



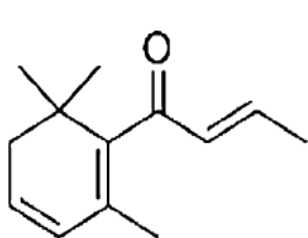
MAXIMIZING NOR- ISOPRENOIDS EXPRESSION IN WINEMAKING

Eglantine Chauffour

Technical Marketing Supervisor - Enartis USA



MAIN C13-NORISOPRENOIDS



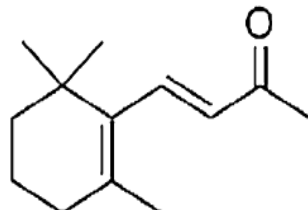
β -Damascenone



Cooked Apple,
Honey, Ripe fruit

+

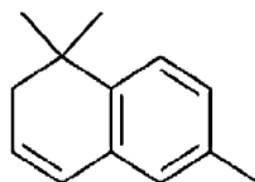
CHANGE
MOLECULE
SENSORY
THRESHOLDS



β -Ionone



Violet



TDN



Petrol/Fuel

✓ *Syrah, PN, CS, Gamay, Merlot, Negrette*

✓ *Chenin, SB, Riesling*

✓ *Free or glycoconjugated to decrease their toxicity.*

✓ *B-Damascenone increases sensory threshold for IBMP and decreases sensory threshold for ethyl cinnamate and ethyl caproate (Pineau et al 2007).*



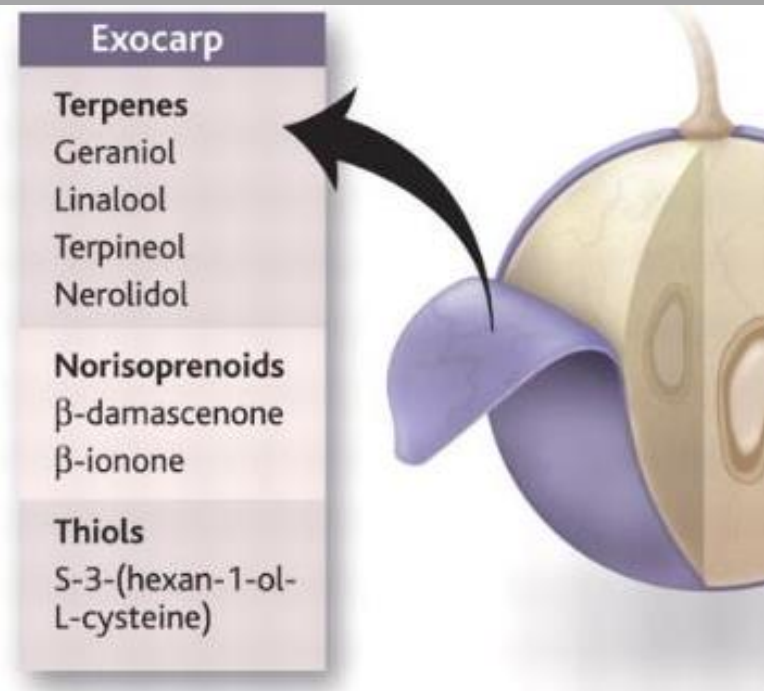
HOW TO OPTIMIZE NORSIPRENOIDS LEVELS IN WINE?

Maximize the extraction of the compounds

Enhance the level of aromatic precursors in the juice/wine

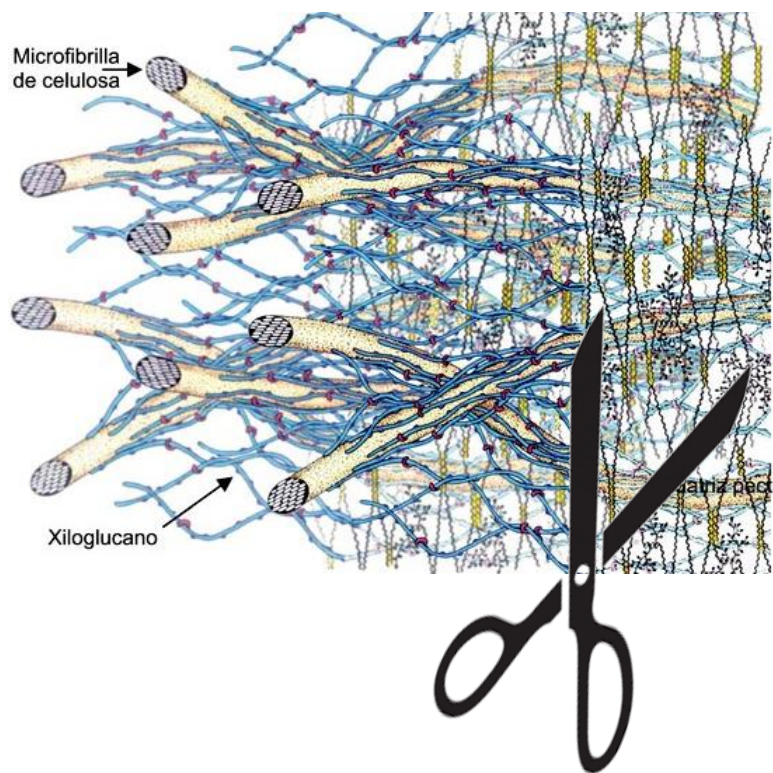
Express/Transform the aromatic precursors

Protect/Maintain aromatic compounds through ageing





EXTRACTION OF AROMATIC PRECURSORS



Crushing

Skin contact



Temperature

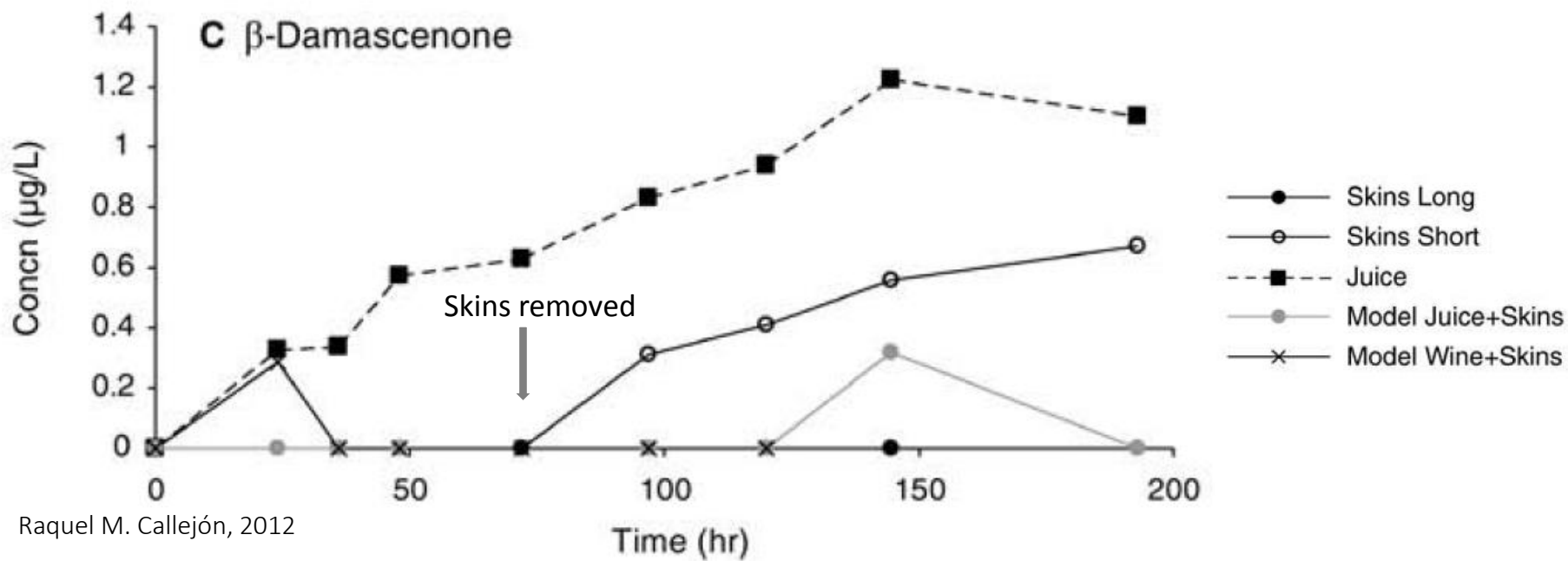
Cap
management

Pressing



WHY USING MACERATION ENZYMES?

- Aromas extraction
- Facilitate color extraction
- Improve protein stability
- Improve color stability
- Increase mouthfeel sensation due to polysaccharide extraction
- Increase press yield
- Facilitate juice settling and wine filterability



Raquel M. Callejón, 2012

Skin contact

- Less β -damascenone when long skin contact
- Sorbing effect ?
- Delay the release and/or formation of β -damascenone



ENHANCE AROMATIC PRECURSORS

Condensed tannins with **nor-isoprenoids and terpenes precursors**

Extracted from **lemon tree, exotic species of wood and grape skins**

Increase citrus, lemon blossom, floral and spicy notes

Increases antioxidant protection, wine structure and length

Dosage: 2-10 g/hL



Condensed tannins with **nor-isoprenoids and terpenes precursors**

Extracted from **cherry tree, red fruit tree wood and grape skins**

Increase red fruit, spicy and floral notes

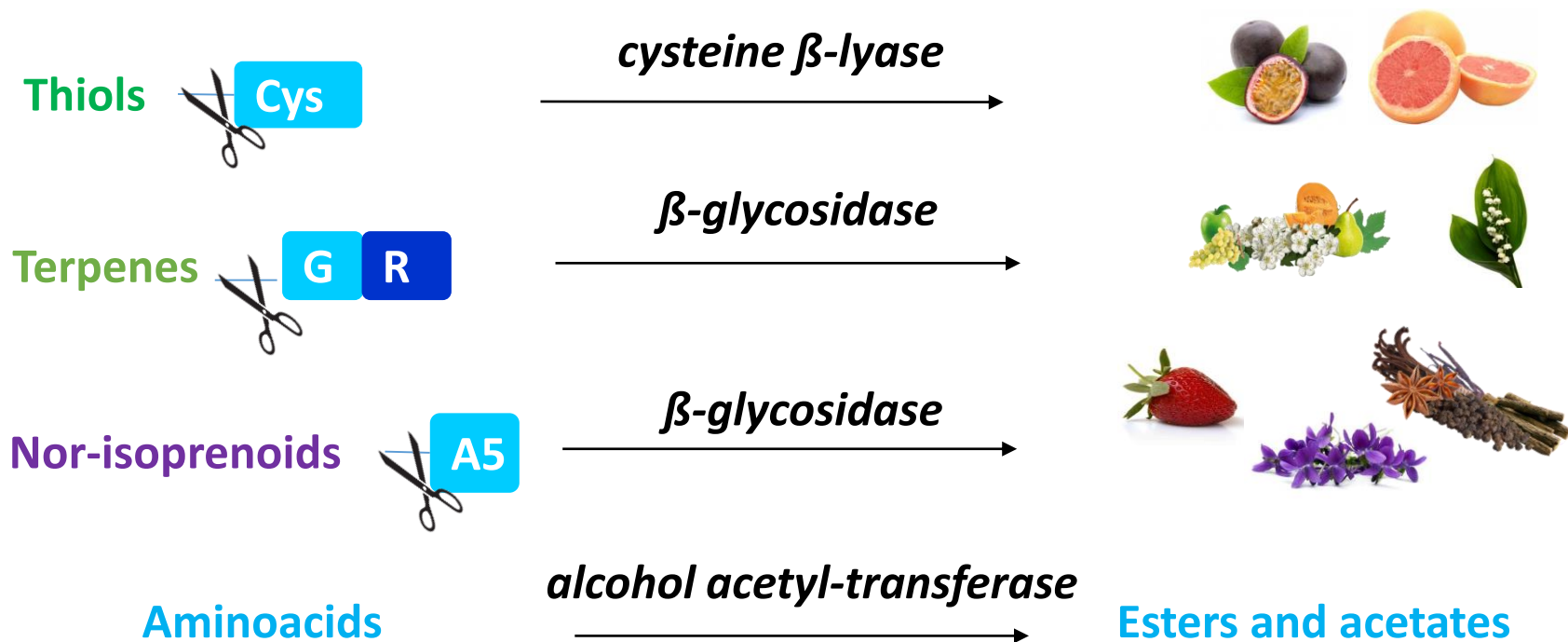
Reduces green characters

Increases antioxidant protection, wine structure and length

Dosage: 2-10 g/hL



AROMA EXPRESSION – RELEASE OF PRECURSORS



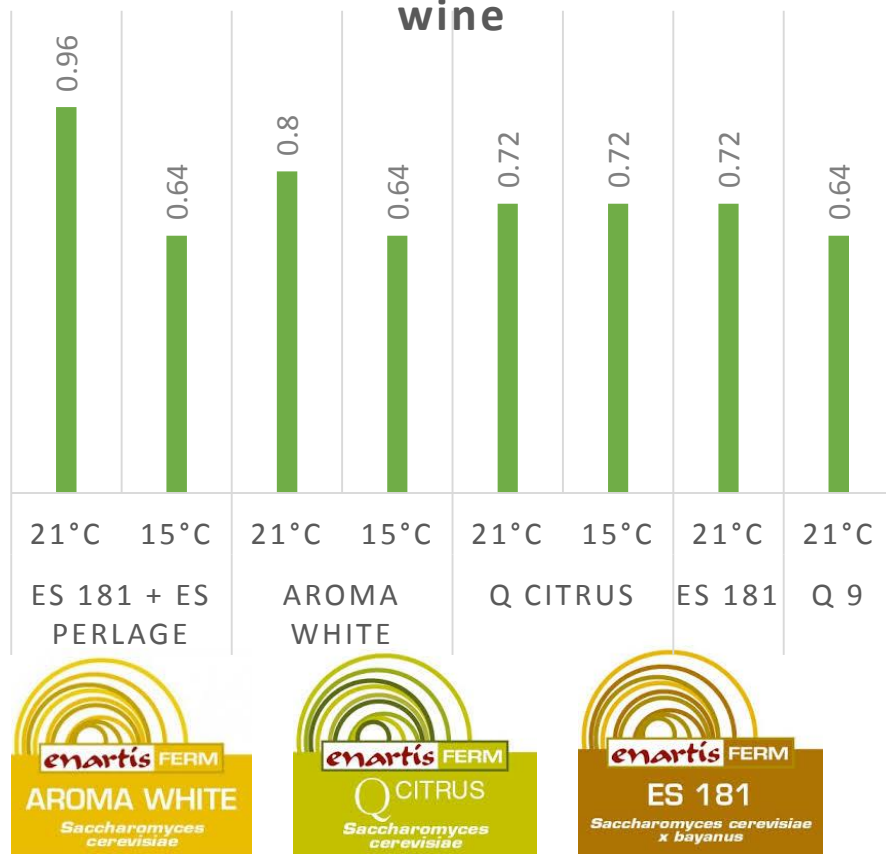
Liberation of aromatic precursors = enzymatic reactions

- Microbial
- Enological enzymes

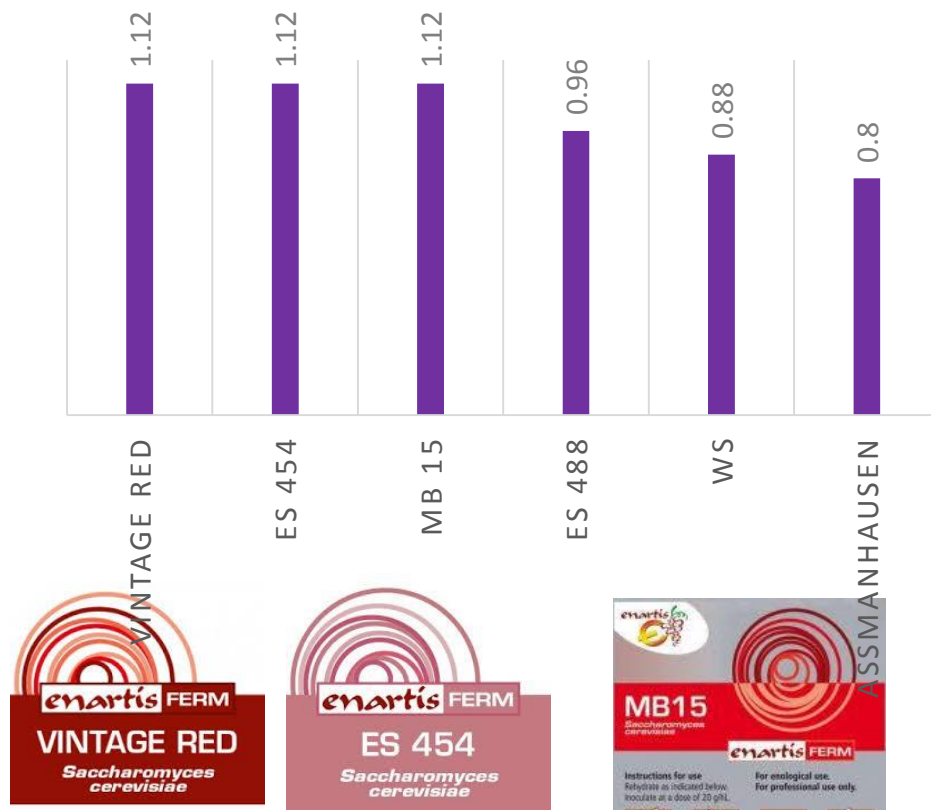
Strong yeast impact

Low impact of fermentation temperature

β -damascenone ($\mu\text{g/L}$) - white wine

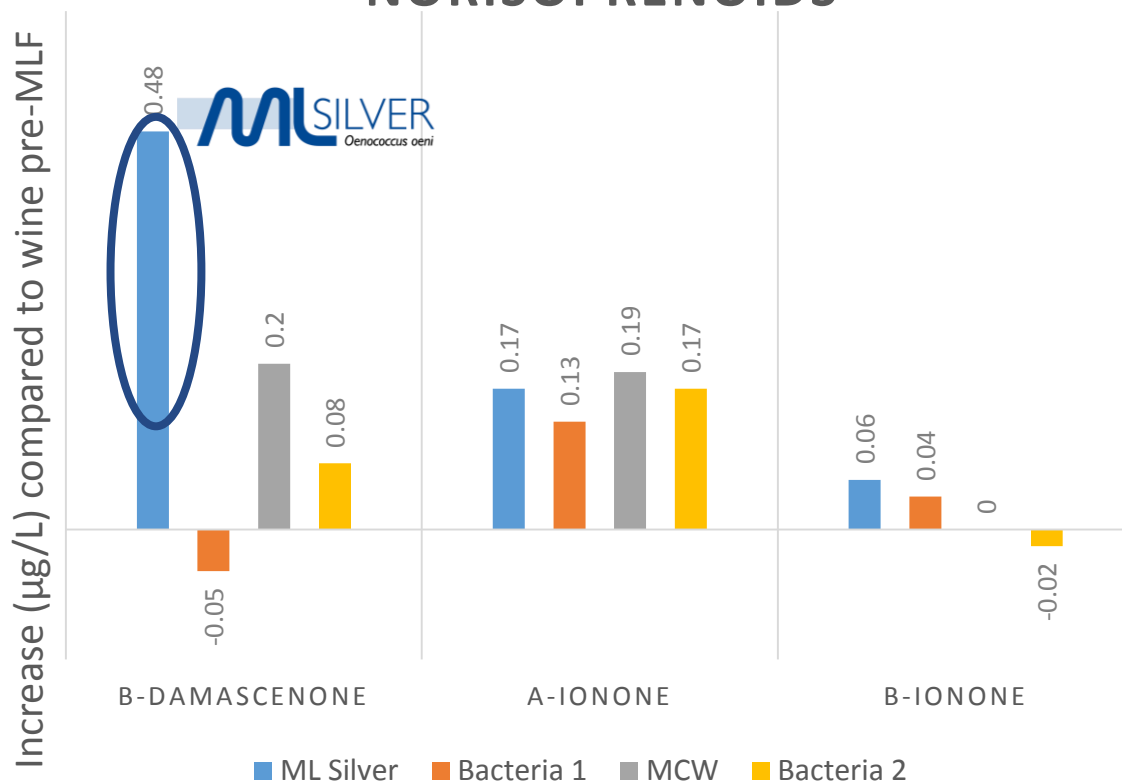


β -damascenone ($\mu\text{g/L}$) - PN wine



BACTERIA IMPACT

ML BACTERIA IMPACT ON NORISOPRENOIDS





B-GLUCOSIDASE ENZYMES

Why using enzyme? Which activity?

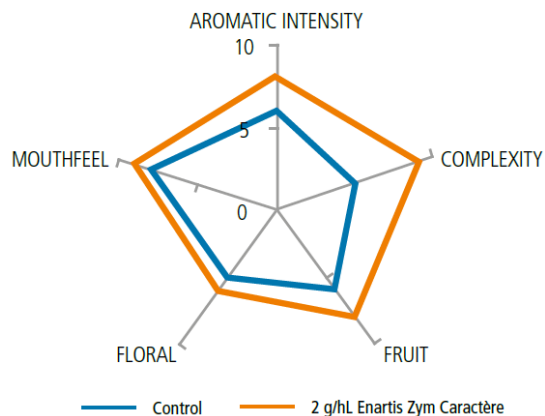
- β -glycosidase enzyme liberates terpenes and norisoprenoids from sugars
- Zym caractere: pectolytic enzyme with hemicellulasic and β -glycosidasic activities



How long for contact time?

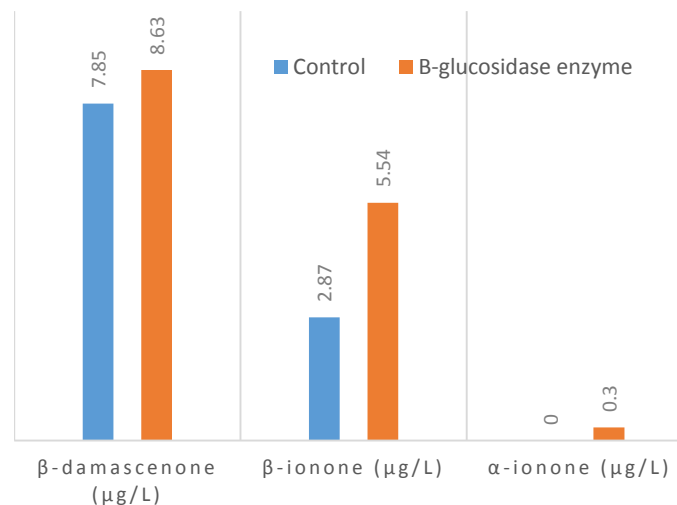
- Few weeks to 2-3 months

IMPACT OF ZYM CARACTÈRE ON WINE ORGANOLEPTIC PROFILE



After 2 months contact, 2 g/hL of Enartis Zym Caractère enhances aromatic intensity, complexity and mouthfeel of wine.

Impact of β -glucosidase enzyme on norisoprenoids expression



NOR-ISOPRENOIDS DURING AGEING

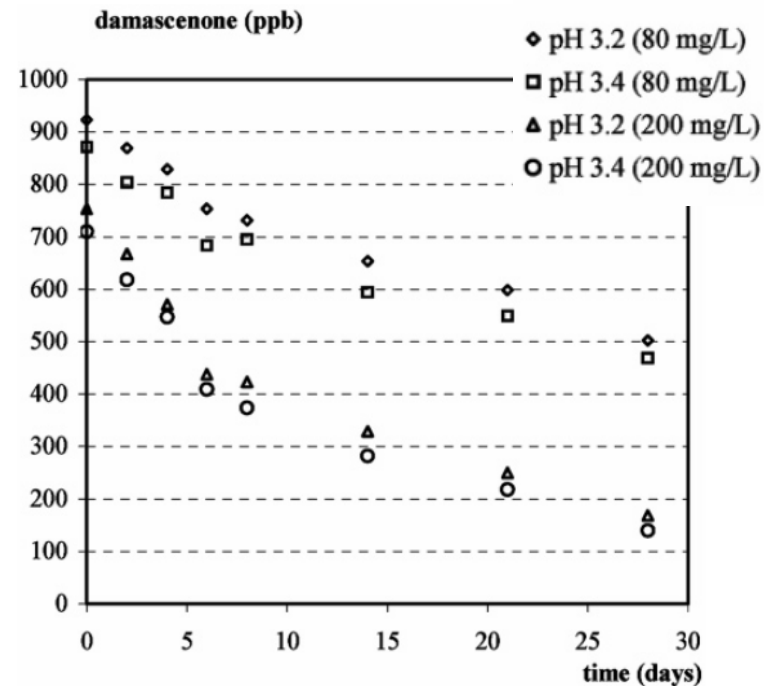


Figure 3. Effect of pH and added SO₂ on the level of damascenone over time, at 25 °C (upper) and 45 °C (lower).

Daniel, 2004

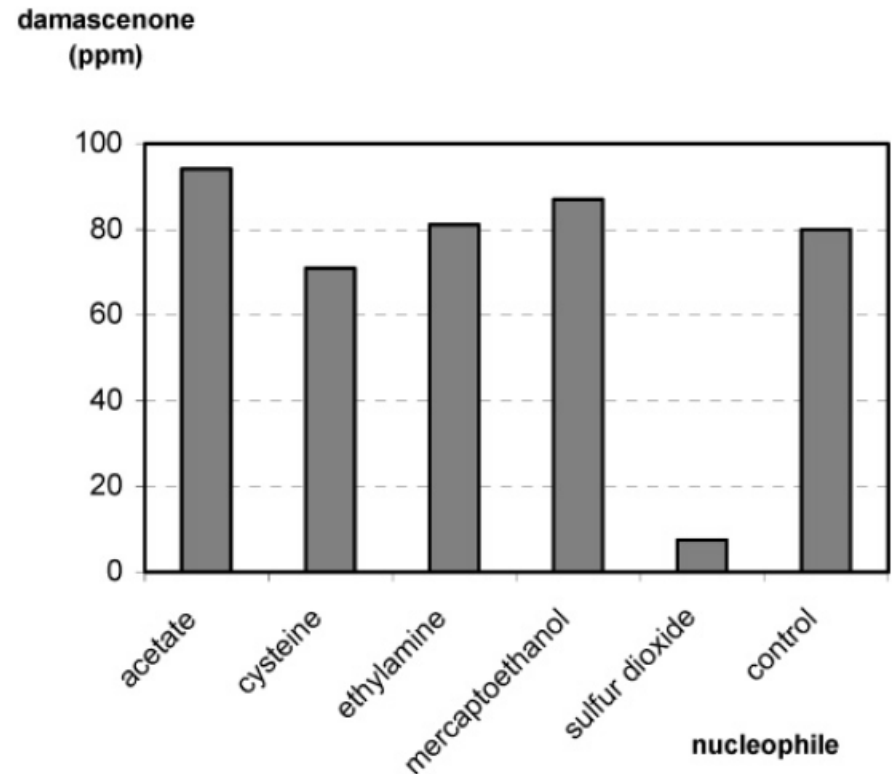


Figure 1. Damascenone remaining after 60 days at 45 °C, pH 3.0.

SO₂ reduce β-damascenone content

- SO₂ reacts with carbonyl compounds to produce bisulfite adducts.

β-damascenone react with mercaptans and thiols



HOW TO MEASURE C13-NORISOPRENOIDS?

Nor-isoprenoids panel

- Total β -damascenone
- Total β -ionone

Method:

- GC-MS

Sample

- Representative 200 berries
- 50 mL of wine

Cost

- \$95 wine
- \$110 grapes





<http://www.enartis.com/us/focus-on>

THANK YOU VERY FOR
YOUR ATTENTION

THANK YOU TO OUR
SPEAKERS

