Tannins and Polysaccharides for Aging

Jasha Karasek

Winemaking Specialist, Enartis USA

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Agenda

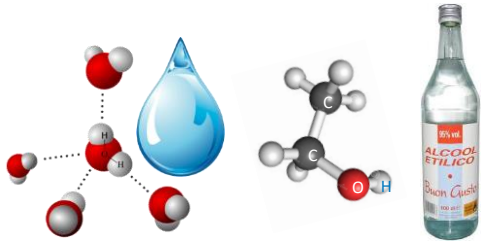
Overview

- Tannins
- Enological Tannin Production
- Enological Tannin Types
- Tannins for Aging
- Yeast Polysaccharides
- Origins and Uses
- How to Balance a Wine
- Bench Trials

How a tannin is made, is very important for its properties

Extractor

Solvent



Matrix

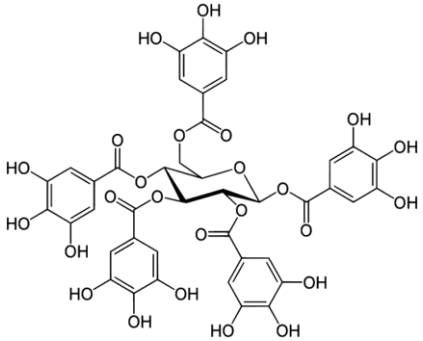
Extraction

❾Concentration

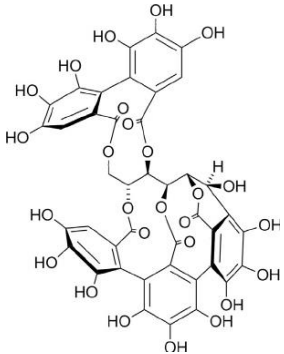
❾Atomization

The starting material is the foundation of its characteristics

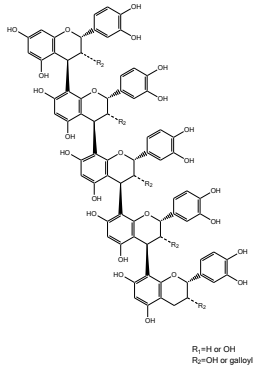
Gallotannin



Ellagitannin



Condensed



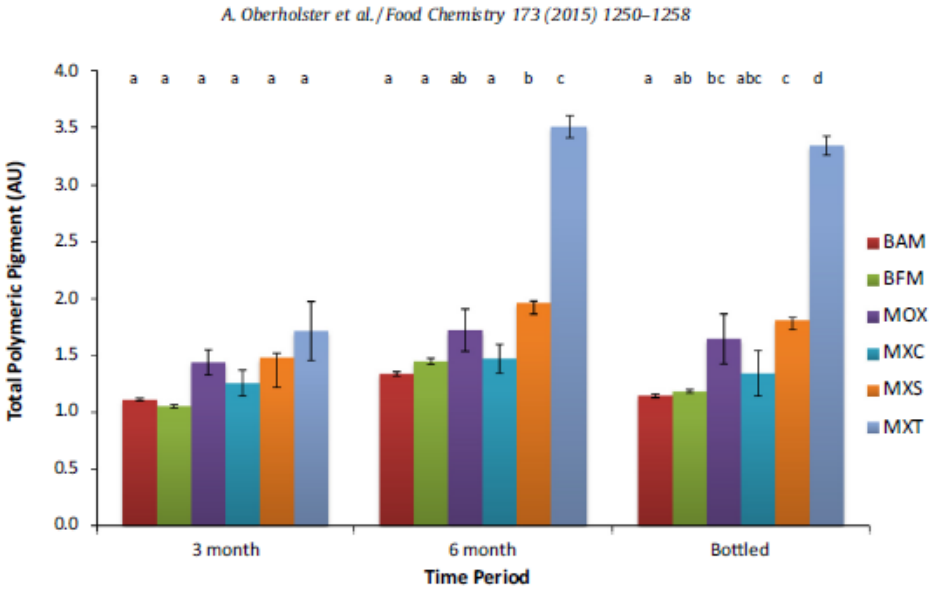
How to decide which tannin you want to use?

- What is the wines style objective?
- What are the current tannin levels?
- What are any additional technical features you are looking for?

OAK DERIVED FOR AGING - EXAMPLE

TANNINS
TANNINI
EnartisTan
CŒUR DE CHÊNE

Origin: light-toast seasoned French Oak
Mouthfeel : soft, improves mid palate
Aroma: spice, vanilla, caramel
Other benefits: color stab



GRAPE DERIVED TANNIN FOR AGING- EXAMPLE

Origin: Mature white grape seed
Mouthfeel : Tightens structure and fills mid palate
Aroma: Black tea, spice
Other benefits: Color stability

	Control	+ Proanthocyanin
Initial		
Total Condensed Tannin g/L	2,8	3,4
Anthocyanin g/L	0,8	0,8
Polymerized Condensed Tannin%	15	15
Combined Anthocyanin %	17	17
3 Months + O_2		
Total Condensed Tannin g/L	2,9	3,2
Anthocyanin g/L	0,6	0,4
Polymerized Condensed Tannin%	23	28
Combined Anthocyanin %	25	38

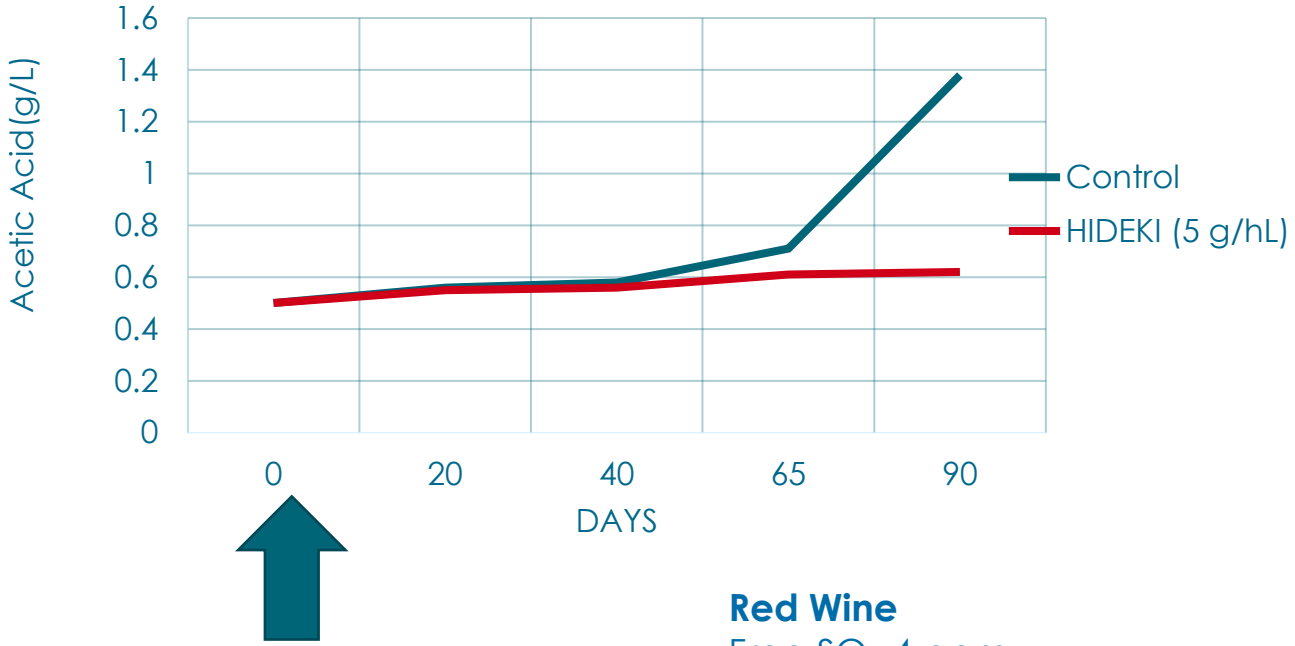
Vivas et al. 2017

NEW INNOVATIVE TECHNICAL TANNIN- AGING OR PRE-BOTTLING

Tannin Type: Blend of gallic, ellagic, condensed tannin
Mouthfeel : neutral
Aroma: Non-Aromatic
Technical use: Microbiostatic and antioxidant

HIDEKI: MICROBIOSTATIC ACTION

HIDEKI
ACETIC BACTERIA CONTROL

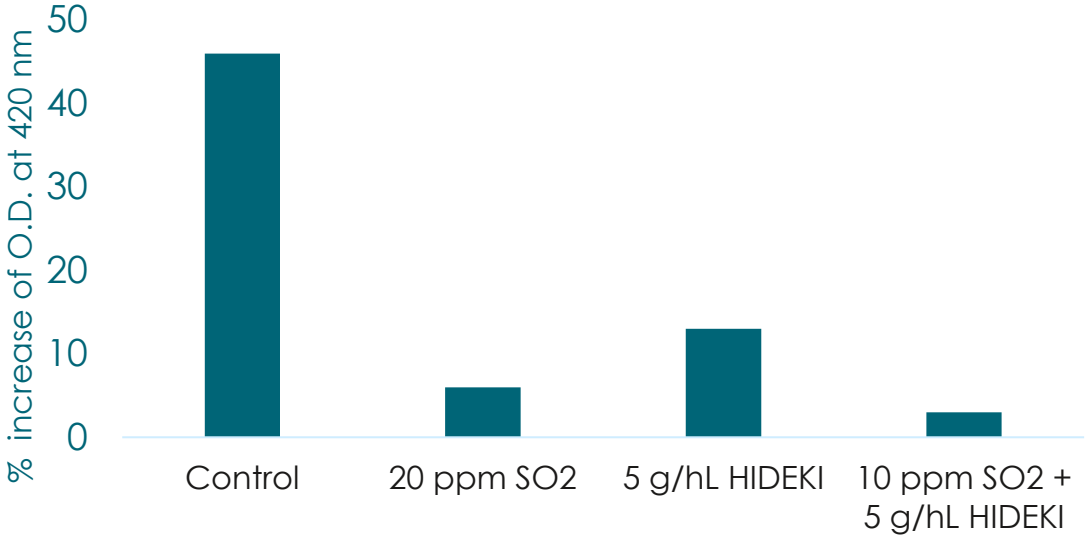


10^2 UFC/mL Acetic Bacteria

Red Wine
Free SO_2 4 ppm
Molecular SO_2 0.07 ppm

HIDEKI - ANTIOXIDANT

YELLOW COLOR % INCREASE



CONTROL **HIDEKI** 5 g/hL

HOW TO SELECT THE RIGHT TANNIN – TECHNICAL APPLICATION

	CONDENSED	GALLIC	ELLAGIC
PROTEIN PRECIPITATION	♦♦♦	♦	♦♦
ANTIOXIDASIC EFFECT	♦	♦♦♦	♦♦♦
ANTIRADICAL EFFECT	♦	♦♦	♦♦♦
EFFECT ON REDOX POTENTIAL	Decreases	Stabilizes	INCREASES (if extracted from toasted wood) STABILIZES (if extracted from untoasted wood)
MERCAPTAN REMOVAL	♦♦	♦	♦♦♦
METAL CHELATION	♦	♦♦	♦♦♦
COLOR STABILIZATION	♦♦♦	♦	♦♦
ANTIOXIDANT EFFECT	♦♦	♦♦♦	♦♦
MICROSTATIC EFFECT	♦	♦♦♦	♦

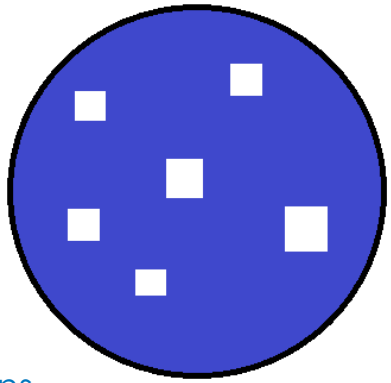
WINEMAKING EFFECT	TANNIN
Protein precipitation	EnartisTan CLAR
Antioxidasic effect	EnartisTan ANTIBOTRYTIS
Antiradical effect	EnartisTan SLI EnartisTan ELEVAGE EnartisTan BLANC
Mercaptan removal	EnartisTan SLI EnartisTan ELEVAGE EnartisTan MAX NATURE
Metal chelation	EnartisTan SLI EnartisTan ELEVAGE EnartisTan BLANC
Color stabilization	EnartisTan V EnartisTan E
Antioxidant protection	EnartisTan SLI EnartisTan BLANC EnartisTan UNICO #3

YEAST POLYSACCHARIDES

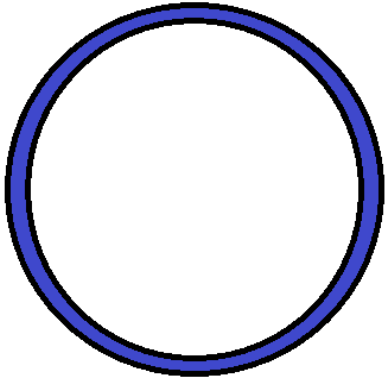
BATTONAGE, SUR LIE AGING

MAIN TYPES

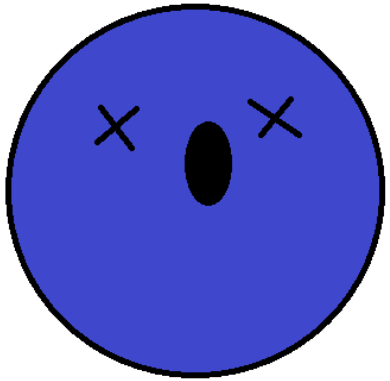
Autolyzed yeast



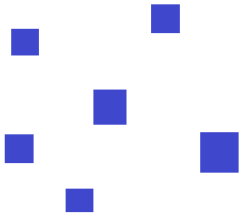
Yeast Hulls



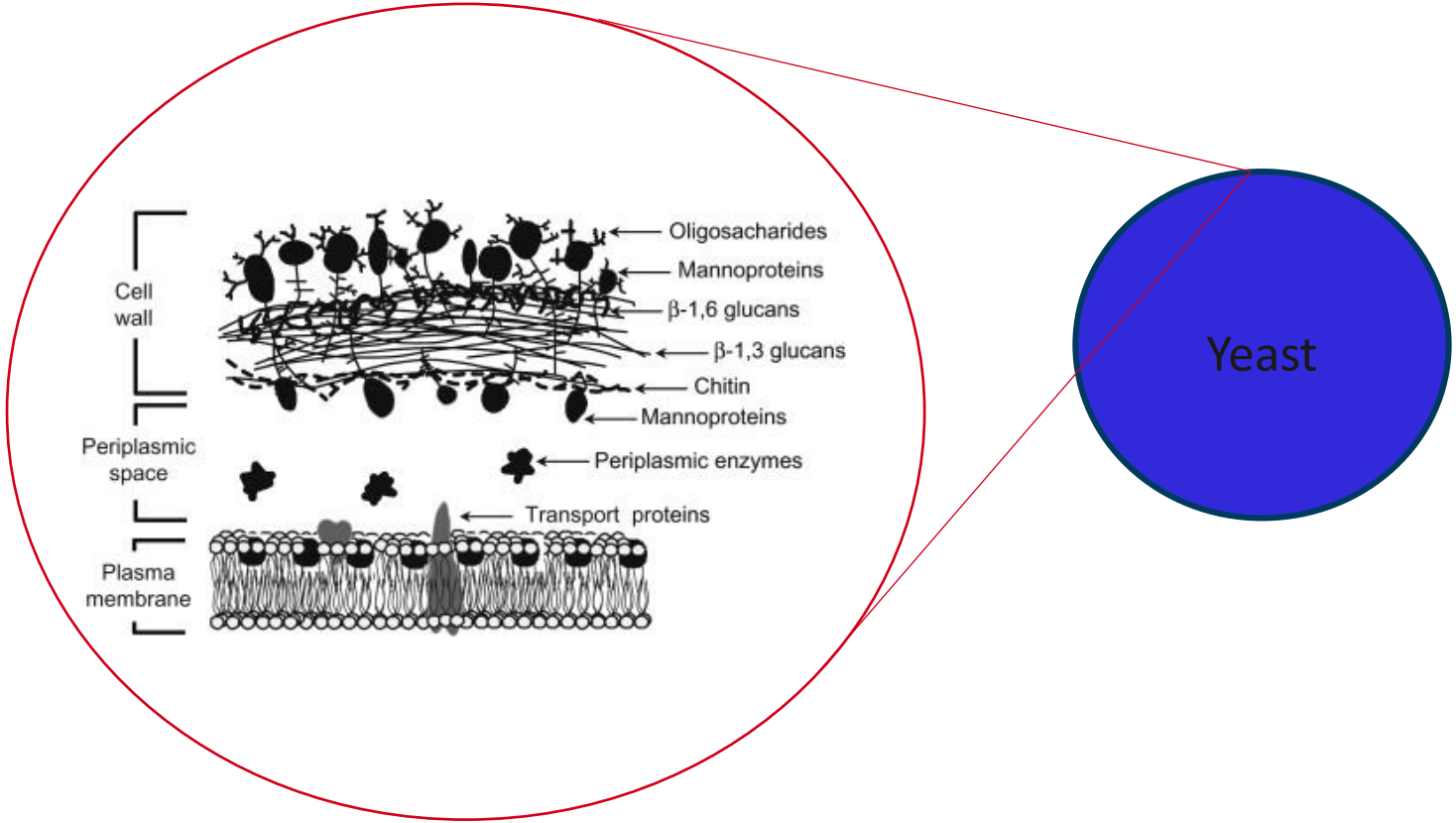
Inactivated Yeast



Mannoproteins



What are they, and how do they impact wine?



YEAST MANNOPROTEINS PROPERTIES

- 80-90 % Mannose, 10-20% protein
- About 40% of yeast cell wall weight
- Negatively charged
- Interacts with other wine colloids
- Improves tartrate stability
- Limits tannin aggregation
- Released in two phases, during fermentation, and Sur lie (autolysis)

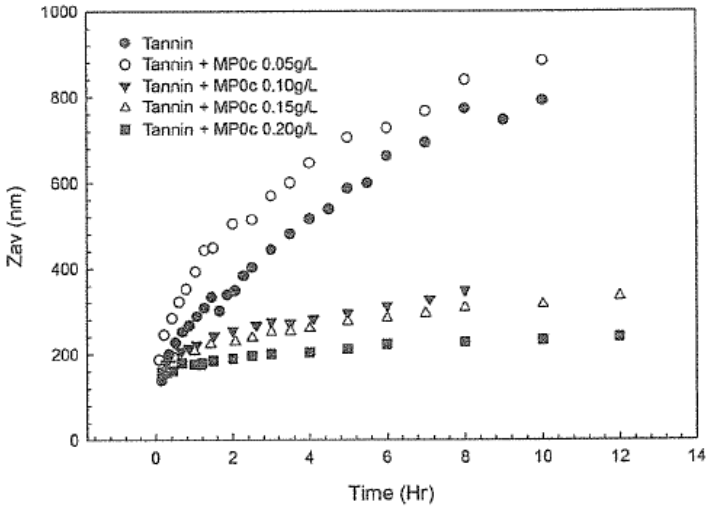
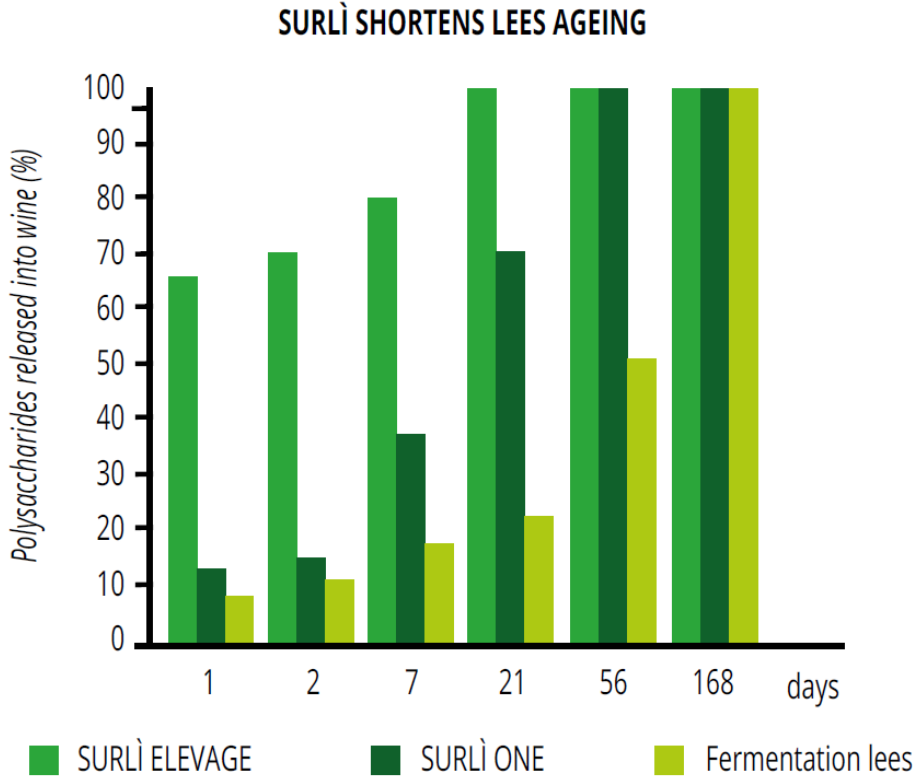


Figure 1 Time-dependence of grape seed tannin aggregation: evolution of aggregate size monitored by dynamic light scattering, with or without MP0c addition in the tartarate buffer (tannin concentration: 1 g L^{-1} in (v/v) water/ethanol 12%, 2 g L^{-1} tartaric acid).

SURLI ONE, SURLI ELEVAGE

FASTER MANNOPROTEIN EXTRACTION



OTHER SITUATIONS WHERE YEAST DERIVATIVES ARE HELPFUL

- Reduced Lees
- Smoke tainted lees
- Brettanomyces
- Other off flavors or aromas

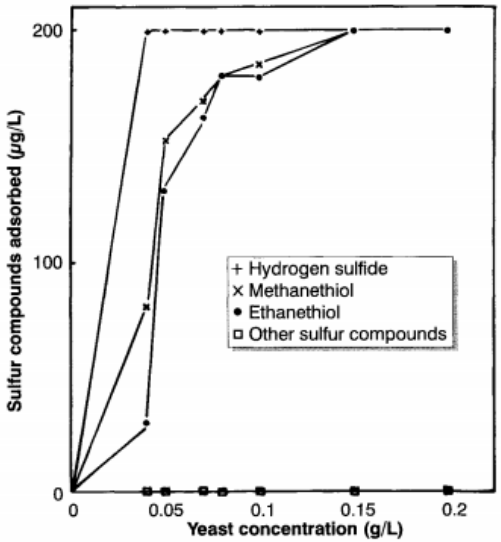


Fig. 1. Adsorption of sulfur compounds by yeast lees. (+) hydrogen sulfide; (x) methanethiol; (●) ethanethiol; (❑) other sulfur compounds.

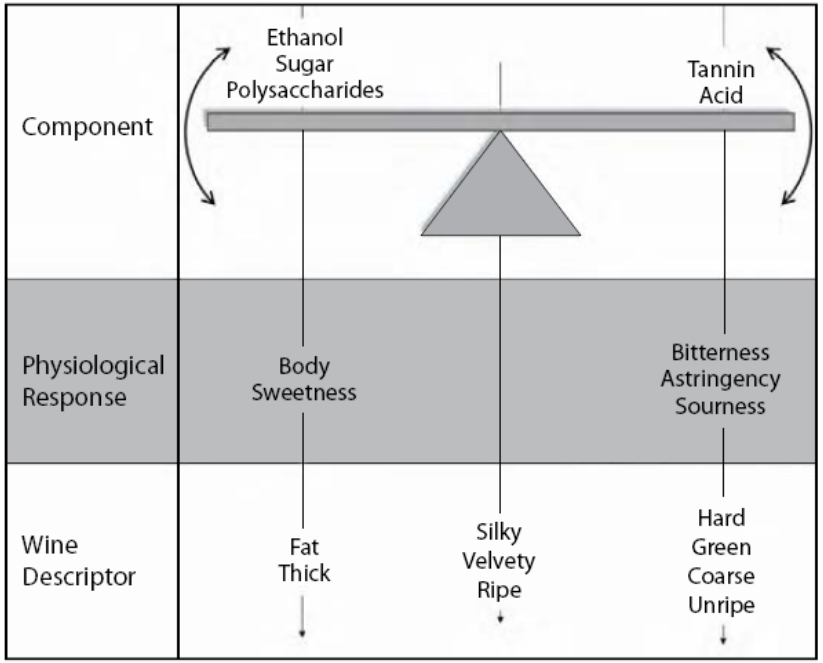
Technical Brief

Evidence For Sulfur Volatile Products Adsorption by Yeast Lees

S. PALACIOS[1], Y. VASSEROT[2]*, and A. MAUJEAN[3]

Am. J. Enol. Vitic., Vol. 48, No. 4, 1997

What are the components of mouthfeel balance?



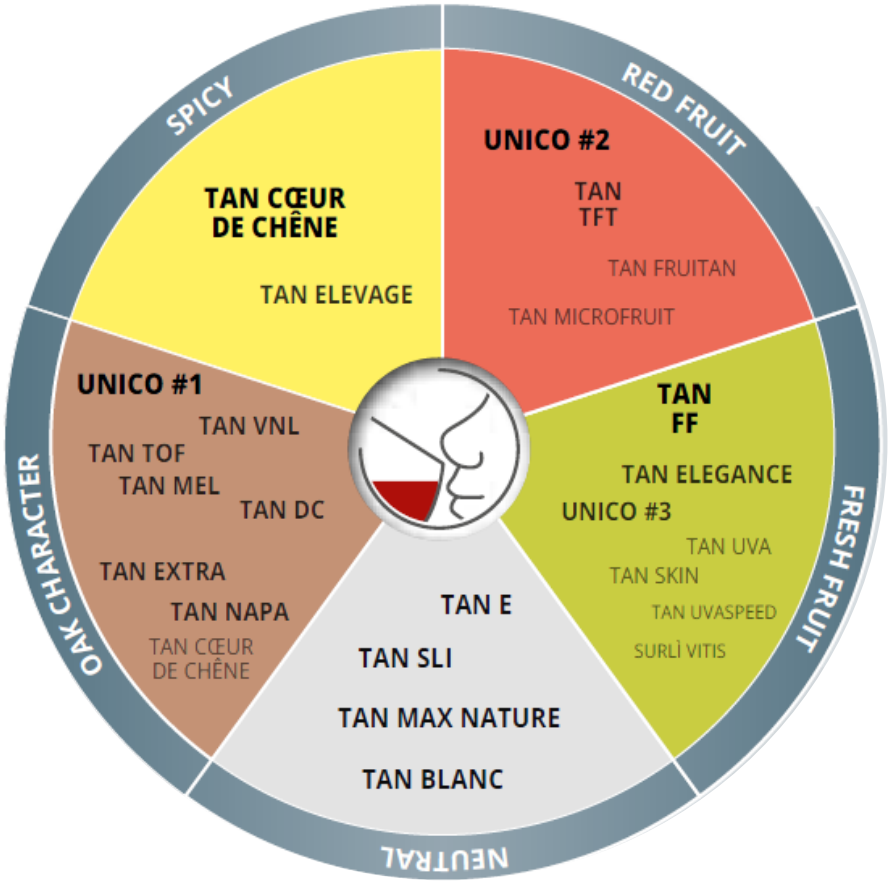
GUIDE FOR WINE AROMA IMPROVEMENT

LEGEND

- Early maturation
- Anytime from early maturation to bottling

- Perfecting aroma
- Perfecting mouthfeel
- Correcting or preventing defects

++++ INTENSE/EFFECTIVE
+++ INTENSE/EFFECTIVE
++ INTENSE/EFFECTIVE
+ INTENSE/EFFECTIVE



GUIDE FOR IMPROVING MOUTHFEEL

LEGEND

- Early maturation
- Anytime from early maturation to bottling

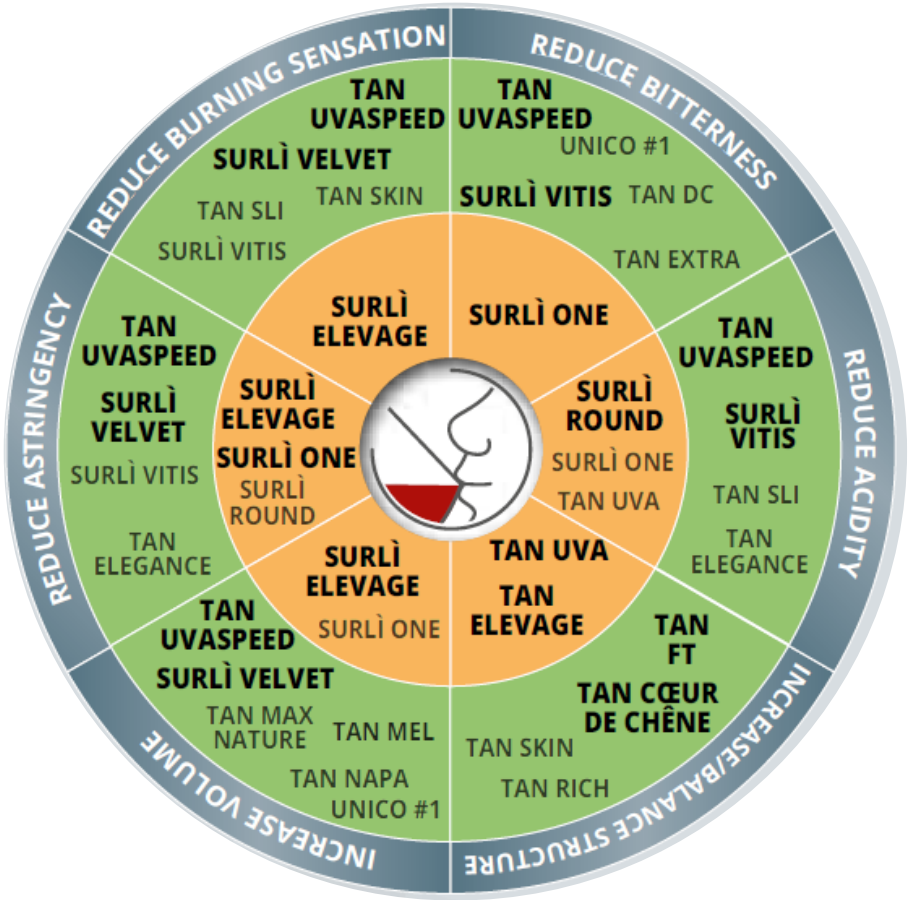
- Perfecting aroma
- Perfecting mouthfeel
- Correcting or preventing defects

++++ INTENSE/EFFECTIVE

+++ INTENSE/EFFECTIVE

++ INTENSE/EFFECTIVE

+ INTENSE/EFFECTIVE



TECHNICAL APPLICATION OF TANNINS AND POLYSACCHARIDES

LEGEND

- Early maturation
- Anytime from early maturation to bottling

- Perfecting aroma
- Perfecting mouthfeel
- Correcting or preventing defects

++++ INTENSE/EFFECTIVE

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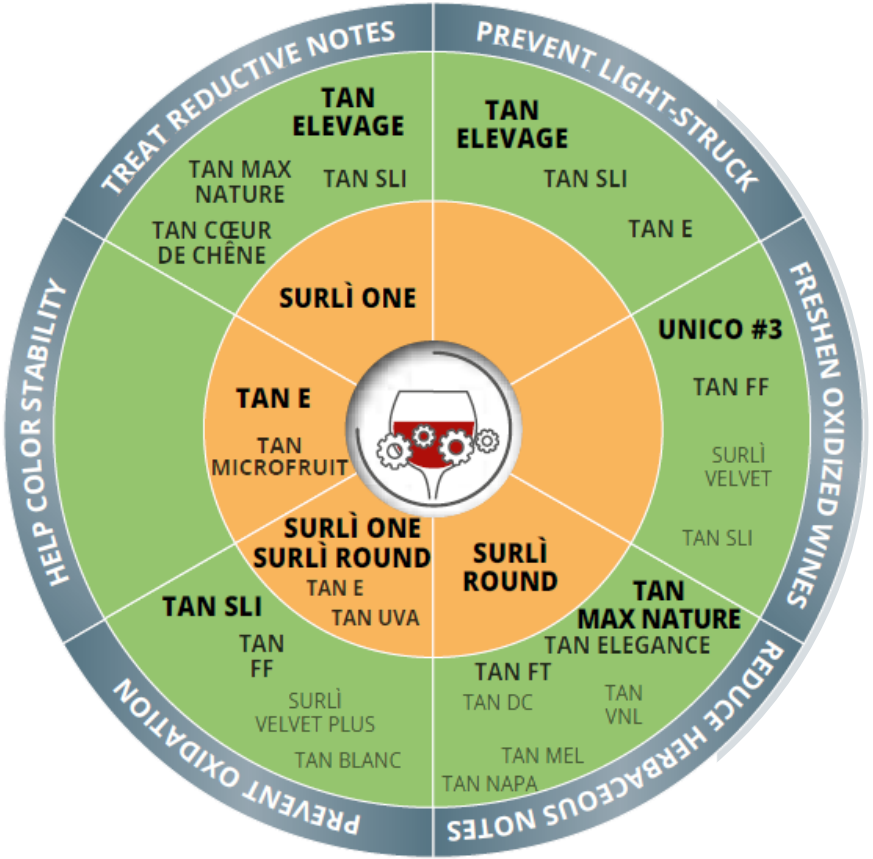


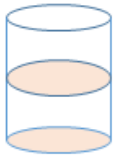
BENCH TRIALS ARE EASY WHEN YOU HAVE THE EQUIPMENT

- Pipetteman
- 10 x Bottles (~100 mL)
- Scale (0.01 g +)
- Tannin / Polysaccharide Samples W/ TDS sheets
- Beakers, wine glasses
- Bench Trial calculator (Enartis.com)

BENCH TRIAL STEPS

1 g Tannin / Polysaccharide

Fill to 100 mL to make
1% w/v solution



*** be sure to follow TDS instructions on preparation of solution*

TAKE AWAYS

- Tannins are not all the same!
- Finding the right tannin for your wine can be challenging, narrow selection by defining objective goals
- Oak and Grape based tannins can both be used in aging to improve sensory properties and benefit wine quality
- Enartis has tools to aid in finding the right tannin or polysaccharide for your objective
- Bench trials are a great process for testing sensory impact of tannins and polysaccharides

JASHA KARASEK

JASHA.KARASEK@ENARTIS.COM

www.enartis.com