IOC

Révélons votre différence

17/01/2024, Alzey

THE SCIENCE BEHIND CHAMPAGNE EXCELLENCE

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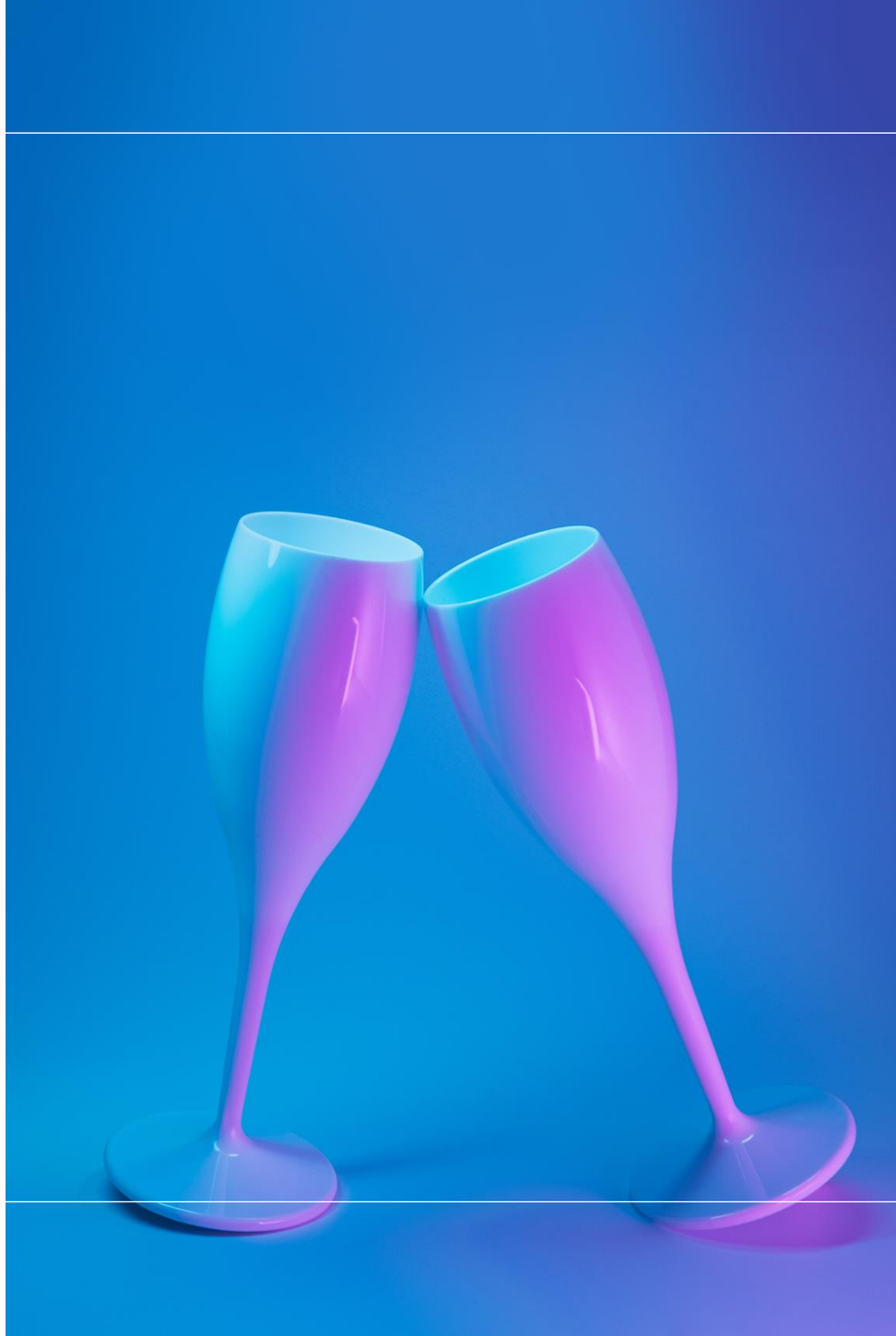
Pierre DE CAFFARELLI
Blandine LOURDELET



WHO ARE WE?

BLANDINE

OENOLOGIST

EXPORT AREA MANAGER

PIERRE

OENOLOGIST

WINEMAKING CONSULTING

THE INSTITUT OENOLOGIQUE DE CHAMPAGNE

Oenological products

Winemaking consulting

Oenological laboratories

Winemaking services

Winemaking technologies

OUR HISTORY

1890 — Creation of the General Warehouse in Champagne

Creation of the General Warehouse in Champagne for the production and packaging of wine products. Marketing of the first oenological products.

1905 — Birth of the IOC

Creation of the Institut Œnologique de Champagne (IOC) and of the first laboratory carrying out selection and preparation work on yeasts.

1980 — R&D Developpement

Creation of a microbiology laboratory putting in place a research and development team.

1983 — Marketing of IOC 18-2007 yeast

Marketing of the first active dry yeast IOC 18-2007, the reference yeast for sparkling wines across the world.

1992 — Site development

From 1992, several laboratories were set up in other French wine regions.

2008 — Takeover of the IOC Group

Takeover of the IOC group by Lallemand, specialty yeast producers.

2011 — Merger of companies

Merger of the IOC Group companies and take over of PERDOMINI-IOC in Italy and IOC Enotecnia in Spain.

2018 — Takeover of the IOC Limoux Laboratory and Silmo

Takeover of the oenological laboratory Oeno 2000 in Limoux and Silmo, a company specializing in flotation and filtration.

2022 — Purchase of the Laboratory IOC Alsace

Creation of the oenological laboratory in Sélestat.

THE LALLEMAND GROUP

Founded in Montreal by Fred A. Lallemand at the end of the
19th century

Yeast production since
1923

More than 4,500 employees
worldwide

48 production plants of which
27 for yeast and
9 for bacteria

A worldwide presence

Owned by the Chagnon family since
1952

45

WINE EXPERTS

57

COUNTRIES

9

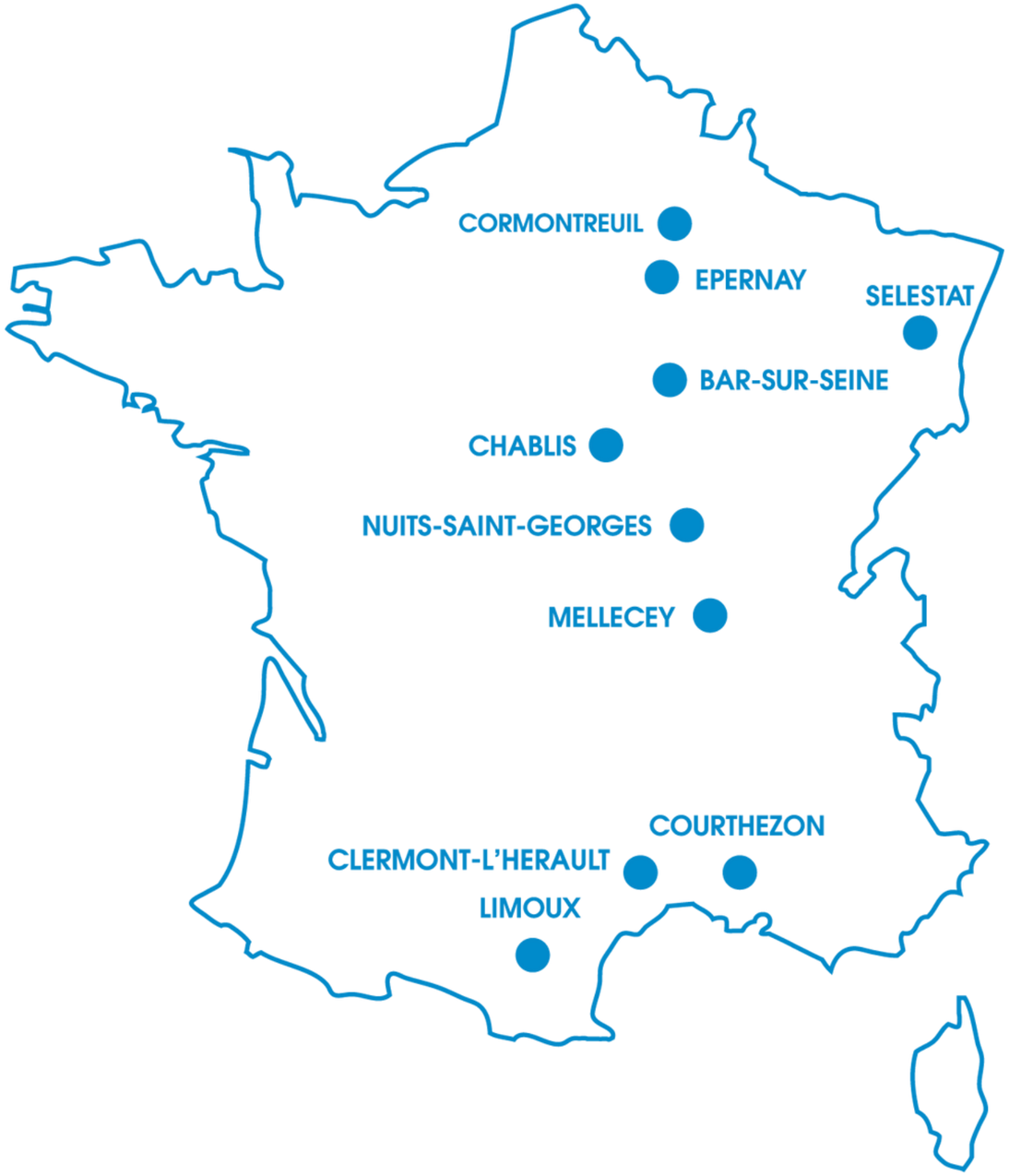
LABORATORIES, of which
5 are Cofrac accredited

18

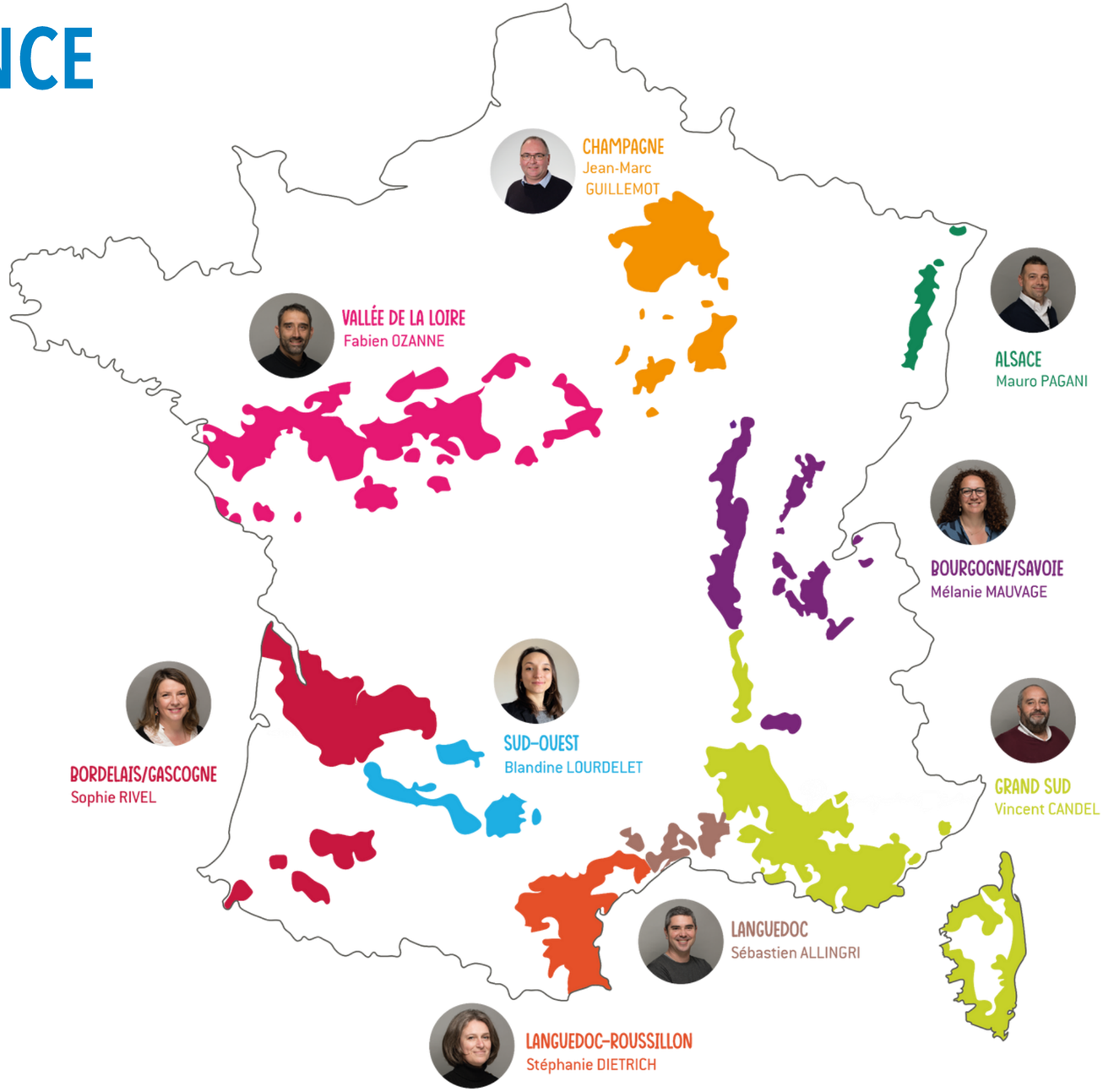
EMPLOYEES

IOC
Révélons votre différence

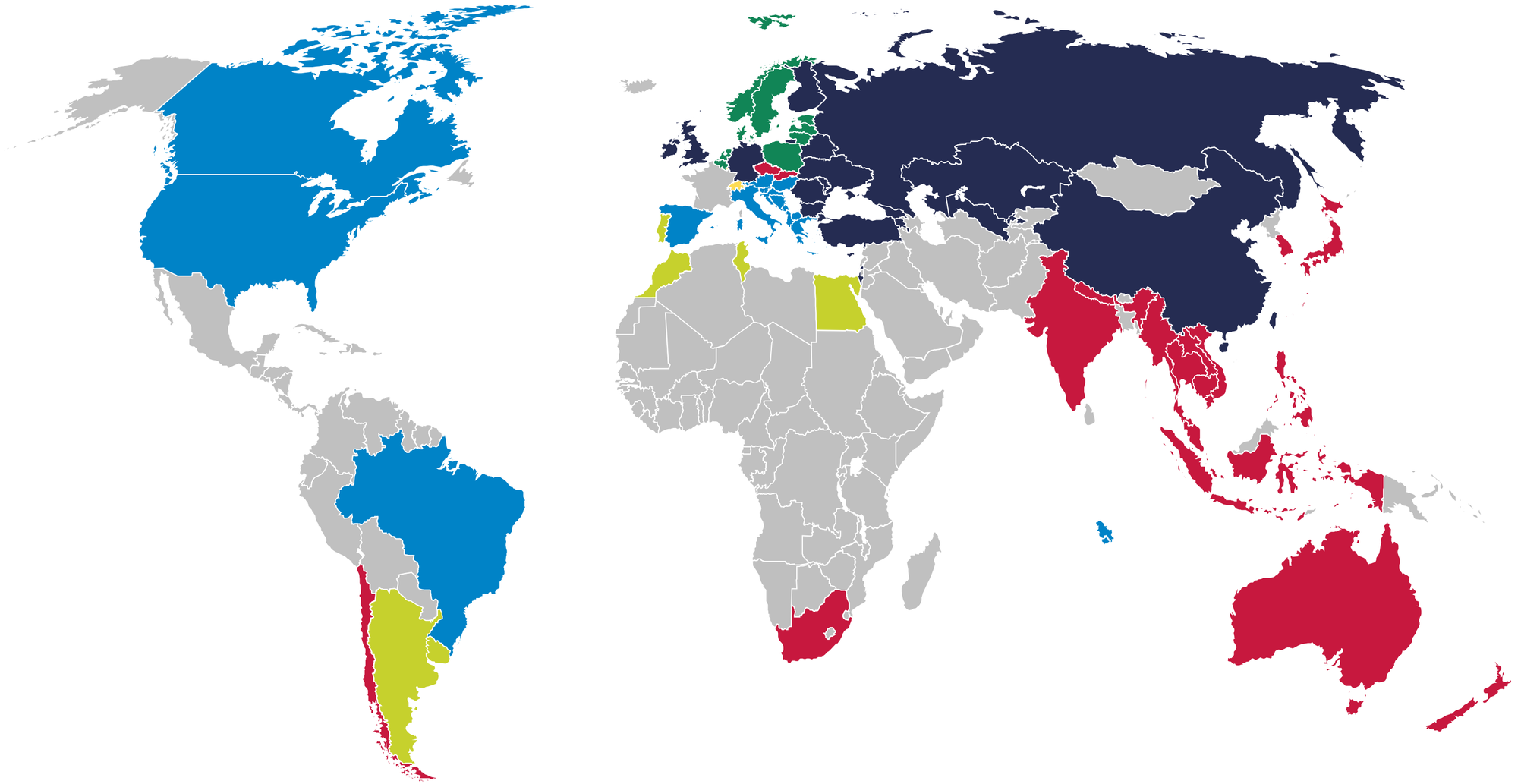
OUR SITES


CORMONTREUIL
EPERNAY
SELESTAT
BAR-SUR-SEINE
CHABLIS
NUITS-SAINT-GEORGES
MELLECEY
COURTHEZON
CLERMONT-L'HERAULT
LIMOUX

OUR SALES TEAM FRANCE



OUR EXPORTATION TEAM



Jean-Pierre VALADE

Alain BOURGEOIS

Blandine LOURDELET

Jean-Marc GUILLEMOT

Mauro PAGANI

FILIALES IOC

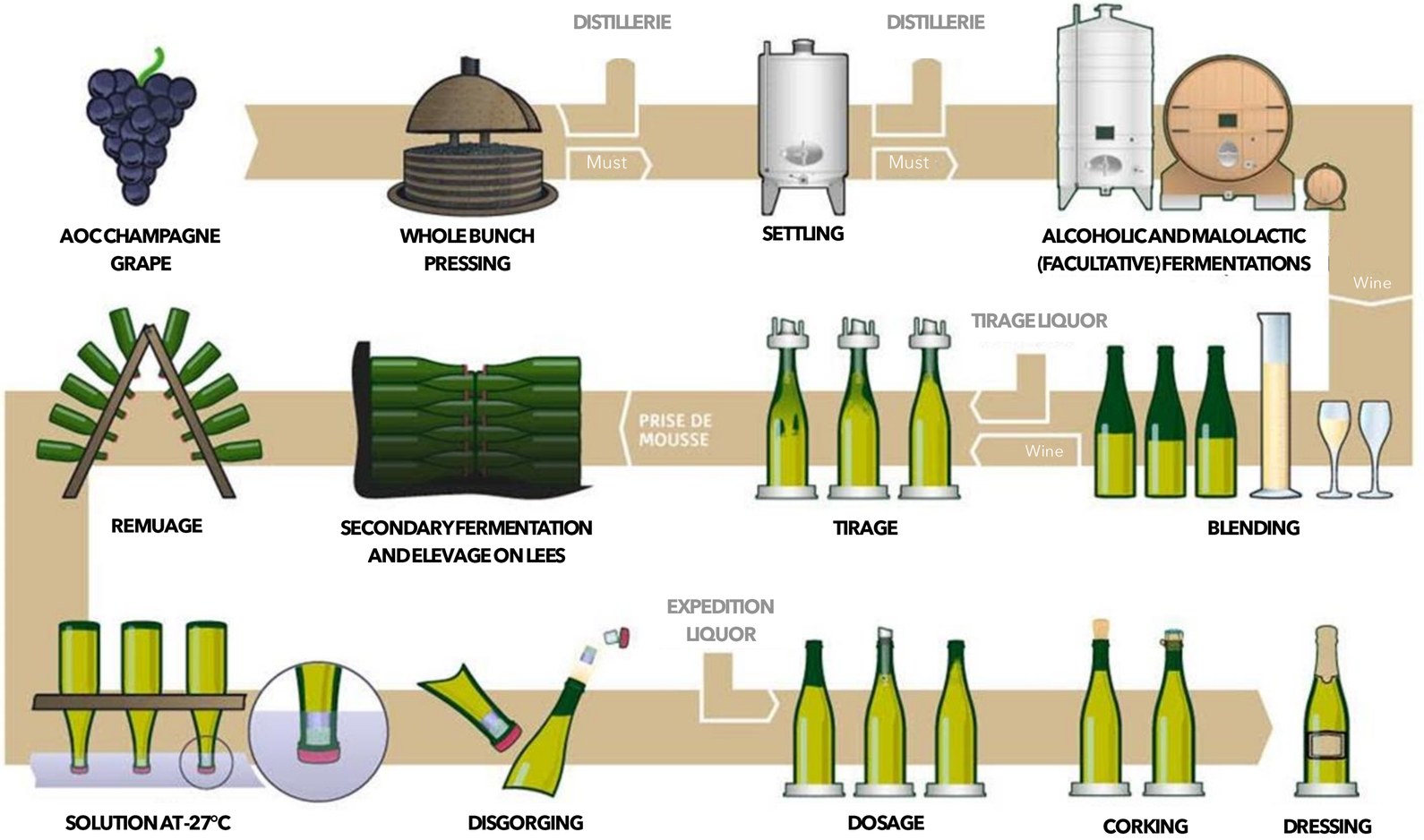
CONTENT

KEY STRATEGIES IN CHAMPAGNE ELABORATION

1/ HARVESTING
2/ CHAMPENOIS PRESSING
3/ BASE WINE ELABORATION
4/ TIRAGE
5/ DISGORGING

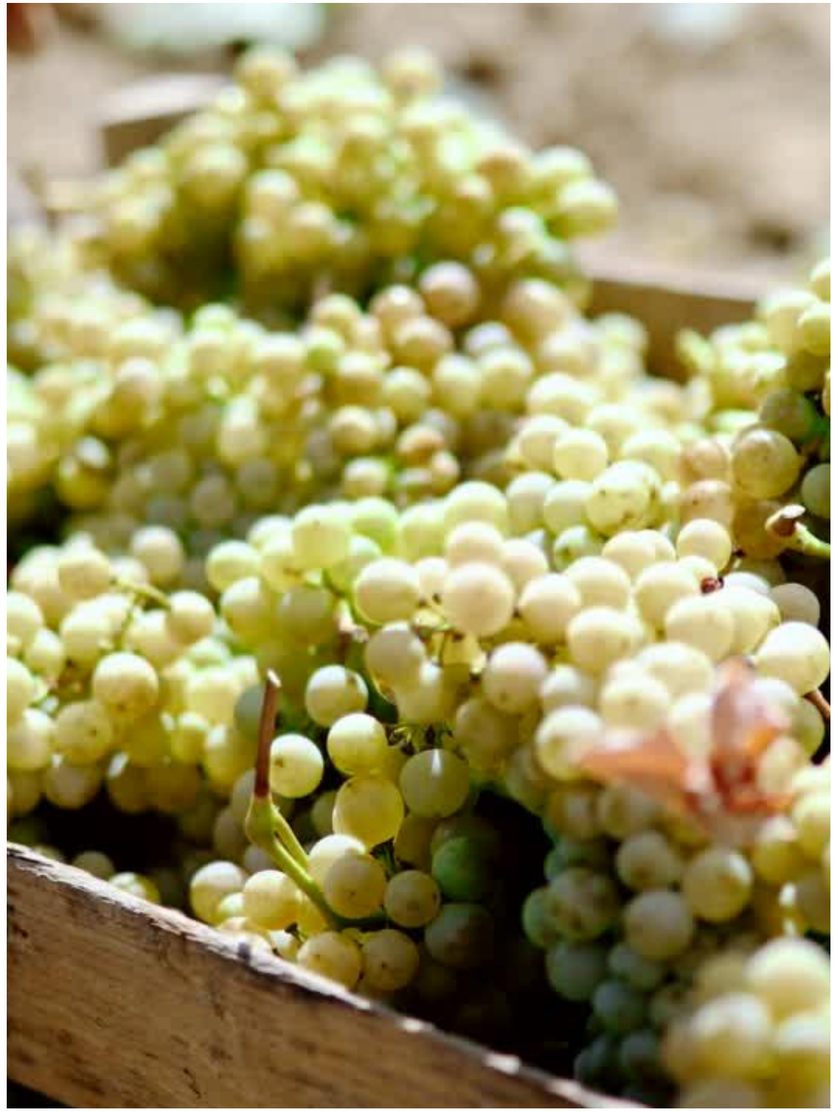
Pierre DE CAFFARELLI

Traditional method in Champagne



CONTENT

1/ STRATEGIC SCHEDULING: HARVEST DATE DETERMINATION



Determination of the harvest date

Analytical balance of grapes:

- **Sugar**: 160 - 180 g/L
- **TAVP**: 10 - 10,5%
- **pH**: 3,0 - 3,2
- **Total acidity**: 6 - 10 g/L (sulfuric acid)
- **Malic acid:** 4 - 7 g/L
- **Maturity Index**: 20 - 22 g of sugar / g of H2SO4

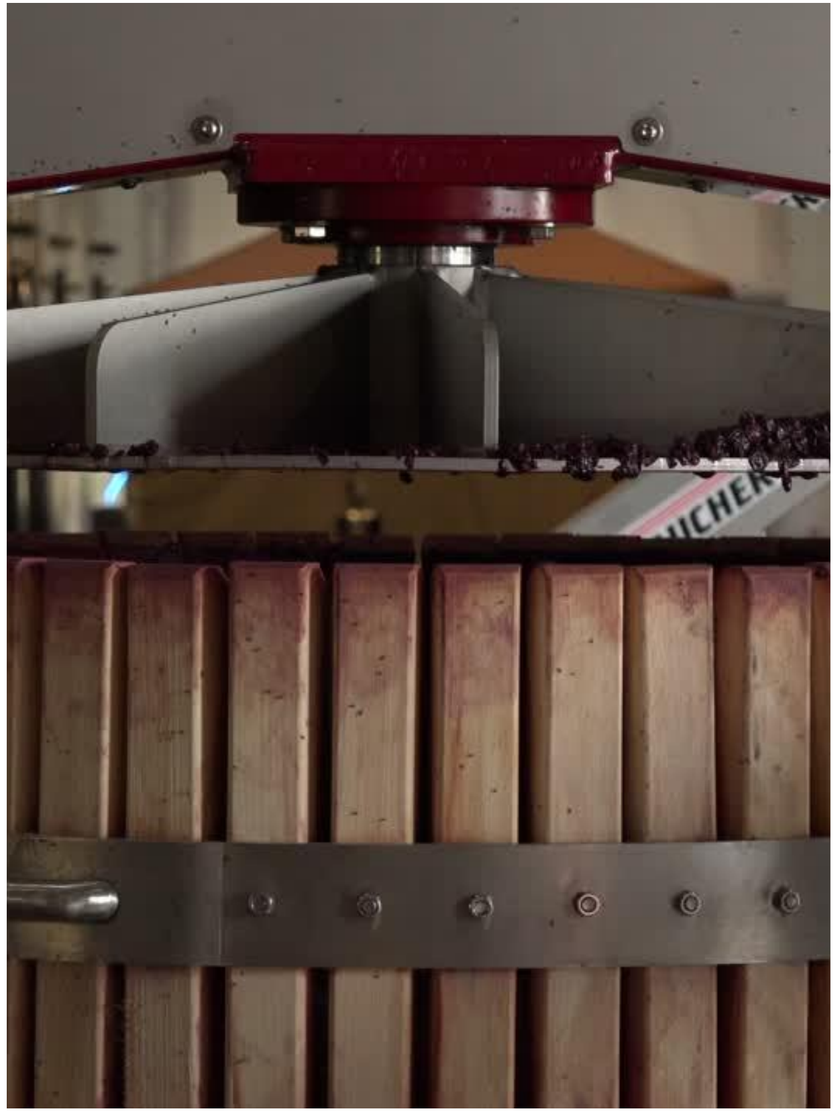
Manual Harvesting in Perforated Crates

Determination of the harvest date

	Total acidity (H2SO4)	pH	Malic acid	Total acidity (H2SO4) post FML	pH post FML	Maturity Index	Alcoholic degree expected
Example 1	8,1	2,95	6,5	5,67	3,19	20	9,65
Example 2	9,85	2,86	7,5	7,05	3,14	16	9,65
Example 3	6,2	3,1	4	4,71	3,25	26	9,65

CONTENT

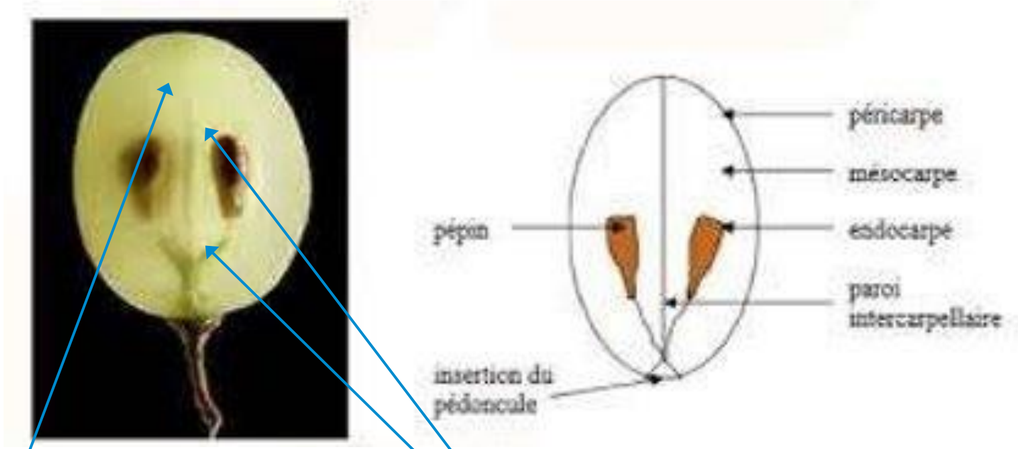
2/ TRADITIONAL METHOD PRESSING: A KEY STEP FOR OPTIMIZED GRAPE QUALITY



Pressing

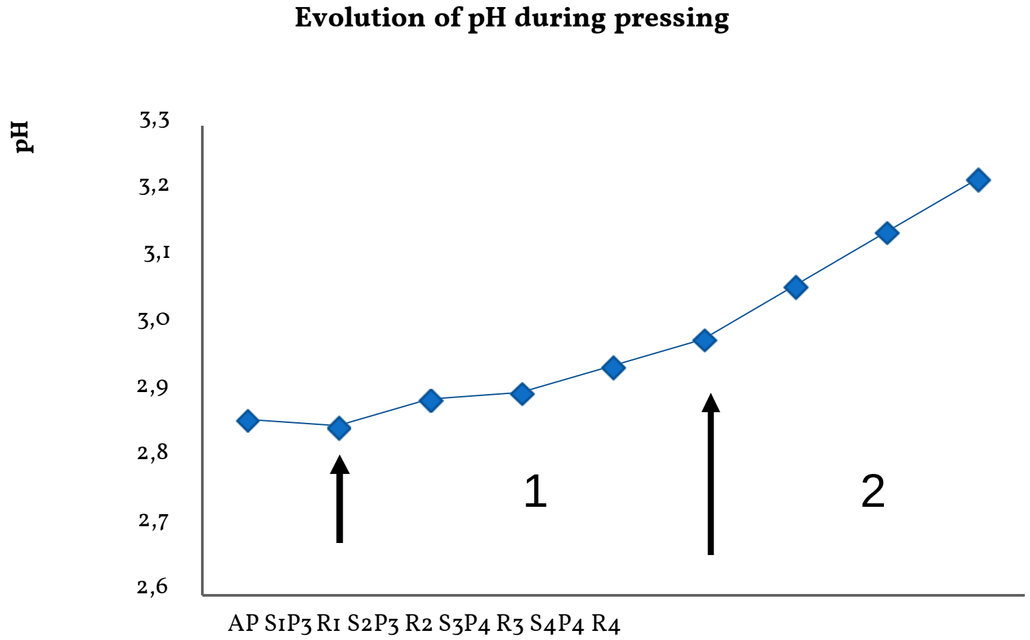
- The pressing stages
- The pressing cycle
- Press fractionation
- Pre-fermentation treatments

The pressing stages

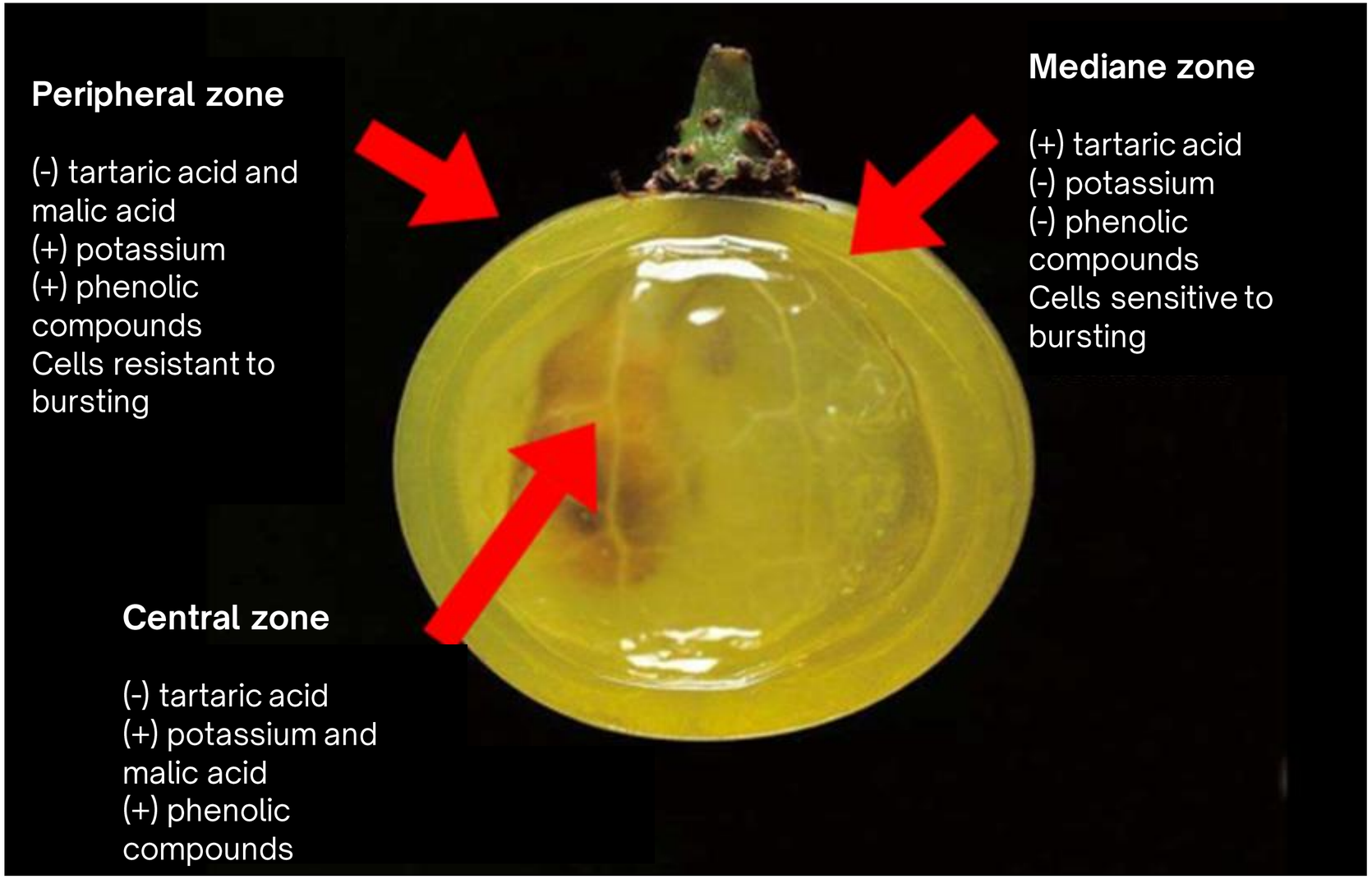


- **1. Clearest and finest juices**
- Pressing from inside the bay: Start / Heart of the Cuvée

- **2: More aromatic, less fine juices, rich in tannins and potassium**
- End of pressing, from the highest pressures



Distribution in the bay



Source: Champagne Committee

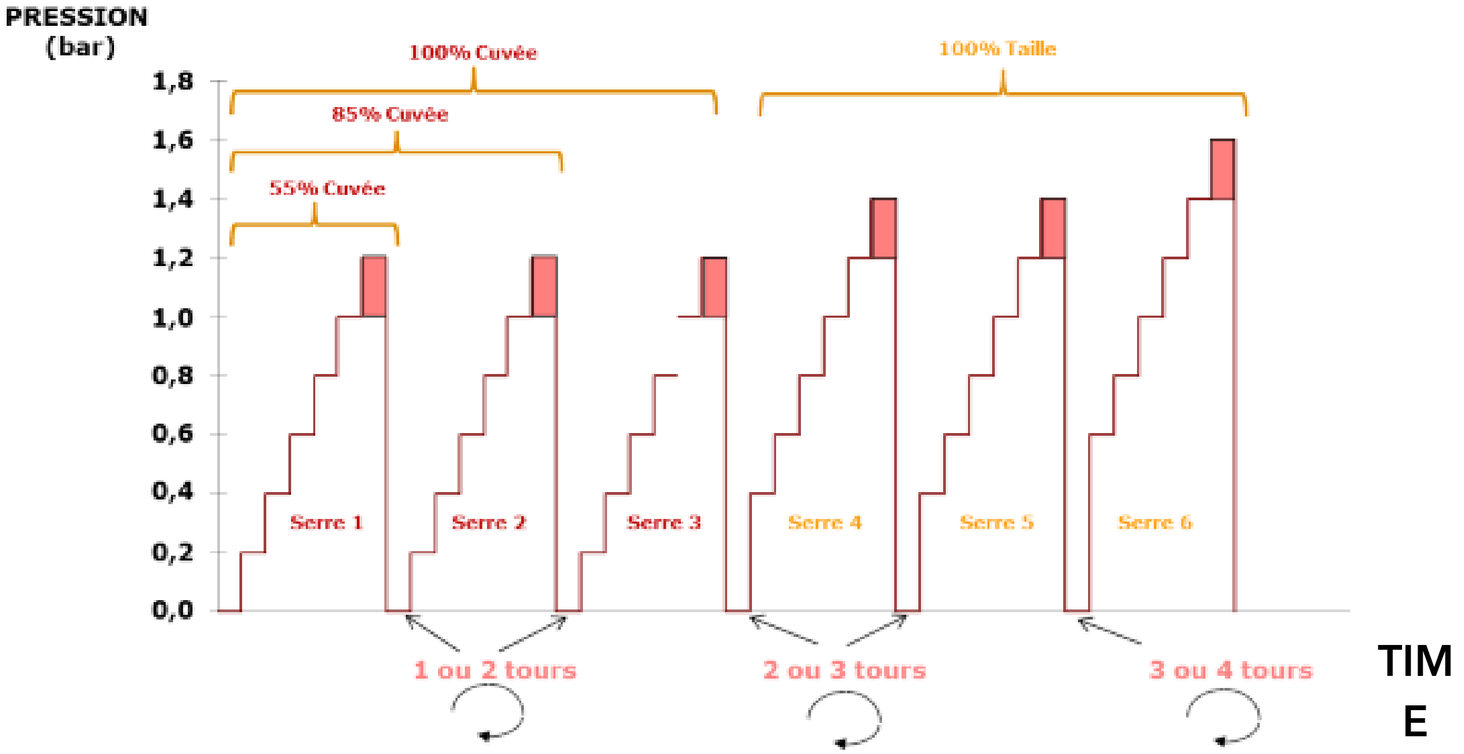
Champenois pressing

PRESSING = BIRTH OF THE WINE
The champagne pressing unit = 4,000 kg

TOTAL BEFORE SETTLING: 26.56 hL
Representing a yield of 64%

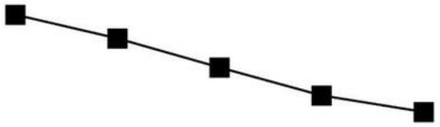
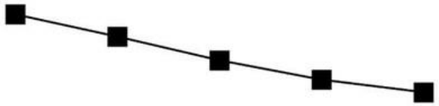
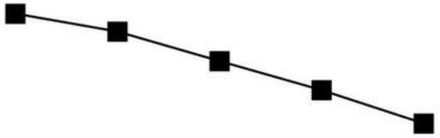
TOTAL AFTER SETTLING:
- Cuvée: 20.50 hL
- Taille: 5 hL

The pressing cycle

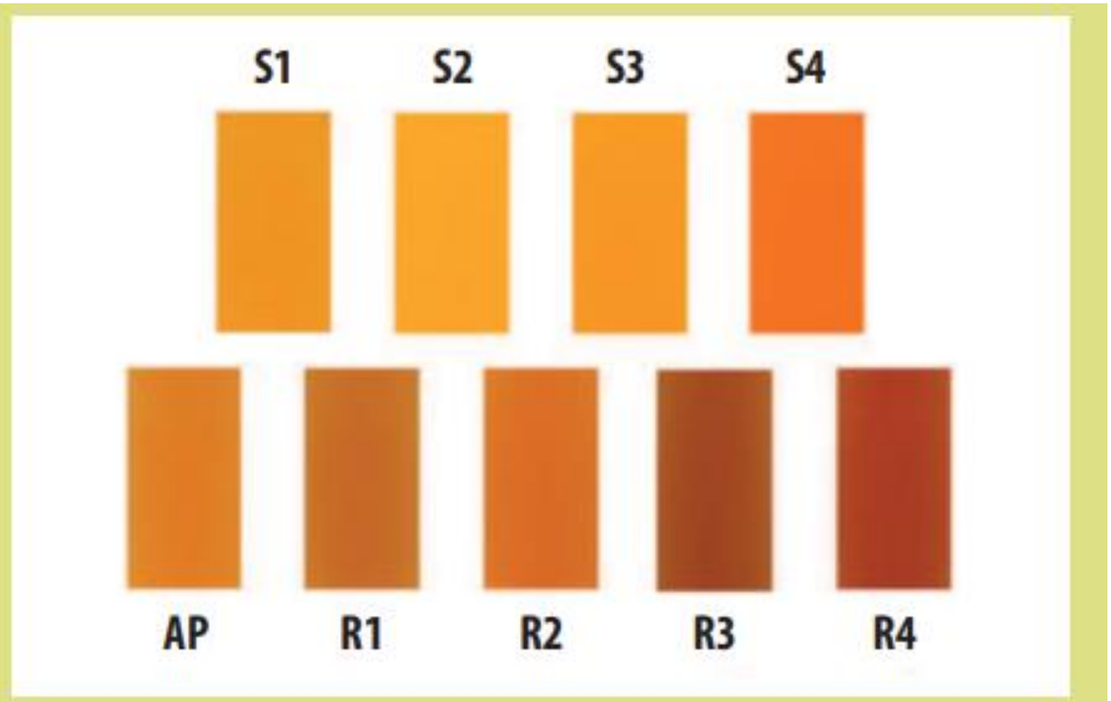


Source: Champagne Committee

The pressing cycle

D S1–S5	Must	Wine	Evolution during pressing
TAP / TAV	- 1 %	0 %	
Total acidity	- 35 %	- 35 %	
Malique acid	- 30 %	- 26 %	
Tartaric acid	- 29 %	- 50 %	
pH	+ 0.30 units	+ 0.35 units	

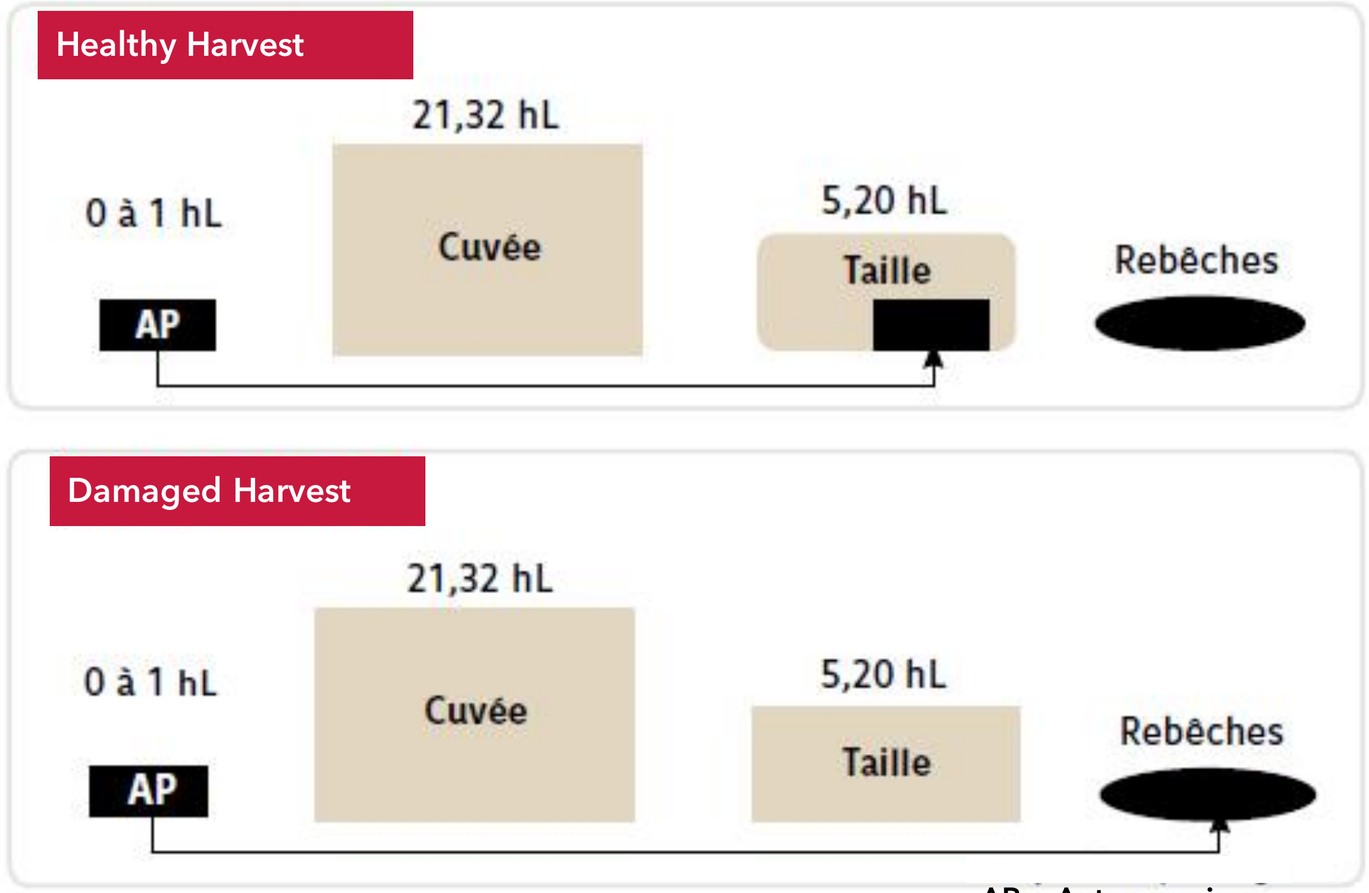
The pressing cycle



Variation in the color of the juice 12 hours after pressing (Pinot noir de l'Aube - AP = Auto pressing, S = pressing cycle, R = Rebêche). The samples are centrifuged and filtered.

Juice splitting

Example: extraction of 26,52hL of AOC Champagne juice for 4 000kg of grape (4% of lees)



AP = Auto pressing

In practice :

End Press Juice and lees

Assembling fractions

Specific settling

Wines with low aging potential
(no elevage)

Press Heart / Cuvée

Base wines
(purity/fineness)

End of Cuvée / Taille

Specific settling

Wines for aging
(barrel maturation)

Pre-fermentation treatments

To be preferred because more effective and less impactful than treatments on wines (for example the management of earthy musts and/or ACF)

The “Cuvée” juices (first two pressing cycles):

- Usual itinerary: *enzymage, sulfiting, tanning* (unnecessary discoloration)
- During the settling phase: *bentonite* or *anti-oxidant product* depending on the case

The “Taille” juices (continuation of presses, draining/self-pressing juices):

- Usual itinerary: *enzymage*, sustained *sulfiting*
- During the settling phase: **systematic treatment** (oxidation, vegetal notes / bitterness)
  - **Qi N[oOx]** / **QI FINE** or PVPP and derivatives

We will remain attentive to the concept of pH at the end of pressing.

Sulfiting

- **Continuous sulfiting**
  Favor the arrival of juice from the bottom of the belon to limit SO2 losses through volatilization

- **Manual sulfiting**
  Add the SO2 several times during the flow to better distribute it in the must. Stir the entire fraction, after draining and before pumping to the settling tanks to homogenize the SO2 in the juice.

- **Delayed sulfiting**
  We recommend this technique only on the Taille of black grape varieties. It makes it possible to limit the use of oenological charcoal. It consists of sulfiting the Taille fraction only after its total flow into the belon, or just before or during its transfer to the settling tank.

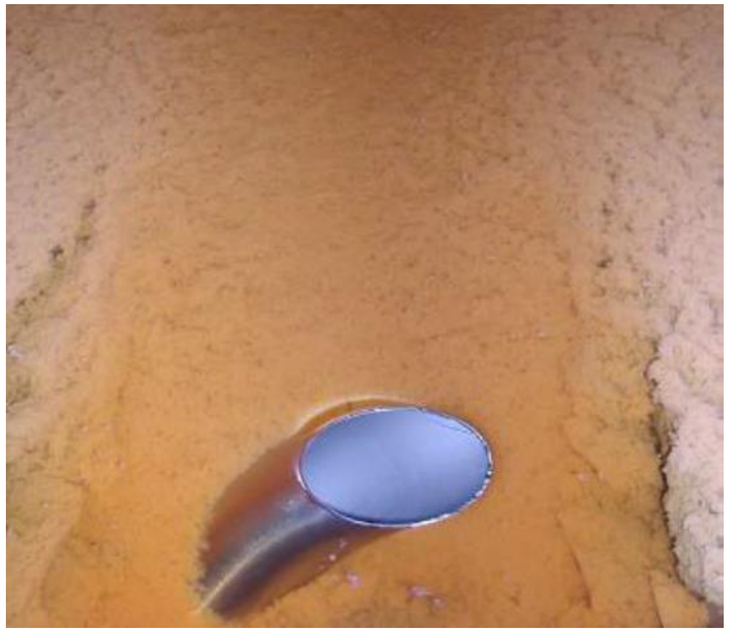
Total SO_2 content of the must: 30 mg/L

Sulfiting


5 g/hl
3,3 cl/hl BISULFITE
2 ml/hl INOZYME Terroir
5 cl/hl SULFITANIN
2 ml/hl INOZYME Terroir
SO2 t = <11 mg/L
SO2 t = 15 mg/L
6 g/hl
4 cl/hl BISULFITE
2 ml/hl INOZYME Terroir
6 cl/hl SULFITANIN
2 ml/hl INOZYME Terroir
SO2 t = <11 mg/L
SO2 t = 28 mg/L

Enzymes

Using enzymes at 1 g/HL allows you to obtain perfectly settled musts



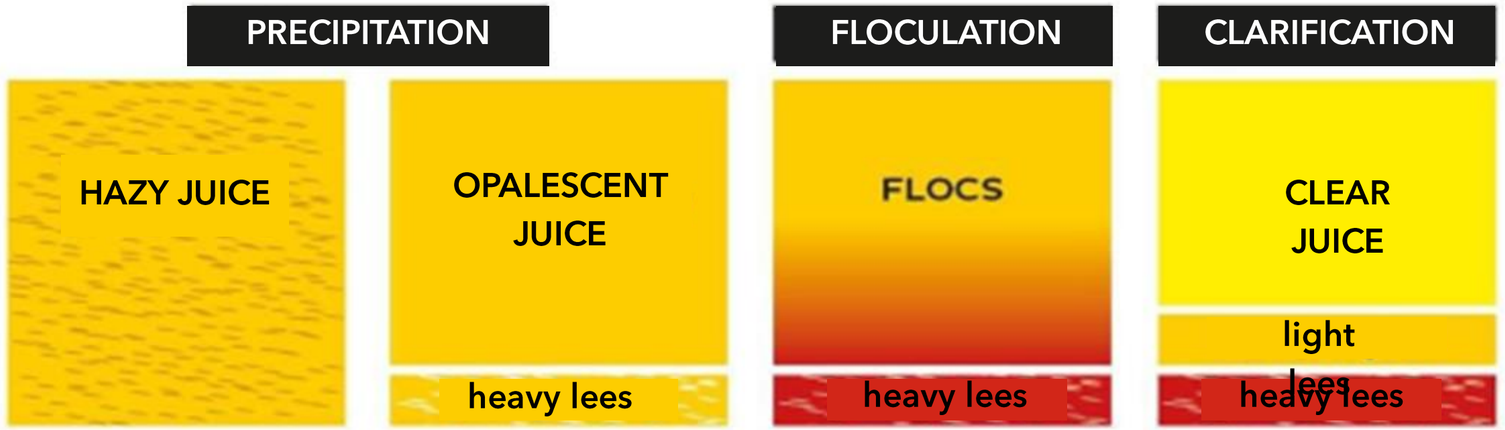
Enzymes benefits:

- Better compaction of the lees
- Savings on settling time (10-12 hours)
- Elimination of precursors of herbaceous tastes (giving vegetal and bitterness)
- Pectinases alone or in combination with glucanases

Practical use:

- The enzymes can be added to the belon halfway through (at the end of the first pressing cycle of the Cuvée).

The settling



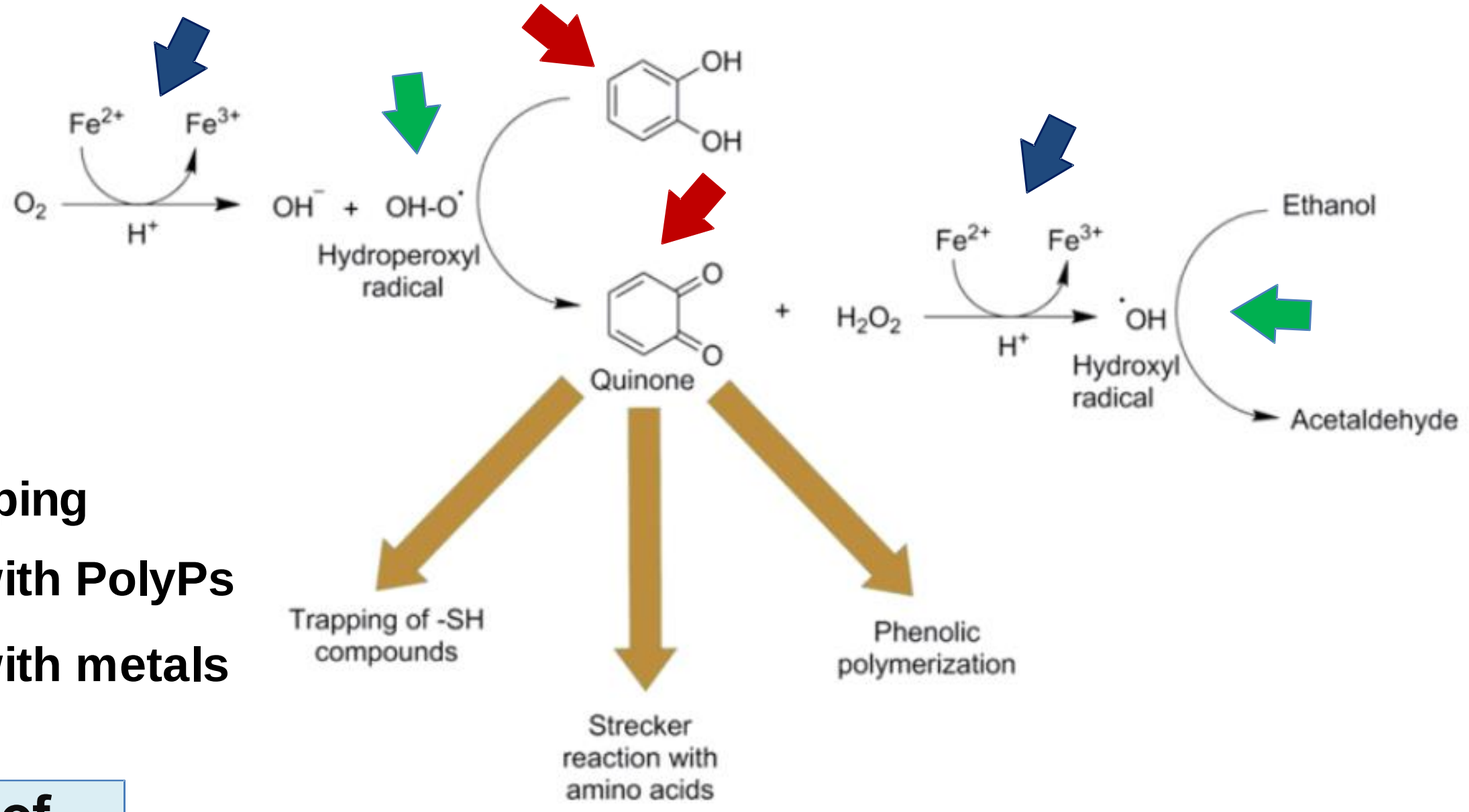
Without enzymes, flocculation is not systematic, and the juice may remain cloudy.

Products that can be used for settling to limit oxidative notes and bitterness

- **PVPP** – Eliminates vegetal/bitter notes, in high doses thins wines.
- **Qi No[Ox] TM** – Pea Protein, Chitosan, bentonite: Elimination of polyphenols & oxidation precursors, colloidal stabilization.
- **INOFINE V TM** – Pea proteins: strong power of interaction with polyphenols, sediments quickly.
- **COLORPROTECT V TM** – Bentonite, PVPP, pea protein: The 3 in 1, without casein, anti-oxidant role, excellent sedimentation kinetics, improves organoleptic characteristics.
- **Qi FINE TM** – **Pea Protein, Chitosan**: Elimination of unstable polyphenols, reduction of astringency & bitterness, reduction of oxidation precursors.
- **FYNEO TM** - **Yeast protein extract**, top-grade clarifier facilitating rapid sedimentation. Refines wines by eliminating harsh and bitter back palate notes, while preserving aromas.

Fining and Clarification

- How to fight oxidation ?



Radical trapping

Interaction with PolyPs

Interaction with metals

In wine, chitosan is a scavenger of radicals and metals and is capable of interacting with polyphenols

CONTENT

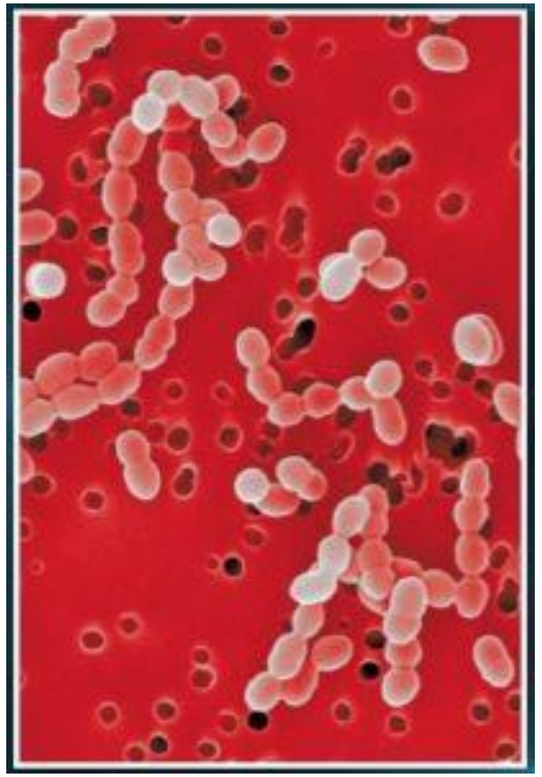
3/ BASE WINE ELABORATION: THE ESSENTIAL ROLE OF FERMENTATION AND BLENDING

Alcoholic fermentation

- Choose a **selected yeast** and a **protectant** for these fermentation conditions
- A temperature between 15 and 20 degrees
- A pH close to 3.0
- An average nitrogen requirement
- Add **organic nutrition** with **thiamine**

Malolactic fermentation

- **Why?** In order to avoid MLF in the bottle, microbiological security.
- **Today:** In Champagne, more than 90% of the producers achieve malolactic fermentation. But more and more producers are trying to block totally or partially the MLF. New trend in the face of global warming to maintain crispness.
- **Levers:** Cold temperatures, sulfiting, must fining, tirage date, and filtration.



CONTENT

4/ SECURING THE SECOND FERMENTATION AND REMUAGE

Ideal conditions for secondary fermentation

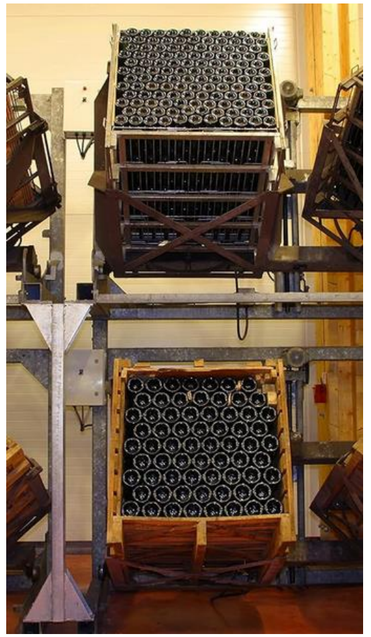
- **Alcohol** < 11,40%
- **Free SO2** < 12 mg/L
- **Active SO2** < 0,45 mg/L
- **pH** > 2,90
- **Temperature** between 13 and 16°C
- **CO2** < 400 mg/L
- **Yeast** between 1,5 and 2 million of cells /mL

Remuage

- **CLARIFIANT XL TM**
  Optimised riddling aid, bentonite and silicate, excellent compaction of the sediment.
- **CLARIFIANT S TM**
  Bentonite only, according to BIO standards
- **CLARIFIANT NAT TM**
  Non-activated bentonite, according to NOP standards

Usable in Bio

Usable in Bio and NOP

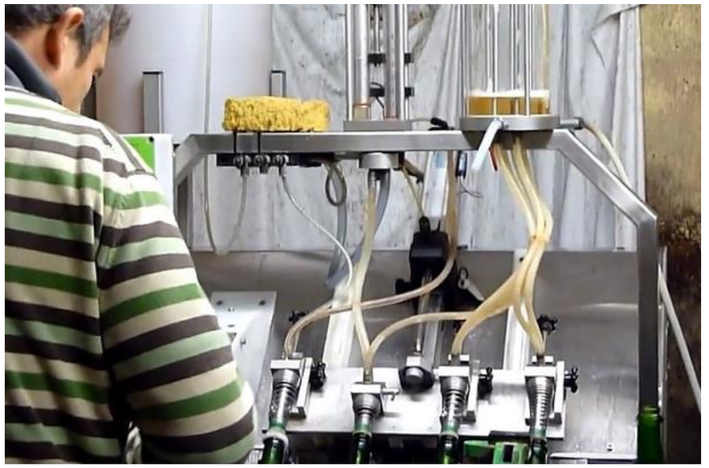


CONTENT

4/ DISGORGEMENT: THE FINAL TOUCH OF THE CHAMPAGNE WINEMAKER

Expedition liquor

- **Wine protection:** SO2
- **Final touch :** Tanins, Mannoproteins, Arabic gums, Ascorbic acid



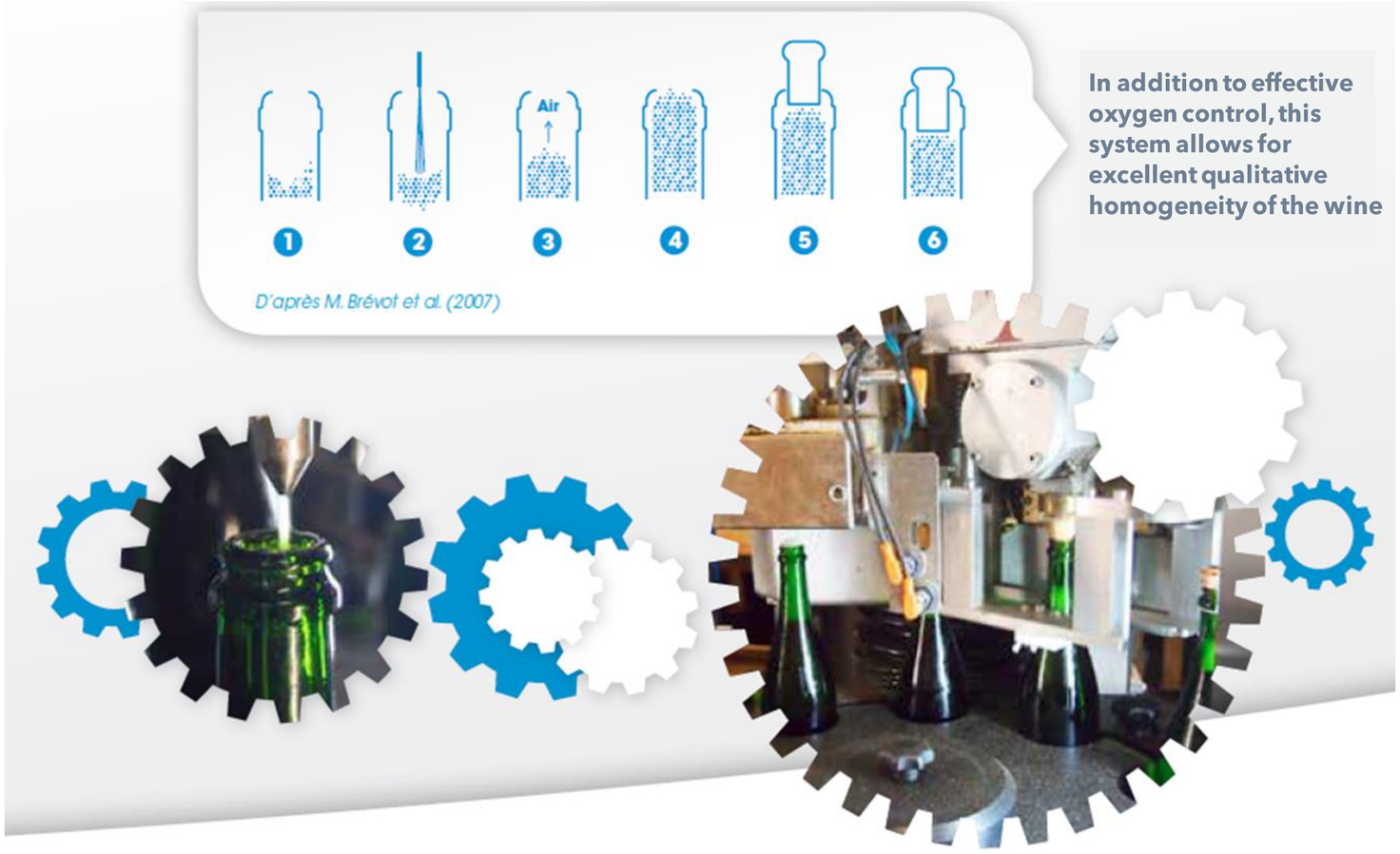
PRIVILÈGE BLEU

.ESSENTIAL

ultiMA

SULFITAMINE C™

Jetting



LOW SO_2 SOLUTIONS

THANKS FOR YOUR ATTENTION

LET'S TASTE!

Base wines

Produit	Vin blanc	Vin blanc	Vin blanc	
Type	Vin Traité	Vin Traité	Vin Traité	
Ref vin	PINOT NOIR	CHARDONNAY	MEUNIER	
Divers	--	--	--	
Volume	--	--	--	
N° Echantillon	2401160041	2401160042	2401160043	
Reçu le	15/01/2024	15/01/2024	15/01/2024	
Titre alcoometrique vol. à 20°C	11.25	11.45	11.15	% Vol
Acidité totale	4.8	4.1	4.5	g H_2SO_4/L
pH	3.15	3.30	3.27	
Acidité volatile	0.24	0.25	0.22	g H_2SO_4/L
Sucres réducteurs	<1.0	<1.0	<1.0	g/L
Dioxyde de soufre total	54	70	53	mg/L
Acide malique	<0.4	<0.4	<0.4	g/L
Dioxyde de soufre libre	19	20	18	mg/L

Expedition liquors

- **ASCORBIC ACID**
- **ARABIC GUM**
- **MANNOPROTEINS**
- **TEMOIN**

Produit	Effervescent blanc	
Type	Dosé	
Ref vin	B	
Divers	PDC	
Volume	--	
N° Echantillon	2401170133	
Reçu le	17/01/2024	
Titre alcoometrique vol. à 20°C	12.40	% Vol
Acidité totale	5.6	g H_2SO_4/L
pH	2.99	
Acidité volatile	0.20	g H_2SO_4/L
Dioxyde de soufre total	63	mg/L
Acide malique	5.3	g/L
Dioxyde de soufre libre	ND	mg/L
Sucres totaux	12.3	g/L

Expedition liquors

- **A : TEMOIN**
- Dosage : 10 mL of MCR : 11,5 g/L
- 10 mL / 100 bottles of POTASSIUM BISULFITE 150 g/L (+ 20 mg/L)

- **B : ARABIC GUM**
- Dosage : 10 mL of MCR : 11,5 g/L
- 10 mL / 100 bottles of POTASSIUM BISULFITE 150 g/L (+ 20 mg/L)
- 40 mL / 100 bottles of FLASH GUM R MF

- **C : MANOPROTEIN**
- Dosage : 10 mL of MCR : 11,5 g/L
- 10 mL / 100 bottles of POTASSIUM BISULFITE 150 g/L (+ 20 mg/L)
- 40 mL / 100 bottles of ULTIMA READY LIFE

- **D : ACIDE ASCORBIQUE**
- Dosage : 10 mL of MCR : 11,5 g/L
- 30 mL / 100 bottles of SULFITAMINE