



# VINIFLORA<sup>®</sup> Yeast Range

Preparing for Pre- & Primary Fermentation:  
Pondering the Possibilities of Your Microbiological  
Toolbox

May 2021



A microscopic view of numerous white, spherical yeast cells against a black background. The cells vary in size and some show a fuzzy, textured surface.

**Chr. Hansen is a bio-science  
company since 1874 ...**

**- Making culture is our core activity**

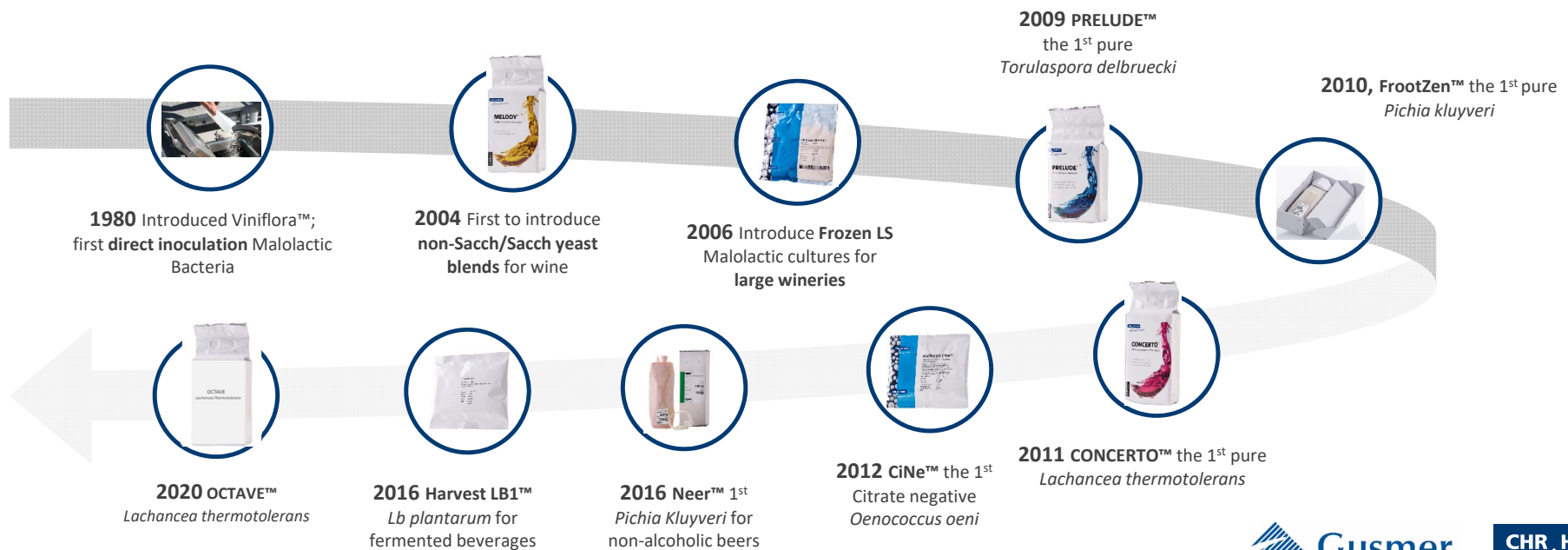


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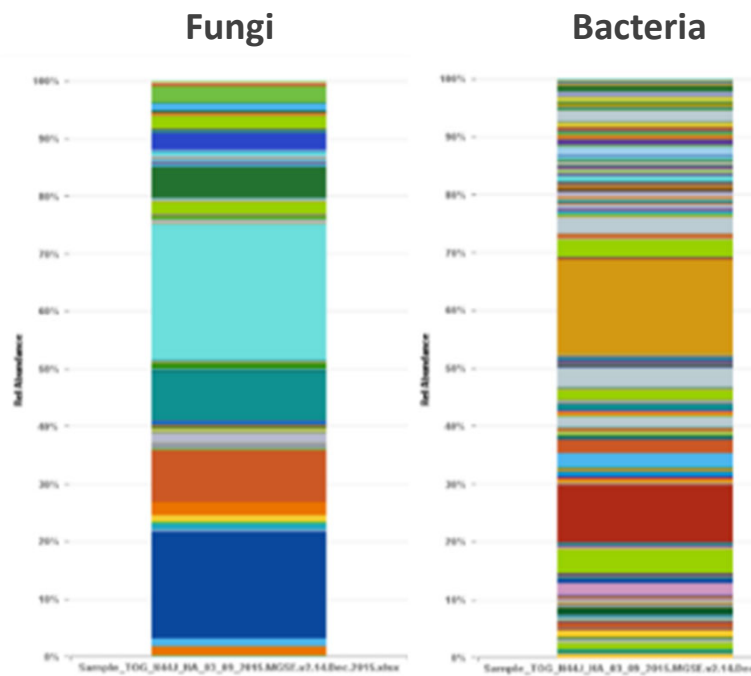
# History of wine cultures development - Part of Chr. Hansen DNA

Since the beginning of “Direct to vat” cultures for malolactic fermentation in the 80’s, Chr. Hansen has always offered innovative solutions for wine industry

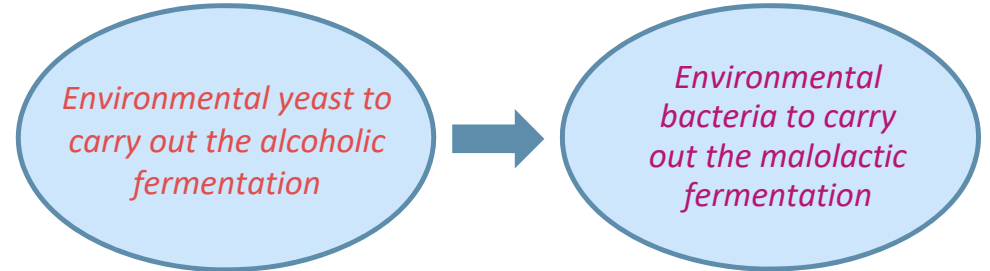




# Managing fermentation



In red grape must



- ▶ While this often gave acceptable results, it also carries a high risk of spoilage/contamination from unwanted microbes
- ▶ In late 20<sup>th</sup> century, commercial yeast and MLF cultures that can be added to wine were introduced, allowing greater control over the microbial population in the wine

# Manage your fermentations with Chr. Hansen VINIFLORA®

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## COMPANY

- › Fermentation experts
- › Highest QC methods
- › Sustainability
- › Global reach
- › Innovation bio-tech
- › VINIFLORA® for wine



## PRE-ALCOHOLIC FERMENTATION

- › VINIFLORA® yeast range
- › *Non-Saccharomyces* yeast for
  - › BioProtection
  - › Mouthfeel
  - › Differentiation
  - › Acid Balance



## ALCOHOLIC FERMENTATION

- › VINIFLORA® yeast range
- › *Saccharomyces* yeast for
  - › Fruit forward wines
  - › Consistency
  - › Low nutrient demands
  - › Bacteria synergies



## MALOLACTIC FERMENTATION

- › VINIFLORA® bacteria range
- › *Lactic acid bacteria* for
  - › Stability
  - › Sensory
  - › Efficiency
  - › Food Safety



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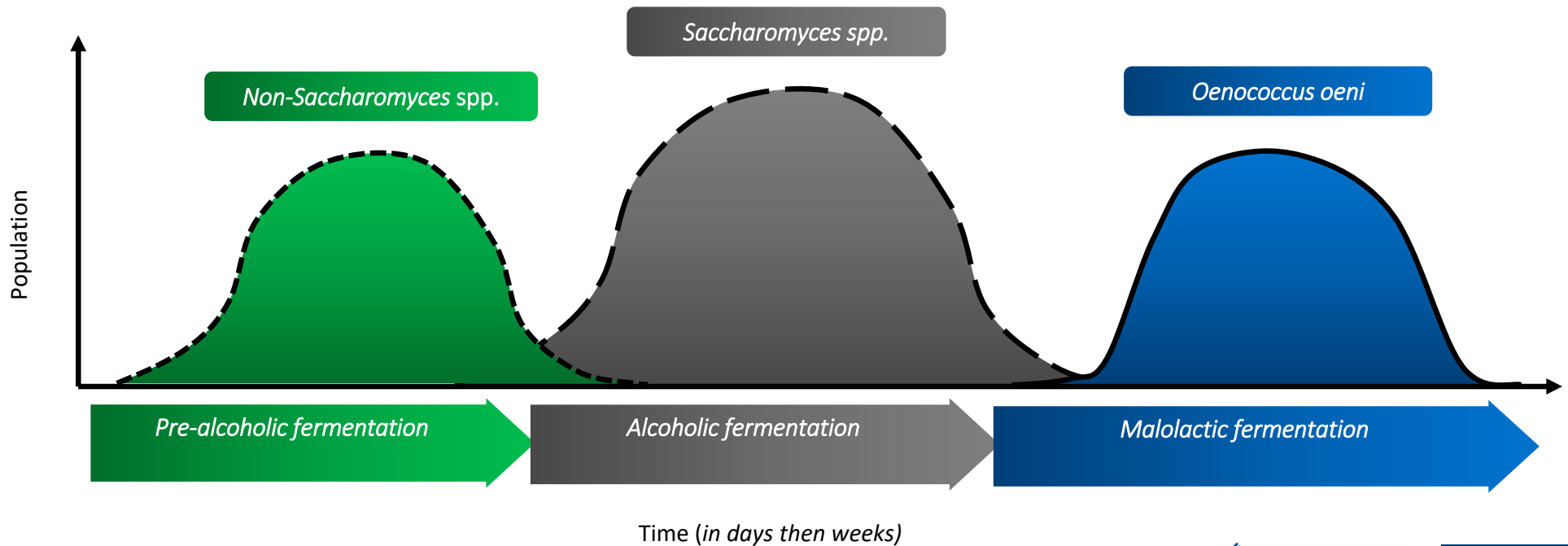
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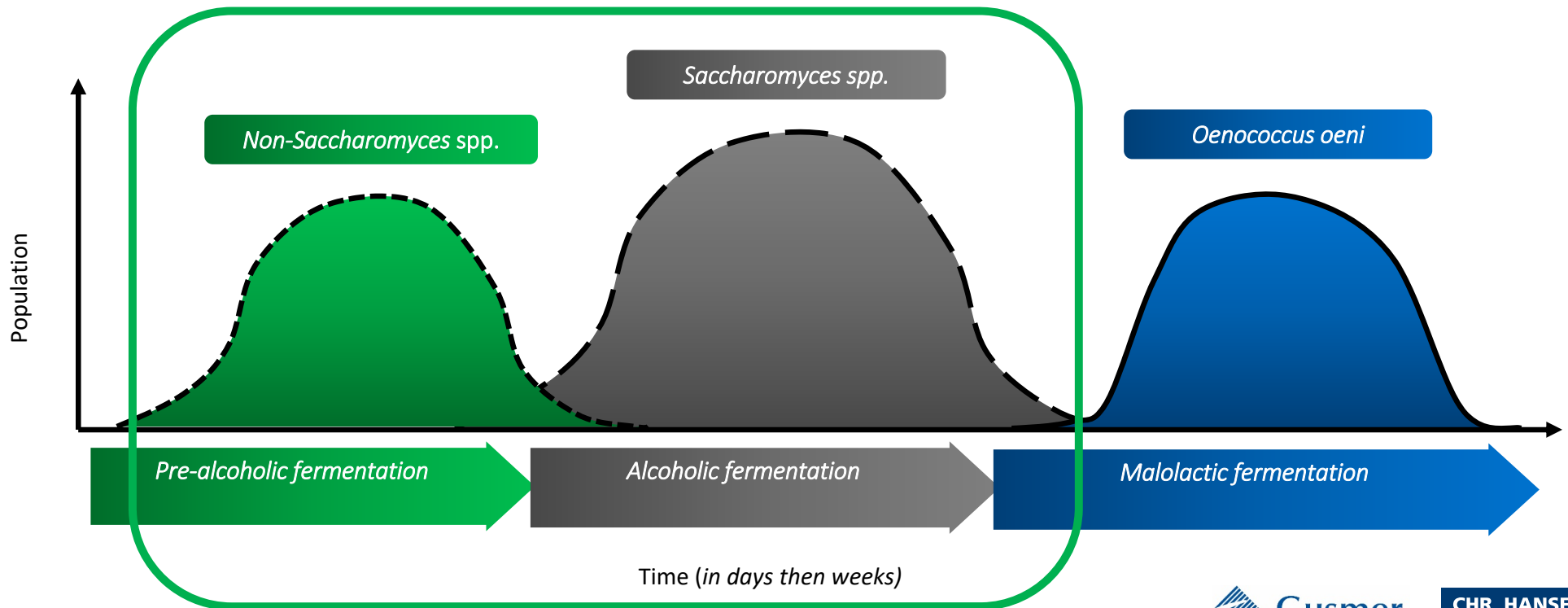
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# Master your population sequence in winemaking





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# Yeast cultures –the toolbox with Non-Saccharomyces, Saccharomyces and blends

Culture	Species	Temp. °C	SO <sub>2</sub> tol. (ppm)	Alc. %	Speed	Features	Description
<b>Pre-fermentative yeasts (non-Saccharomyces)</b>							
<b>FrootZen™ (DVS®)</b>	<i>Pichia kluyveri</i>	15-25	45	6	+	No rehydration needed. Releases thiols; antioxidant.	Provides an intense fruit aroma. Perfect for white, rosé and light red wines.
<b>CONCERTO™</b>	<i>Lachancea thermotolerans</i>	15-25	30	9	+	Naturally restores the ideal acid balance	Increases crispness and freshness, provides light fruity notes. Ideal for wines from warm climates.
<b>PRELUDE™</b>	<i>Torulaspora delbrueckii</i>	10-25	30	10	+	Polysaccharides for wine body, reduces greenness, ideal for cold maceration	Provides rounder mouthfeel with notes of caramel and pastries. Perfect for reds and whites, fermented and aged with oak
<b>OCTAVE</b>	<i>Lachancea thermotolerans</i>	15-25	30	11	+	Strong lactic acid producer	Add acidity and freshness as well as white stone fruit aroma to white and rosé; inhibits spontaneous MLF.



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# Yeast cultures –the toolbox with Non-*Saccharomyces*, *Saccharomyces* and blends

Culture	Species	Temp. °C	SO <sub>2</sub> tol. (ppm)	Alc. %	Speed	Features	Description
<b>All in one (<i>Saccharomyces</i> and non-<i>Saccharomyces</i>)</b>							
<b>MELODY™</b>	<i>Blend</i>	15-28	30	17	++	Mix of three yeasts (60:20:20). Saves preparation time as it covers both pre-fermentation and fermentation.	Increases complexity and mouthfeel. Suitable for both red and aromatic white wines.
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<i>Saccharomyces</i>							
<b>MERIT™</b>	<i>Sac. cerevisiae</i>	15-30	90	17	++	Low SO <sub>2</sub> production, high alcohol resistance	Adds red/black fruit and spicy notes. For medium to heavy bodied reds. Merlot, Cabernet Sauvignon, Shiraz, Carmenère. Also for sparkling wines
<b>JAZZ™ (DVS)</b>	<i>Sac. cerevisiae</i>	10-30	90	17	+++	No rehydration needed. High fermentation speed, strong symbiosis with ML cultures	For reds that embody terroir and elegance. Augments clean and pure notes of fruit. Rhone blends, Syrah, Pinot noir, Grenache, Nebbiolo.



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## Chr. Hansen is the world's most sustainable food ingredient company

- Ranked no. 2 on Corporate Knights' list of Global 100 most sustainable companies in 2020
- Corporate Knights, an independent ranking agency reviews all publicly listed companies globally with > USD 1bn revenue (7,395)
- In 2020, we improved our total score against Corporate Knights' indicators due to our products' contribution to the UN Global Goals and performance on environment and diversity.



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## Emerging challenges set the scene in winemaking



- › Climate change and increase of temperature makes it hard to maintain freshness and low alcoholicity



- › Consumer demand for reduced sulfites is growing but lowering sulfites increased the risk of spoilage microorganisms to proliferate
  - › Sulfites are also less efficient in the context of higher pH linked to global warming



- › Increased competition requires a higher degree of diversification and improved quality



**Adjust your winemaking with pre-fermentative yeasts to meet evolving customer demand, increased competition and adapt to the climate**

#### **A PALETTE OF DIFFERENT PROPERTIES**

- › Adapted to the early stages of vinification, they will influence the final wine characteristics thanks to their specific metabolism

#### **PROTECT THE MUST**

- › Reduce or eliminate sulfites and rely on BioProtection by natural way during the early steps of winemaking

#### **MIMIC A SUCCESSFUL NATURAL PROCESS**

- › Express the true potential of your wine and bring your own signature by increasing complexity while smoothing out year to year fluctuations

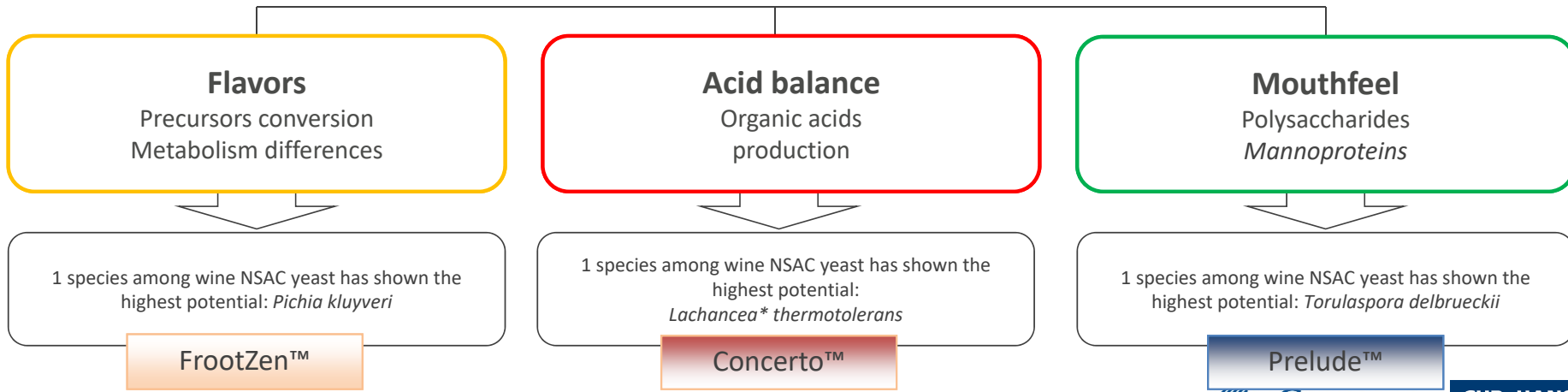
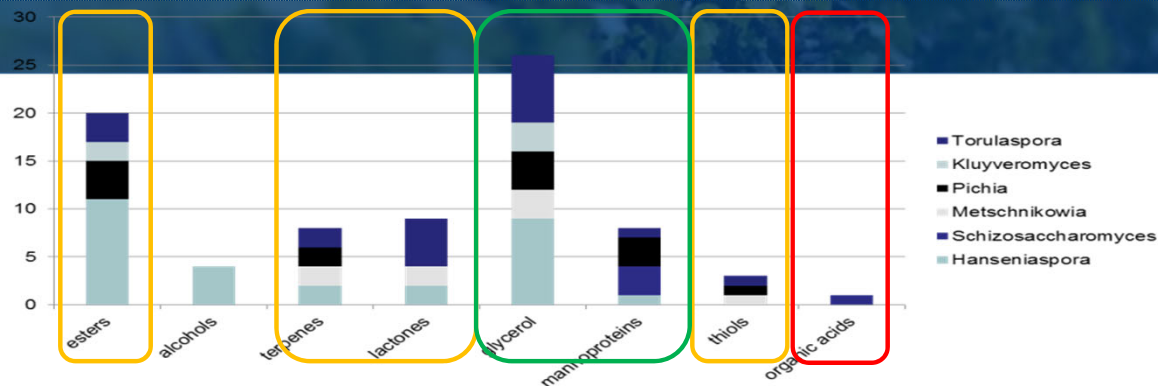


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# Non-Sac yeasts: identify the needs



# Viniflora® Prelude™ (*Torulaspora delbrueckii*)

- First pure NonSac (launched in 2009)

## FEATURES

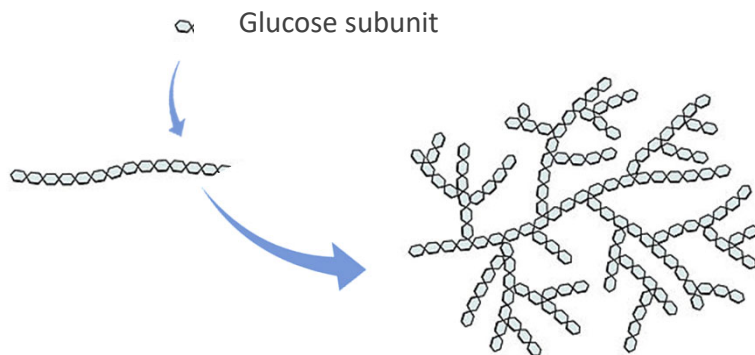
- Improves mouthfeel
- Gives flavor complexity
- Lower VA





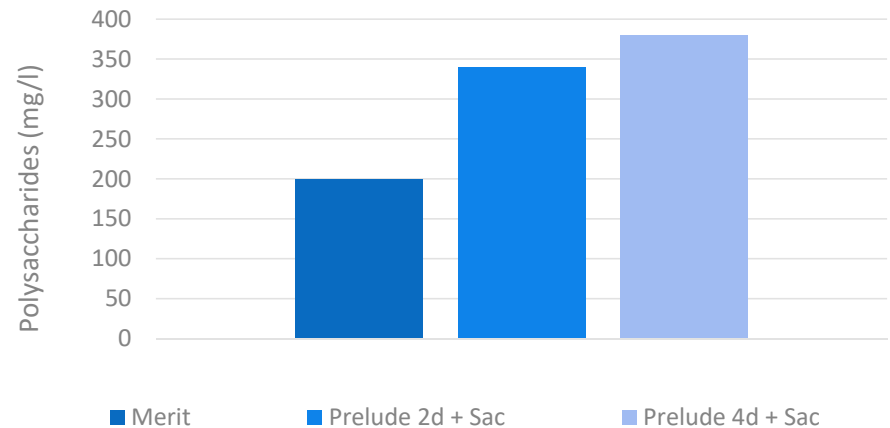
# Viniflora® Prelude™ for increasing mouthfeel

- Selected for its polysaccharide production/release
- A polysaccharide are polymeric carbohydrates that confer texture and viscosity
- add smoothness, roundness and reduce astringency
- The longer Prelude works, the more polysaccharides it releases



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Blend Syrah/**Marselan**



[Appl Microbiol Biotechnol](#). 2018 Apr;102(7):3081-3094. doi: 10.1007/s00253-018-8849-0. Epub 2018 Feb 28.

## The impact of *Torulaspota delbrueckii* yeast in winemaking.

[Benito S<sup>1</sup>](#).

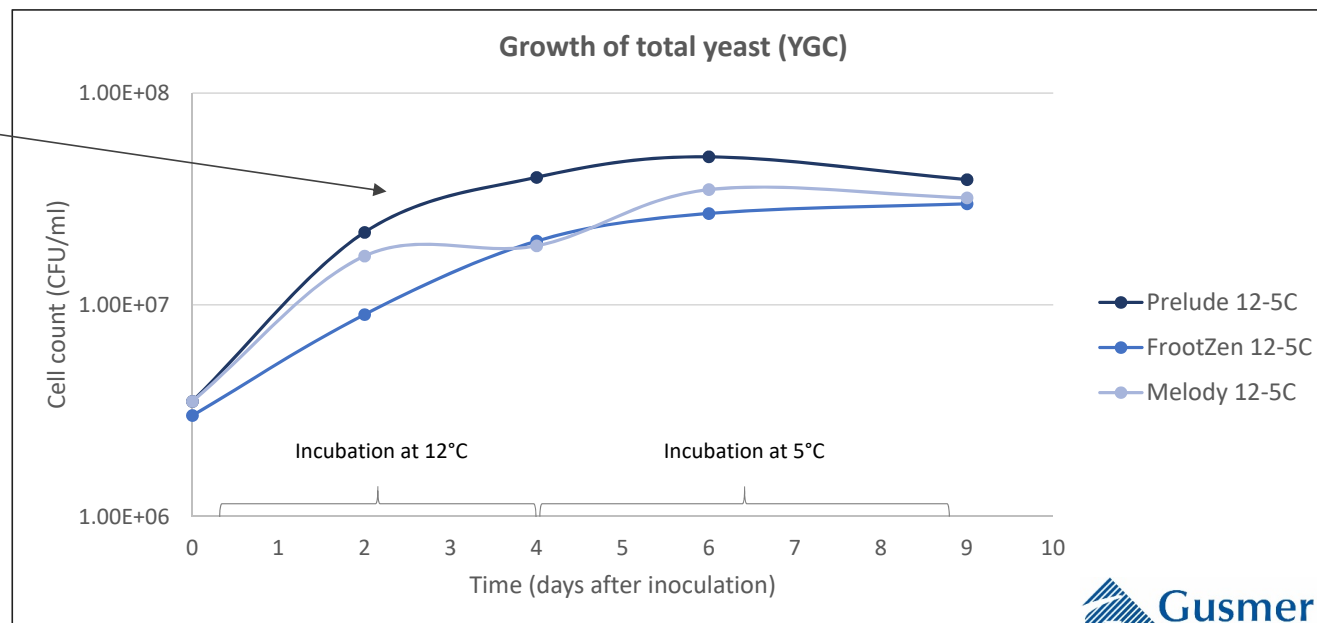
[J Agric Food Chem](#). 2017 Aug 9;65(31):6656-6664. doi: 10.1021/acs.jafc.7b01676. Epub 2017 Jul 26.

**Polysaccharides and Oligosaccharides Produced on Malvar Wines Elaborated with *Torulaspota delbrueckii* CLI 918 and *Saccharomyces cerevisiae* CLI 889 Native Yeasts from D.O. "Vinos de Madrid".**

[García M<sup>1</sup>](#), [Apolinar-Valiente R<sup>2</sup>](#), [Williams P<sup>2</sup>](#), [Esteve-Zarzoso B<sup>3</sup>](#), [Arroyo T<sup>1</sup>](#), [Crespo J<sup>1</sup>](#), [Doco T<sup>2</sup>](#).

# Viniflora® Prelude™ for protecting the wine during cold settling

- Great implantation and growth in musts at low temperatures



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# Viniflora® Prelude™ for avoiding stressful fermentations

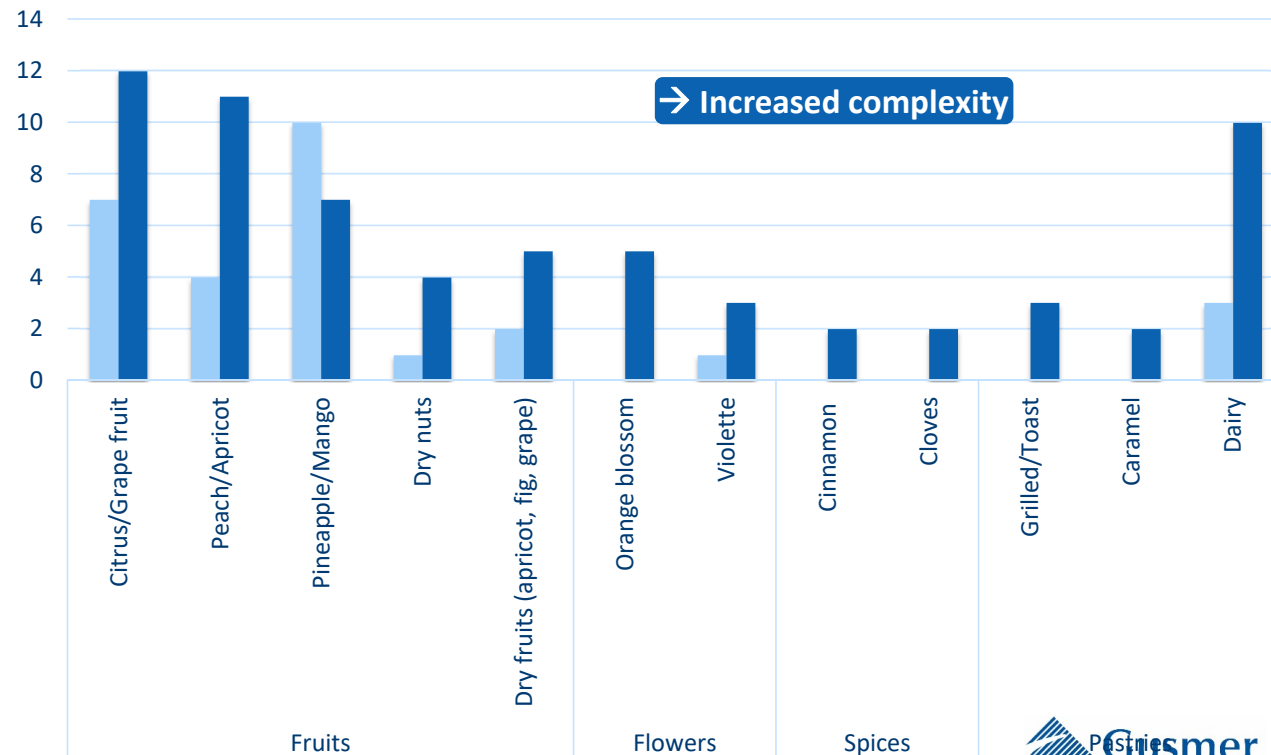


- Osmotolerant → avoids VA and/or fatty acids production from stressed Sac in must with high sugar concentration (> 250 g/L)  
→ Retain malolactic bacteria vitality

	Values at end alcoholic fermentation			
	Acetic acid g/L	Glycerol g/L	Esters mg/L	Fatty acids (C6,8,10,12) mg/L
<i>S. cerevisiae</i> (EC1118)	0.21	6.7	6.3	14.5
<i>T. delbrueckii</i> (Prelude™) + <i>S. cerevisiae</i> (EC1118)	<b>0.06</b>	6.9	7.3	<b>3.5</b>

# Viniflora® Prelude™ to give complexity in Chardonnay

Chardonnay wine tasting with a panel of 18 trained wine tasters focused on aromas & flavors descriptors  
 Numbers indicate a frequency  
 Burgundy, France



PRELUDE™  
+ *S. cerevisiae*

*S. cerevisiae*



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# Viniflora® Prelude™



## STRENGTHS

**Versatile yeast**

**Provides rounder mouthfeel**

**Give aromatic complexity**

**Protects during cold soaking**

## APPLICATION

Red and whites to improve non-fruity complexity

Cold soak both red and white

Reduce VA and FA from Sac and *H. uvarum*

Australia and NZ mainly use Prelude in white wines

In the rest of the world mainly red varieties as Pinot noir, Cabernet franc, Merlot etc.

# Viniflora® FrootZen™ (*Pichia kluyveri*)

- Launched in 2010
- First frozen yeast for direct inoculation
- Low-fermentative → no strong reduction of sugars

## FEATURES

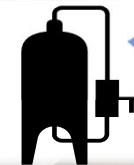
- **Very flavour-active**
- **Bio-protection**



Gathering of islets on the surface



Harvest truck



Tank filling



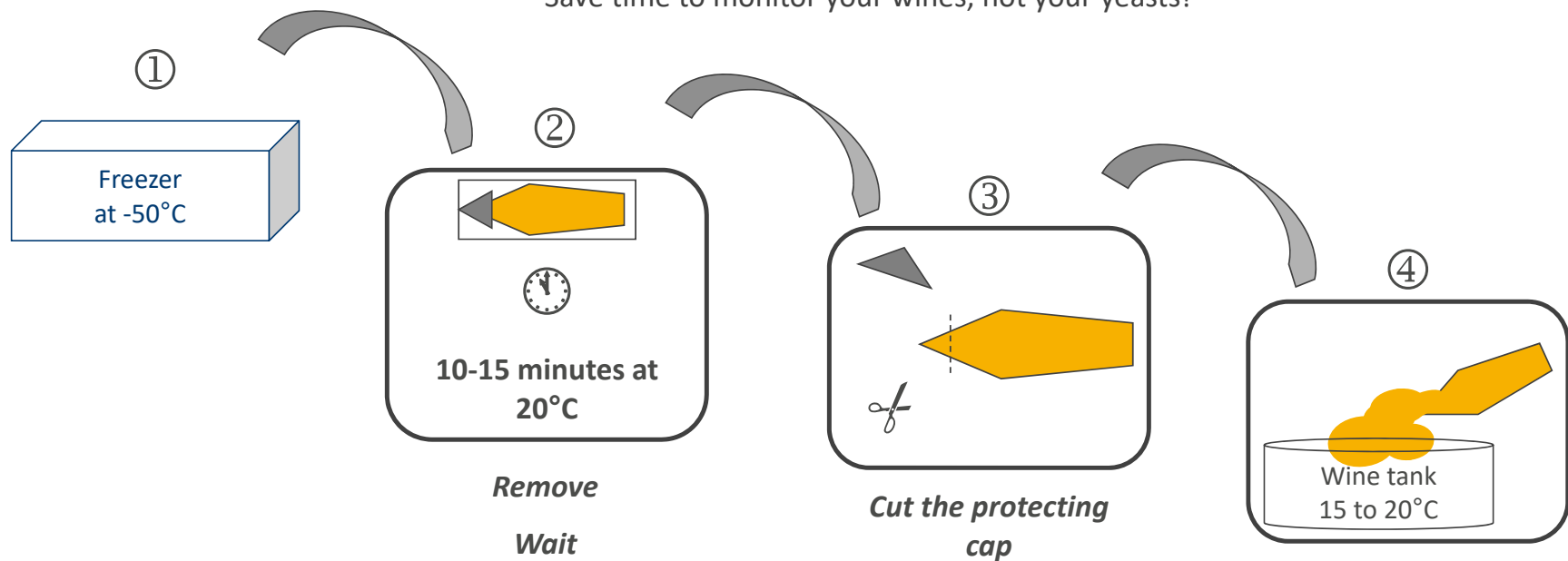
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# FrootZen™: a fast solution for winemakers

- 4 steps to ferment and 15 minutes to prepare
- Save time to monitor your wines, not your yeasts!



*Pour the yeast*  
**Gusner**  
Enterprises, Inc.®

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# FrootZen™: the ideal yeast product for winemakers







## Protection against oxidation

### › VINIFICATION OF WHITES AND ROSÉ WITHOUT SO<sub>2</sub>

Dosage for 1 kg FrootZen for 13 tonnes grapes  
(= 10'000 L juice)

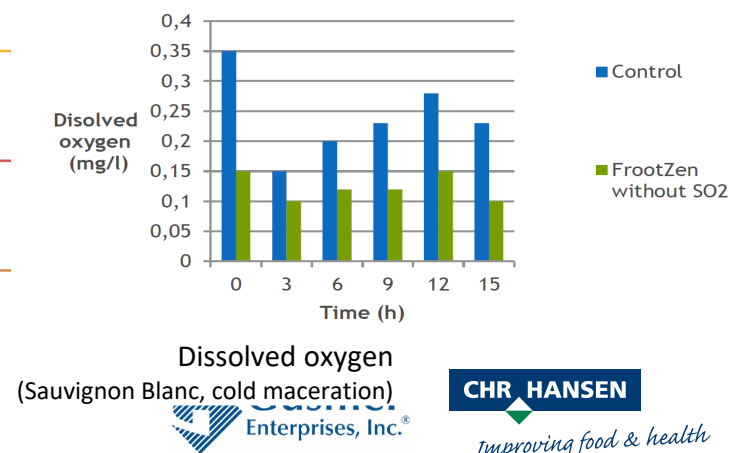
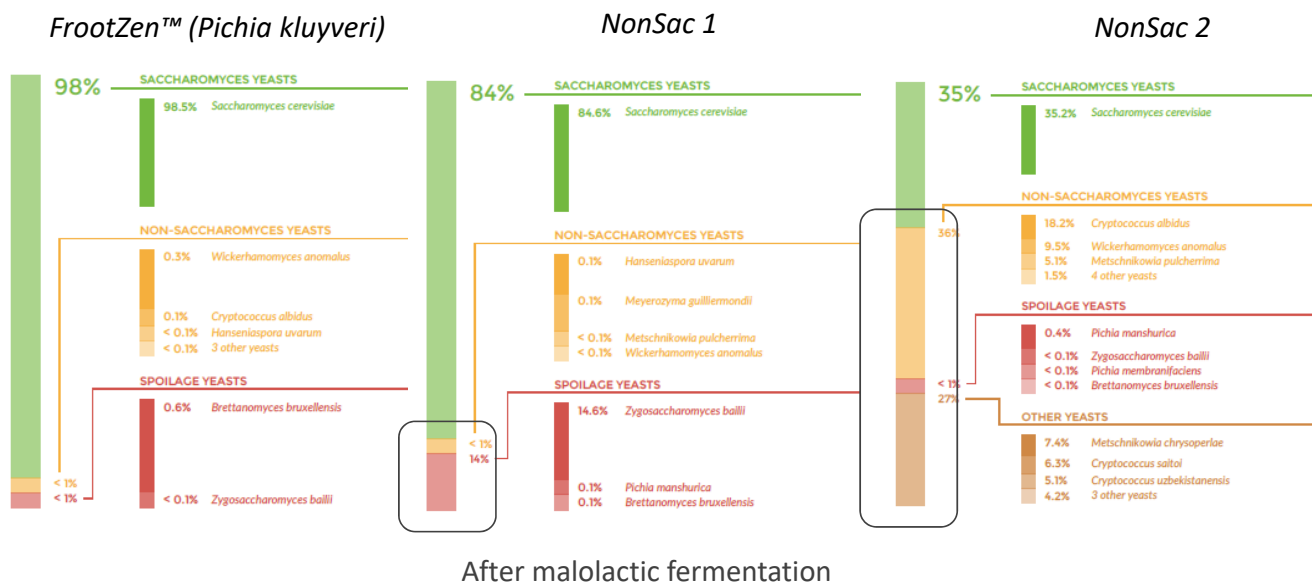
Direct inoculation of the frozen yeast or  
through a solution (water or unsulfited must)  
on the grapes

→ To avoid oxidation

→ To start protecting vs. microflora

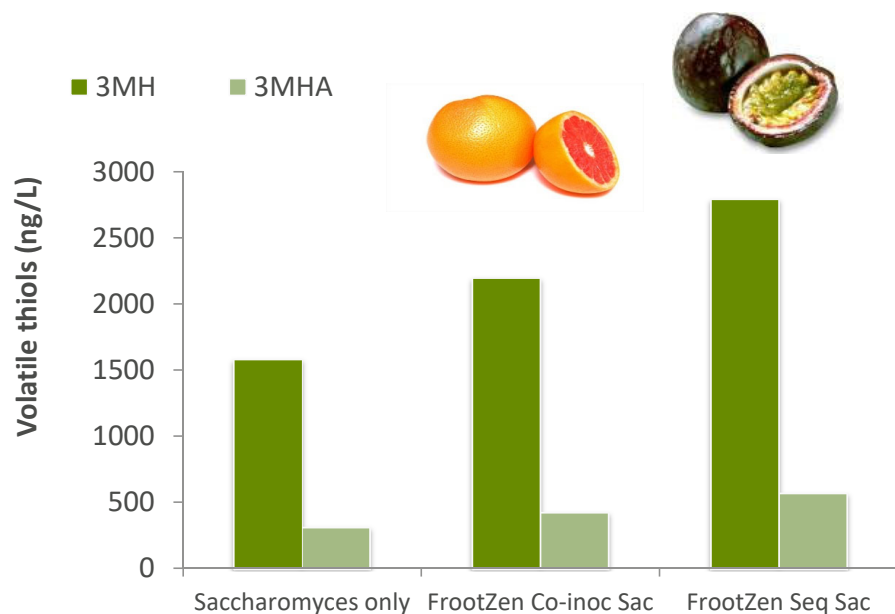
# FrootZen™ reduces the risk of spoilage microorganisms and oxidation

- France 2018: no SO2 Grenache gris (unpasteurized)
  - Inoculation after the harvest machine + after pressing



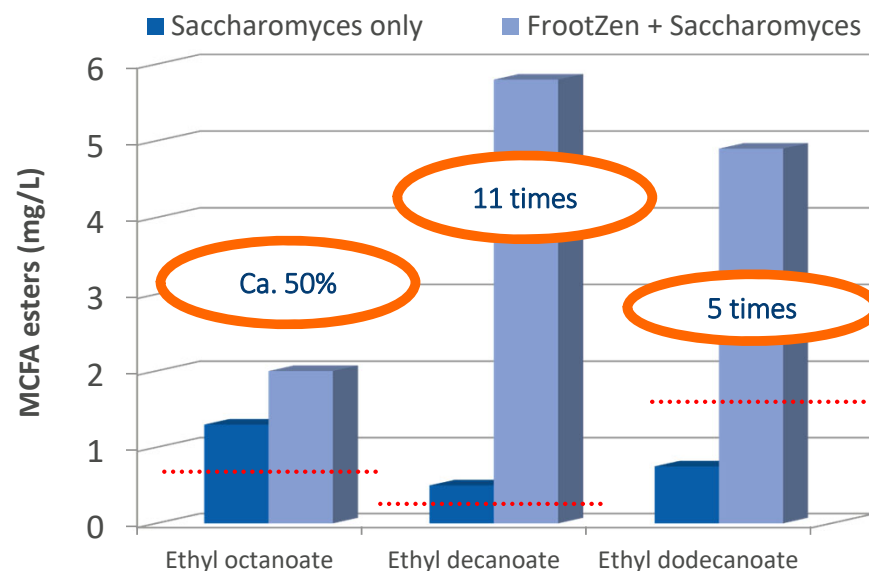


# FrootZen™ improves thiols and MCFA esters release in Sauvignon blanc (NZ)



**3MH: 3-mercaptohexan-1-ol**

**3MHA: 3-mercaptohexyl acetate**



**Ethyl octanoate:** pineapple, brandy, pear

**Ethyl decanoate:** apricot, sweet, brandy

**Ethyl dodecanoate:** waxy, floral



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# Viniflora® FrootZen™: summary of application notes

## STRENGTHS

**Boost fruity aroma in all varieties**

**Bio-protect must at early stages**

## APPLICATION

White, rosé (less in red wine e.g. Pinot noir)

Increase quality of high yield, low aromatic grapes  
(white grapes in warm areas)

Blending tool for high and base white wine

White wines with skin contact (BioP)

Improve color (esp. in No SO<sub>2</sub> rosé)



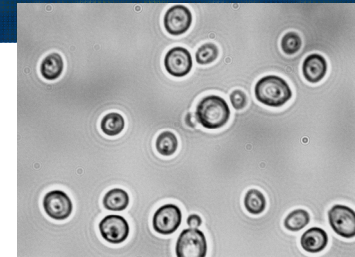


# Viniflora® Concerto™ (*Lachancea thermotolerans*)

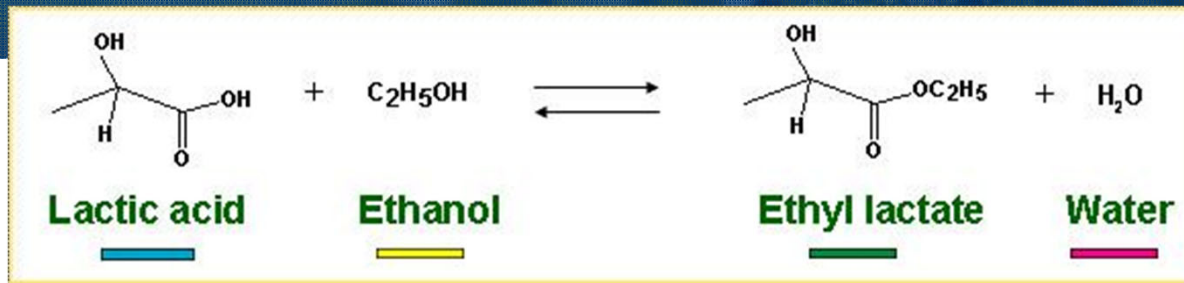
- Launched in 2012
- Formerly *Kluyveromyces thermotolerans*

## FEATURES

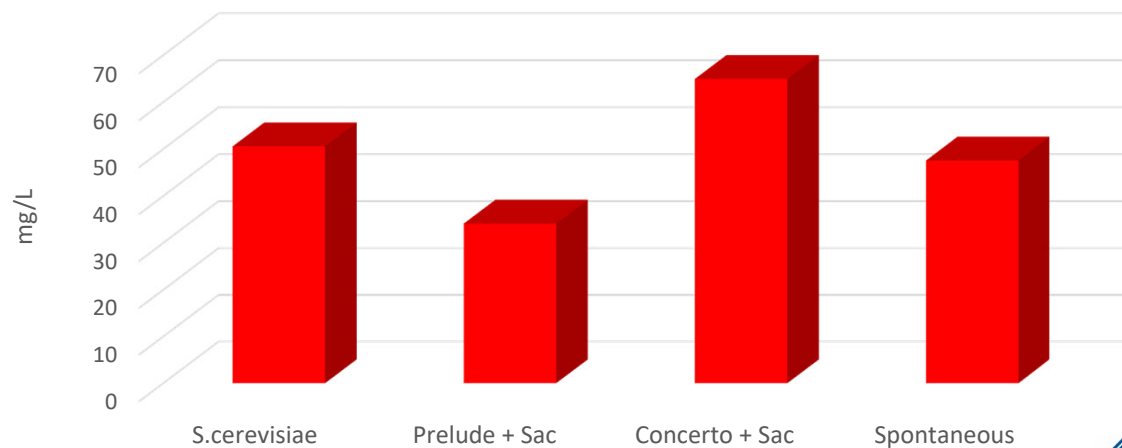
- Improves **acidity balance**
- Reduces (slightly) **alcohol level**
- Produces **fruity esters** (red fruits)



# Viniflora® Concerto™ adds with red berries



Ethyl Lactate





# Viniflora® Concerto™



## STRENGTHS

**Increase freshness through acidity**

**Give freshness through fruitiness**

**Helps in producing wine w/o sulfites**

## APPLICATION

Red wine & fortified wine (e.g., Port)

Thermo-fermented red wine (less cooked profile)

Warm-climate reds for acidity and less ethanol

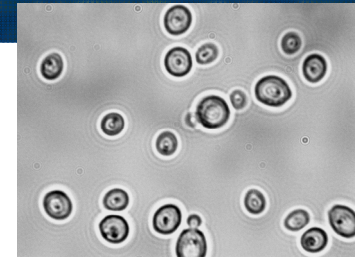
Get additional notes of red/black berries in reds and rosé

# Viniflora® Octave™: the new kid in town

- New *Lachancea thermotolerans* strain
- Launch in NH2020
- For **white** and **rosé** wines

## FEATURES

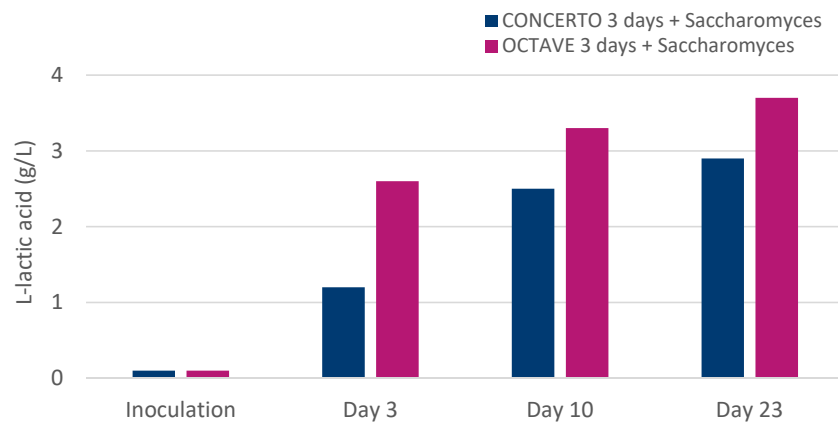
- More **acidity** (pH ↓)
- Less **ethanol**
- Add **white stone fruits**





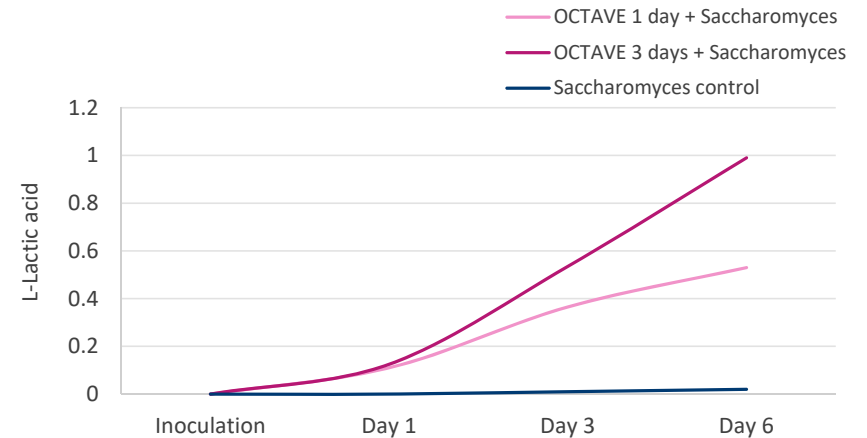
# Increase acidity with natural lactic acid

## LACTIC ACID IN NON-SULFITED ROSÉ WINE



Compared to Viniflora® CONCERTO, OCTAVE is more efficient in releasing L-lactic acid

## LACTIC ACID IN WHITE SPARKLING BASE

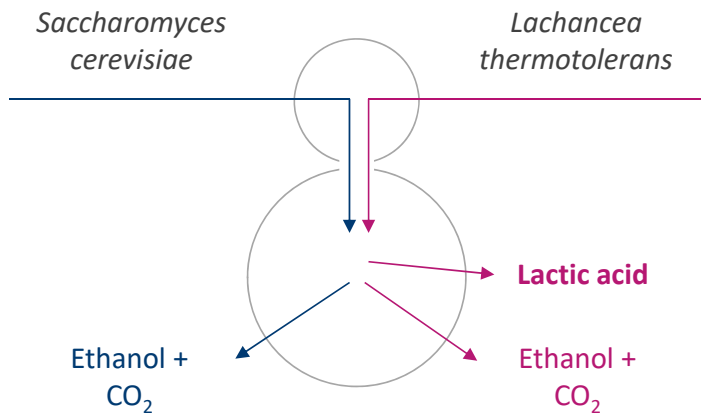


Lactic acid increases stronger during the first week of fermentation, while slowing down in the second phase of alcoholic fermentation

# Decrease ethanol while retaining full flavor complexity

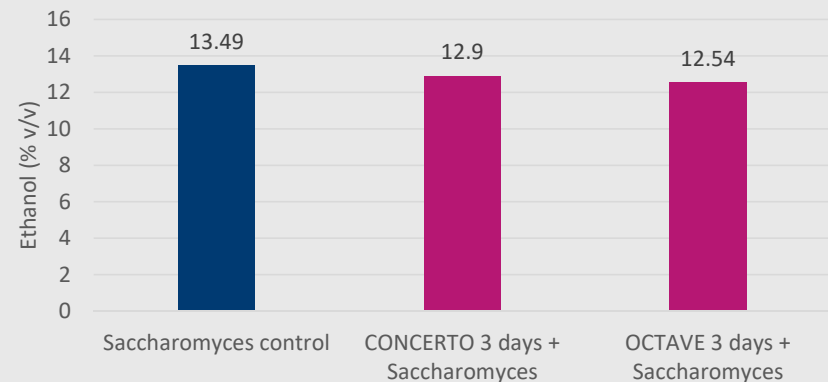
Part of the carbon source like glucose and fructose is dedicated to the production of lactic acid. As a result, ethanol production can decrease.

## ILLUSTRATION OF SUGAR METABOLISM



## ETHANOL IN FINAL WINE

% v/v



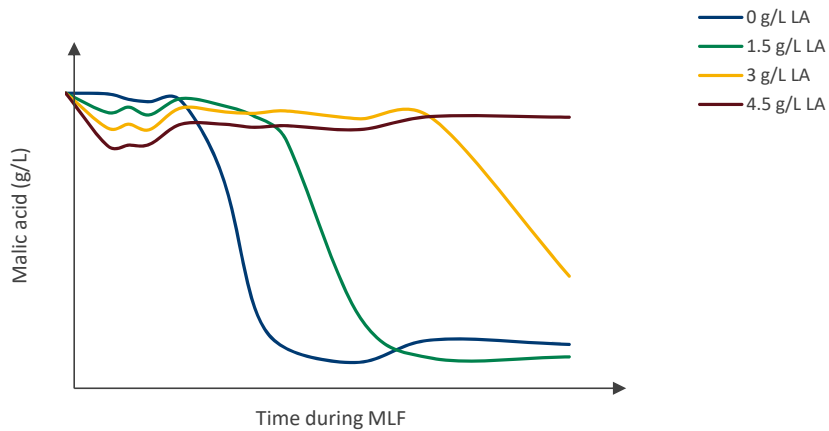
The ethanol reduction can vary between 0.1 to 0.9 % (v/v) units compared to a Sac control, with an average of **0.4 % (v/v)**



# Inhibit spontaneous malolactic fermentation

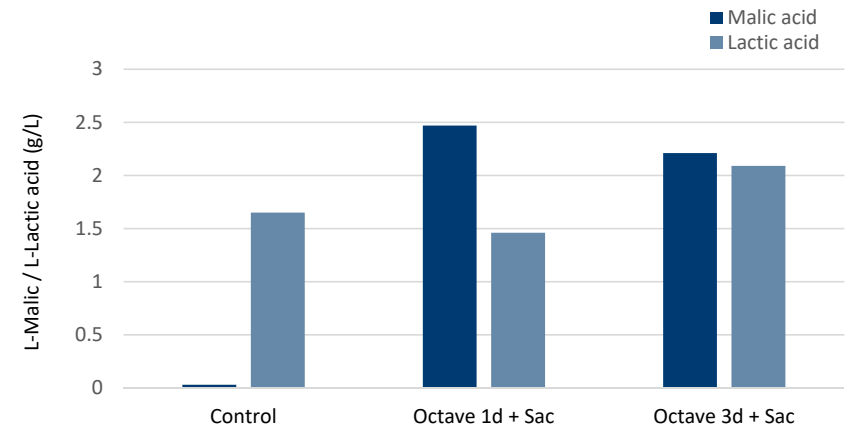
With high pH, malolactic fermentation (MLF) can occur spontaneously before the end of alcohol fermentation and possibly trigger a sensorial defect. When linked with citrate degradation to diacetyl, MLF can give a buttery and fatty flavor that is antagonistic to freshness and masks fruit intensity in white and rosé wines.

## ADDITION OF L-LACTIC ACID



Lactic acid at levels >1.5 g/L are already inhibitory to indigenous malolactic bacteria

## AFTER ALCOHOLIC FERMENTATION



Viniflora® OCTAVE used in pre-fermentation can inhibit the development of spontaneous MLF, keeping most of the malic acid and adding with lactic acid



## Fermentation yeast and blends

### SACCHAROMYCES

- › We offer 2 reliable strains for a robust alcohol fermentation and respect of varietal character

### DIRECT INOCULATION

- › Our strain JAZZ is a strain developed for direct inoculation in must, for an efficient fermentation and a lift of fruit character.

### BLENDS

- › All in one blends are user friendly cultures that leverage the possibilities by combining Non-saccharomyces and Saccharomyces at a low cost in use.



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# Viniflora® Melody™ - the 3-in-1 solution

- **A blend for complexity, mouthfeel and convenience**
  - 20% *Torulaspora delbrueckii* (Prelude™)
  - 20% *Lachancea thermotolerans* (Concerto™)
  - 60% *Saccharomyces cerevisiae* (Merit™)
  
- Prelude™ for mouthfeel and secondary flavors
- Concerto™ for acidity, structure and esters (red berries)
- Merit™ for alcoholic fermentation
  
- Saves preparation time as it covers both pre-fermentation and fermentation

*In addition to well mastered alcohol fermentation, MELODY™ increases the aromatic complexity of wine and brings it a round mouthfeel*



**Melody** use to be sold mainly for Chardonnay

- However, over the recent years it has become increasingly popular in many red varieties e.g. Shiraz, Grenache and Mourvèdre

# Viniflora® blends - the convenient solution

- Blends for adding complexity, mouthfeel and convenience
- Saves preparation time as it covers both pre-fermentation and fermentation
- Prelude™ for mouthfeel and secondary flavors
- Concerto™ for acidity, structure and esters (red berries)
- Merit™ for alcoholic fermentation



*MELODY™ increases the **floral and tropical fruit aromas** in dry white wines and brings it a **round mouthfeel***



*Rhythm™ is an excellent choice for **fruit forward** dry red wines and produces round, rich flavors with notes of **blackberry and dark fruit**.*



*Harmony™ is the right product for white or red wines that demand **subtle but multi-dimensional** differences.*



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Culture	Species	Temp. °C	SO <sub>2</sub> tol. (ppm)	Alc. %	Speed	Features	Description
<i>Saccharomyces</i>							
<b>MERIT™</b>	<i>Sac. cerevisiae</i>	15-30	90	17	++	Low SO <sub>2</sub> production, high alcohol resistance	Adds red/black fruit and spicy notes. For medium to heavy bodied reds. Merlot, Cabernet Sauvignon, Shiraz, Carmenère. Also for sparkling wines
<b>JAZZ™ (DVS)</b>	<i>Sac. cerevisiae</i>	10-30	90	17	+++	No rehydration needed. High fermentation speed, strong symbiosis with ML cultures	For reds that embody terroir and elegance. Augments clean and pure notes of fruit. Rhone blends, Syrah, Pinot noir, Grenache, Nebbiolo.



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Thank you  
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