BUILDING THE PERFECT BODY

Tannin Strategies for Red Hybrid Wines
WHAT ARE TANNINS?

Plant polyphenolics capable of cross-linking collagen fibers in animal hides

...a purely functional categorization.

Tannins can bind with proteins
CONDENSED TANNINS

SKINS
CONDENSED TANNINS
LOTS OF TANNIN!
Very hard to extract.
SKIN TANNINS DOMINATE IN WINE
FLAVAN-3-OLS

(+) Catechin

(-) Epicatechin

Gallocatechin gallate
CONDENSED TANNINS

epicatechin

catechin

Condensed Tannin
CONDENSED TANNINS
CONDENSED TANNINS

mean Degree of Polymerization
HYDROLYSABLE TANNINS
HYBRID WINE IS LOW IN TANNIN
... & TANNINS ARE SMALL (mDP)

<table>
<thead>
<tr>
<th></th>
<th>Maréchal Foch</th>
<th>Marquette</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corot noir</td>
<td>3.21</td>
<td></td>
</tr>
<tr>
<td>V. vinifera</td>
<td>2.62</td>
<td>2.26</td>
</tr>
<tr>
<td>7-13</td>
<td></td>
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</table>
HYBRID GRAPES HAVE LOWER TANNIN?
RED WINE PHENOLICS

CABERNET SAUVIGNON

WINE TANNIN
GRAPE TANNIN

X 100

TANNIN EXTRACTABILITY
1. ADD TANNIN

2. DEFEAT SORPTION
TANNIN ADDITIONS
# Wine Tannins

<table>
<thead>
<tr>
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<th>Condensed</th>
<th>Hydrolysable</th>
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<tbody>
<tr>
<td>Grape derived</td>
<td>tannin:protein = 20:1</td>
<td>Wood derived</td>
</tr>
<tr>
<td></td>
<td>Temperature independent</td>
<td>tannin:protein = 40:1</td>
</tr>
<tr>
<td>Ethanol independent</td>
<td></td>
<td>Temperature ↑ binding</td>
</tr>
<tr>
<td>Potential for color stabilization activity</td>
<td></td>
<td>Ethanol ↓ binding</td>
</tr>
<tr>
<td></td>
<td>No known potential for color stabilization</td>
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</table>
RED WINE PHENOLICS

<50%

SENSORY?

ACTIVITY?

Processing aids

TANIN BIOTAN®

LAFFORT

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HOW MUCH?

A LOT.

MAYBE A WHOLE LOT.
RED WINE PHENOLICS

NO SENSORY DIFFERENCES

*except in Corot noir
400ppm & 800ppm

NO SENSORY DIFFERENCES*
WHEN?

EARLY ADDITIONS ALLOW WINE COMPONENTS TO ‘INTEGRATE’
LATER ADDITIONS = GREATER RETENTION
1. FERMENT RED WITHOUT TANNIN ADDITION

2. FERMENT RED AS WHITE +TANNINS

3. BLEND
White + & blend + 400ppm

Sensory difference in Corot noir, but not Maréchal Foch or Cab Franc
POLYMERIC PIGMENTS

Portosin

Vitisins

Pinotin

Tannin-Anthocyanin & Anthocyanin-Tannin Adducts
POLYMERIC PIGMENTS

MONOGLUCOSIDES
(PRIMARILY MALVIDIN)
Inhibition may occur with some LAB cultivars. VP41 & Omega are known performers.
WHAT ABOUT ENZYMES?

Low Binding
Tannin leaves the insoluble cell wall and enters wine

Add enzyme

Or...

High Binding
Tannin remains bound to insoluble cell wall materials

Or...

Low Binding
Tannin leaves the insoluble cell wall and enters wine
TANNIN BOOST?
## TYPICAL ADDITION RECOMMENDATIONS

<table>
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<th>Fermentation</th>
<th>Cellaring</th>
<th>Finishing</th>
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<td>Addition</td>
<td>Grapes at crusher or during first pumpover</td>
<td>During racking; 3-6 weeks prior to bottling</td>
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<td>Goals</td>
<td>Color stabilization Mouthfeel/structure Antioxidant</td>
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- Condensed tannins best for color stabilization at fermentation
- Hydrolyzable may promote fuller mid-palate and softer mouthfeel (lower, slower protein interaction)
# Hybrid Addition Recommendations

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- Condensed tannins best for color stabilization at fermentation
- Hydrolyzable may promote fuller mid-palate and softer mouthfeel (lower, slower protein interaction)
TANNIN STRATEGIES

- Add tannins as late as possible
- Avoid additions right before MLF
- Double or triple addition rate...
- ...but do your research!
ACKNOWLEDGEMENTS
QUESTIONS?