics through increased wine complexity: add Lamothe-Abiet Oenobois FR light at 1-4 g/L during fermentation</p>
PRESSING	<u>For Reds:</u> Separate press fractions and treat separate with fining. Once pressed, promote fast settling and rack off lees early with Oenozym Clar at 2-3 mL/hL. Off-aromas bound to lees and can be eliminated by racking early. It is important to choose an enzyme purified of cinnamyl esterase to limit production of volatile phenols.
END FERMENTATION	<u>For Whites/Roses:</u> Eliminate smoke related aromas by racking off gross lees, 24-48 hours fermentation.
MLF	Choose ML bacteria, fast fermenter and producer of esters and acetates: Oeno1 . To increase production of fresh and fruity aromas and limit smoky characters, co-inoculation is recommended.
MATURATION	Clean racking off lees, 48-72 hours after completion of MLF, and cleaning the barrels.

MITIGATE SMOKE CHARACTERS – FROM MATURATION TO BOTTLING

As smoke related compounds can evolve quickly in bottle and be released with time, increasing their expression, it is recommended to market the wine early.

- 1- Express the volatile phenols responsible of smoke with **Oenzym FW**, a β -glycosidase enzyme able to cleave the bounded smoke related compounds, increasing the level of volatile phenols, easier to be removed by treatments.
- 2- Eliminate volatile phenols, while maintaining wine balance and structure with fining agents. We have been successful with:
 - a. **Caseimix**: pure potassium caseinate. Dosage : 15 -50 g/hL
 - b. **Polymix Natur**: PVPP, yeast protein extracts, bentonite: 15 -50 g/hL
 - c. **NaturFine Prestige**: yeast protein extracts and pectinases: 20 -50 g/hL
- 3- After 5-10 days, rack off lees clean.
- 4- Counterbalance mouthfeel and prepare wine for ageing on 'clean' lees, from another wine, or with the addition of **NaturSoft** at 20-40 g/hL, yeast derivatives rich in mannoproteins.
- 5- Set-up bench trials with tannins to build up mid-palate, balance mouthfeel, counterbalance 'ashy' aftertaste and bitterness sensation and add complexity to aromas. Tannins can also improve wine ageing potential and anti-oxidant protection. We have been very successful with:
 - a. **Tan&Sense Volume**, untoasted oak tannins, build up mouthfeel, fill mid palate and gives roundness on the finish. 1-4 g/hL.
 - b. **Tan&Sense Origin**, lightly toasted oak tannins, gives aromatic complexity with notes of vanilla, coconut and pastries with round and volume on the palate. 2-4 g/hL
 - c. **Tan&Sense Expression**, medium toast FR oak tannins, gives aromatic complexity with caramel, crème brulee and almonds notes and increases sweetness perception on the finish. 2-4 g/hL
 - d. **Softan Finition**, blend of oak tannins and plant polysaccharides. Gives roundness and length to wines, reduces the perception of green and smoke characters. 2- 4 g/hL
- 6- Re-evaluate wine after few months.
- 7- Pre-bottling, set-up bench trials with finishing tannins and polysaccharides.
 - a. **SubliSense**, Arabic gum and yeast mannoproteins to bring roundness, sweetness, smooth the finish and reduce the perception of aggressivity and ashy characters.
 - b. **MannoSense**, pure yeast mannoproteins to elongate wine, give sweetness and eliminate astringency and ashy characters.

Ask us for samples for bench trials. We can also work on your wines, do the bench trials for you, and send you the samples of what works best in your wines. Contact us at eglantine.chauffour@buchervaslin.com