13 juillet 2020

REGULATION OF ORGANIC WINEMAKING AND DESIRE TO REDUCE INPUTS IN OENOLOGY

VIGNERONS BIO
NOUVELLE AQUITAINE

Vignerons Bio Nouvelle Aquitaine

Vignerons Bio Nouvelle Aquitaine

VBNA

200 organic winegrowers

Follow-up of more than 100 growers in winemaking

Animation of the network of organic wine advisors from the New Aquitaine region: 65 public and private advisors

VIGNERONS BIO
NOUVELLE AQUITAINE

Vignerons Bio Nouvelle Aquitaine : Our missions

Regional union representative of the Organic Wines producer created in 1995
Today, more than 200 organic winegrowers are members
Accompanying the harvest until it is put on the market

REPRÉSENTATION & DÉFENSE

bio winemakers' interests in regional, national and European viticulture and organic

PROMOTION

Promote and develop the collective image and awareness of organic wines and spirits among professionals and individuals

RECHERCHE & DÉVELOPPEMENT

Initiate and collaborate on research and experimentation programs aimed at improving the quality of Organic wines

ŒNOLOGIE

ECONOMIE

Contribute to the economic and technical development of organic wine production, by accompanying organic winegrowers individually and collectively

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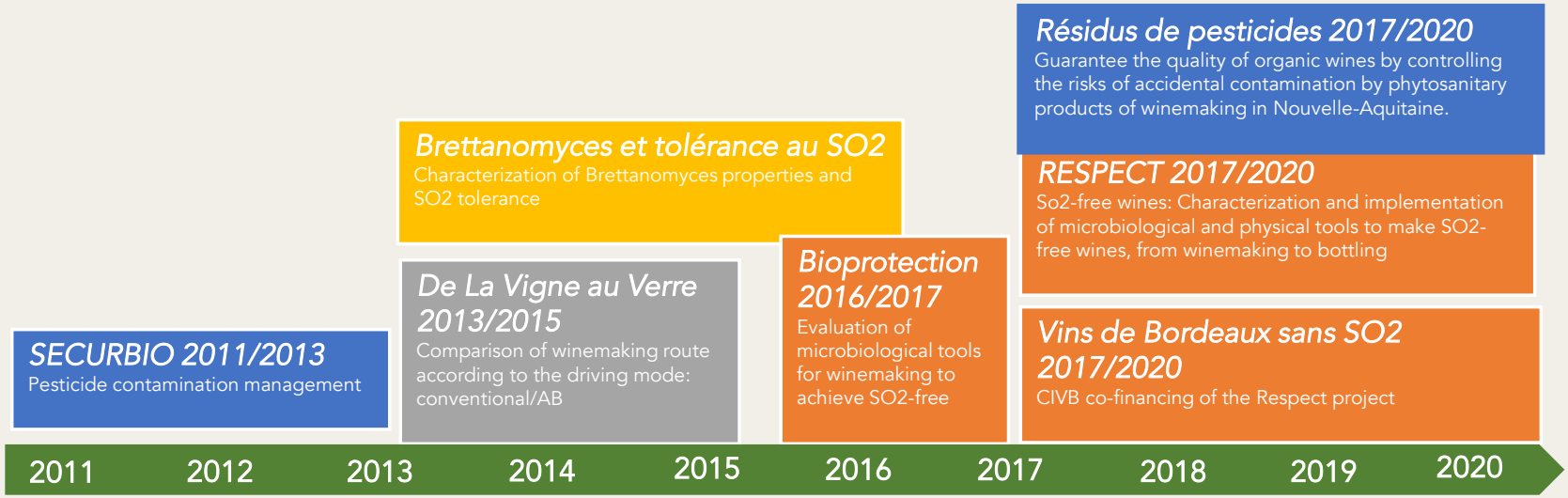
Research and experimentation projects



Les domaines de recherche :

Résidus pesticide | Microbiologie | Modes de production | Vinification sans SO2 | Nouveaux intrants

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Programme pour accompagner à la réalisation de vins sans SO2

RESPECT 2017/2020
So2-free wines: Characterization and implementation of microbiological and physical tools to make SO2-free wines, from winemaking to bottling

RESAQ Viti Bio 2021
Participatory experimentation on copper reduction and evaluation of new phytosanitary inputs

MERGO 2020/2023
Erasmus +
Learning remote tasting and creating MOOCs

Vins Sans 2021/2023
Suite de RESPECT
So2-free wines: Livestock and gas management
Impact on the structure and aromatics of wines
Sweet Wines

Vins de Bordeaux sans SO2 2017/2020
CIVB co-financing of the Respect project

Diffusion 2020/2021
Vins sans SO2/Colles/PDC Bacteria/Pesticides/Copper/Bio control
Regional Funding FEADER 1.2

Projet Chitosan 2021/2023
Suite de RESPECT
Management of brettanomyces
Management of malolactic fermentation in so2-free white wine

2020 2021 2022 2023

OenoBio
Erasmus +
Master europeen en viticulture œnologie Bio

Vinification des cépages résistants 2021/2023
Tools for mastering and evaluating the vinification of resistant grape varieties

Pesticides 2021/2023
Continuation of the Qualivin Bio program on pesticide contamination of organic wines and study of the specific case of phosphonic acid

COPPEREPLACE 2020/2023
Development and implementation of new ones
technologies, products and strategies to reduce
the application of copper in vineyards and to sanitize the
contaminated soils in the SUDOE region

Les domaines de recherche :

Autres | Vinification | Diffusions

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What is organic wine farming?

Brief history of Organic Farming

The organic farming movement developed in response to the advent of agrochemistry in the middle of the twentieth century, in the face of the development of pesticides and mineral fertilizers from synthetic chemistry.

Années 1920 : Birth of new schools of thought in Europe on the part of agronomists, doctors, farmers and consumers based on ethical and ecological principles with initiation of an alternative mode of agricultural production in criticism of the disappearance of the traditional peasantry

Années 1970 : Rise of the development of AB with the emergence of new sociological currents: resistance to the consumer society, awareness of the limits of the planet's resources with oil crisis...

1985 : Official recognition in France of Organic Farming allowing the approval with logo of AB products according to a national specification

1991 : Birth of a harmonized European regulation on AB, first crop production and then in 2000 for animal production

2012 : Birth of the European organic winemaking regulations, allowing to display "organic wine" and more: "wine from organically farmed grapes"

2022 : New European Regulation on Organic Farming

Les grands principes de l'AB

- ✓ allow soils to maintain their natural fertility
- ✓ respect the environment
- ✓ provide quality products
- ✓ favouring the autonomy of agricultural holdings
- ✓ establish direct relationships with consumers
- ✓ promoting employment in the agricultural sector

History of Organic Wine Regulation

*2009 : **ORWINE** program launched by the European Commission to define specifications on organic winemaking regulations. Studies include scientific research programs and manufacturers/distributors/users/consumers surveys.*
*2012: Birth of the **European Regulation on organic winemaking**, to display the "organic wine" and not: "wine of grapes from organic farming" Regulation (EU) 203/2012*

2014/2015: Opening of a request for evaluation of the organic winemaking regulations at the request of the Member States and the commission (evaluation of new oenological practices that were not yet authorized in 2010 and assessment of the authorized practices including techniques with a re-evaluation deadline, which led to the EGTOP report mentioned below)

2015 : **EGTOP report "Final report on wine" on 17November 2015** with a number of recommendations

2018 : New Organic Winemaking Regulation Implementing Regulation (EU) 2018/1584 amends Regulation (EU) 203/2012.

2018 : REGULATION EU 2018/848, which will repeal EC 834/2007 on 31/12/2020
The prohibited techniques are incorporated into the basic regulation, which will prevent any future changes.
Authorization of heating at 75°C

2018 à 2021 : Work on the construction of the implementing regulation
Oenological inputs will be authorized by implementing acts. New oenological processes may be introduced by delegated act.
Work on the alignment of the organic regulation with the new wine regulation (EU) 934/2019 carried out by the European Commission

***Jan 2022 :** Application of the new organic farming regulation EU 2018/848*

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A major evolution in 2018

Names of products or substances	Type of treatment targeted	Specific conditions and restrictions within the limits and conditions laid down in Regulation (EC) No 1234/2007 and Regulation (EC) No 606/2009
Yeast autolysates	Yeast nutrition	Only for fresh grapes, grape must, grape must in fermentation, partially fermented grape must from passerillé grapes, concentrated grape must, new wine still in fermentation
Vegetable proteins from potatoes (2) **Chitosan derived from Aspergillus niger** **Levurian protein extracts (2) (EPL)**	Clarification	For the treatment of wines, the limit of use of chitosan is a maximum of 100 g/hl. For the treatment of musts and white wines and rosé wines, the limit for the use of EPL is 30 g/hl and for the treatment of red wines, 60 g/hl.
Yeast mannoproteins	Tartaric stabilization	For partially fermented must used for direct human consumption in the unalted state and the products defined in points 1, 3, 4, 5, 6, 7, 8, 9, 15 and 16 of Annex IV to Regulation (EC) No 479/2008
Chitosan derived from Aspergillus niger	Wine stabilization	a) Reduction of the content of heavy metals, in particular iron, lead, cadmium and copper b) Prévention de la casse ferrique, la casse cuivrique c) Reduction of potential contaminants, in particular ochratoxin A d) Reduction of populations of undesirable microorganisms, including Brettanomyces, by chitosan-only treatment <u>Prescriptions:</u> ♦ The doses to be used shall be determined after prior testing. The maximum dose of use must be less than or equal to: - 100 g/hl for applications (a) and (b) - 500 g/hl for application (c) - 10 g/hl for application (d) - ♦ Sediments are removed by physical processes.
Inactivated yeasts (LSI)	Yeast nutrition/breeding	

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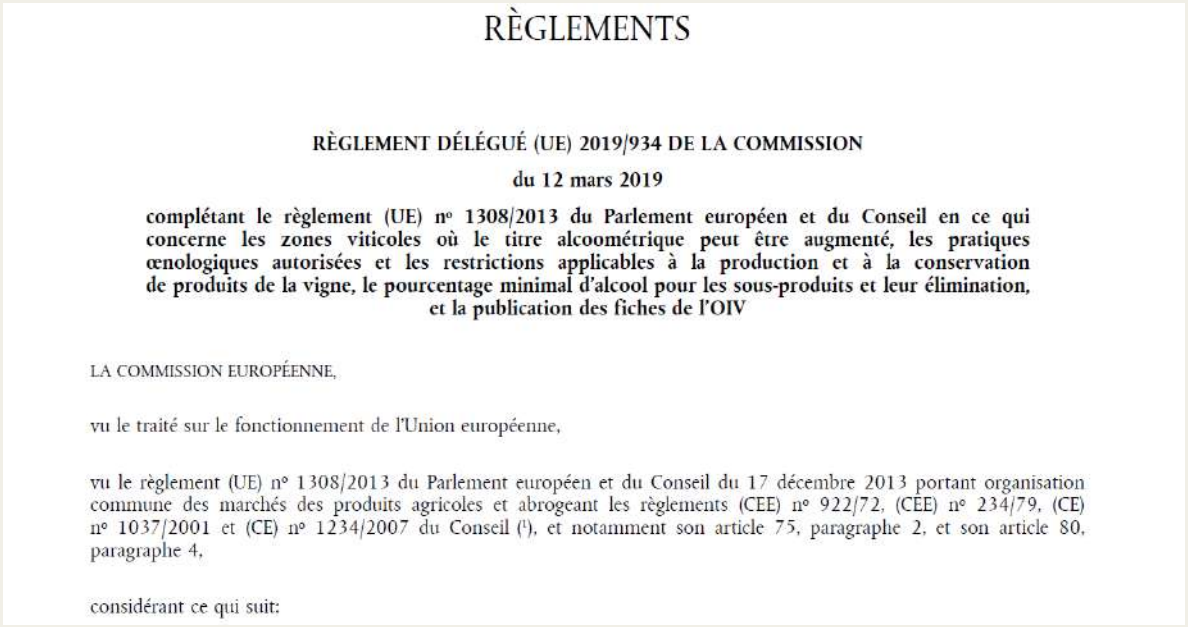
New wine regulation



RÈGLEMENTS

RÈGLEMENT DÉLÉGUÉ (UE) 2019/934 DE LA COMMISSION

du 12 mars 2019

complétant le règlement (UE) nº 1308/2013 du Parlement européen et du Conseil en ce qui concerne les zones viticoles où le titre alcoométrique peut être augmenté, les pratiques œnologiques autorisées et les restrictions applicables à la production et à la conservation de produits de la vigne, le pourcentage minimal d'alcool pour les sous-produits et leur élimination, et la publication des fiches de l'OIV

LA COMMISSION EUROPÉENNE,

vu le traité sur le fonctionnement de l'Union européenne,

vu le règlement (UE) nº 1308/2013 du Parlement européen et du Conseil du 17 décembre 2013 portant organisation commune des marchés des produits agricoles et abrogeant les règlements (CEE) nº 922/72, (CEE) nº 234/79, (CE) nº 1037/2001 et (CE) nº 1234/2007 du Conseil (1), et notamment son article 75, paragraphe 2, et son article 80, paragraphe 4,

considérant ce qui suit:

New Regulation 934/2019 and 935/2019 replacing 606/2009

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Key point of Organics wine regulation

A number of wine inputs must be organic in origin, if available:

Wine Regulation 934/2019					Organic wine regulation 2164/2019
	Substance	Detail	additif	auxiliary	
4	Activators of alcoholic and malolactic fermentation				
4.6	Yeast autolysates			x	Authorized Organic if available
4.7	Yeast bark			x	Authorized Organic if available
4.8	Inactivated yeasts			x	Authorized Organic if available
5	Clarifying agents				
5.1	Food gelatin			x	Authorized Organic if available
5.2	Wheat protein			x	Authorized Organic if available
5.3	Protein from peas			x	Authorized Organic if available
5.4	Protein from potatoes			x	Authorized Organic if available
5.5	glue			x	Authorized Organic if available
5.12	Tanins			x	Authorized Organic if available
5.15	Levurian protein extracts			x	Authorized Organic if available
6	Stabilizing agents				
6.4	Tanins				Authorized Organic if available
6.8	gum arabic		x		Authorized Organic if available
9	Fermentation agents				
9.1	Yeast	not gmo-derived		x	Authorized Organic if available
9.2	Lactic acid bacteria	not gmo-derived		x	Authorized Organic if available

A list of organic wine imput is available in France. Produced each year by France Vin Bio in partnership with UFLIO and OENOPPIA validated and disseminated by INAO

VIGNERONS BIO NOUVELLE AQUITAINE

Non-exhaustive list of prohibited organic inputs

	Wine Regulation 934/2019				Organic Regulation 2164/2019
	Substance	Detail	additive	auxiliary	
1	regulator				
1.2	Malic acid (D, L-; L-)	Acide L- malique	X		Forbidden
1.7	Calcium tartrate			X	Forbidden
1.9	Potassium carbonate			X	Forbidden
2	Preservatives and antioxidants				
2.4	Potassium sorbate		X		Forbidden
2.5	Lysozyme		X	X	Forbidden
2.7	Dimethyl dicarbonate (DMDC)		X		Forbidden
3	Sequesters				
3.2	Selective vegetable fibres			X	Forbidden
4	of alcoholic and malolactic fermentation				
4.1	Microcrystalline cellulose			x	Forbidden
4.3	ammonium sulphate			x	Forbidden
4.4	Ammonium bisulphite			x	Forbidden
4.9	Inactivated yeasts with guaranteed glutathione levels			x	Forbidden
5	agents				
5.11	Kaolin			x	Forbidden
5.14	Chitin-glucan derived from Aspergillus niger			x	Forbidden
5.16	Polyvinylpolypyrrolidone			x	Forbidden
5.17	alginate			x	Forbidden
6	agents				
6.2	tartrate			x	Forbidden
6.5	ferrocyanide			x	Forbidden
6.6	phytate			x	Forbidden
6.9	D, L- tartaric acid or its neutral potassium salt			x	Forbidden
6.11	Carboxymethylcellulose		x		Forbidden
6.12	Polyvinylimidazole-polyvinylpyrrolidone copolymers (PVI/PVP)			x	Forbidden
6.13	Potassium polyaspartate		x		Forbidden
7	Enzymes				
7.1	Urease			x	Forbidden
7.7	Betaglucanase			x	Forbidden
7.8	Glycosidase			x	Forbidden
10	Correction of defects				
10.1	Copper sulphate, pentahydrate			x	Forbidden
10.4	Chitin-glucan derived from Aspergillus niger			x	Forbidden
11	practices				
11.3	Caramel		x		Forbidden
11.4	Allyl isothiocyanate			x	Forbidden
	Technic				
5	Elimination of sulphur dioxide by physical processes				Forbidden
9	Pure paraffin discs impregnated with allyl isothiocyanate				Forbidden
10	Electrodialysis treatment				Forbidden
12	Correction of the alcohol content of wines	dealcoholization			Forbidden
13	Cation exchangers for tartaric stabilization				Forbidden
14	Electromembran treatment				Forbidden
15	Cation exchangers for acidification				Forbidden
16	Membrane coupling				Forbidden
17	Membrane contactors				Forbidden
18	Membrane technology associated with activated carbon				Forbidden
19	Filter plates containing Y-faujasite zeolites				Forbidden

List of inputs and techniques

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Le SO2

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The rule laid down is a reduction of 50 mg/L in the total SO2 content for dry wines (<2 g/L of residual sugars) and 30 mg/L for other wines compared to the limits of the COM

SO2 mg/l	Rgt Européen OCM Viti-Vini N° 479/2008	(1) Rgt Européen BIO (CE) 889/2008 (2019)
	Total	Total
Dry red wines (< 2g/l sugar)	150	100
Dry red wines (≥ 2g/l and < 5g/l sugar)		120
Red wines (≥ 5g/l sugar) and semi-dry	200	170
Dry white wines/rosés (< 2g/l sugar)	200	150
White wines/dry rosés (≥ 2g/l and < 5g/l sugar)		170
wines (≥ 5g/l sugar) and semi-dry	250	220
wines for certain PDOs (so-called "sweet")	400	370
wines (>12 and < 45g/l sugar)	300	270
wines (≥ 45g/l sugar)	200	170
wine (TAV > 15%)	200 (sucre >= 5g/l)	170 (sucre >= 5g/l)
Sparkling	235	205
Quality effervescents	185	155

Regulatory news

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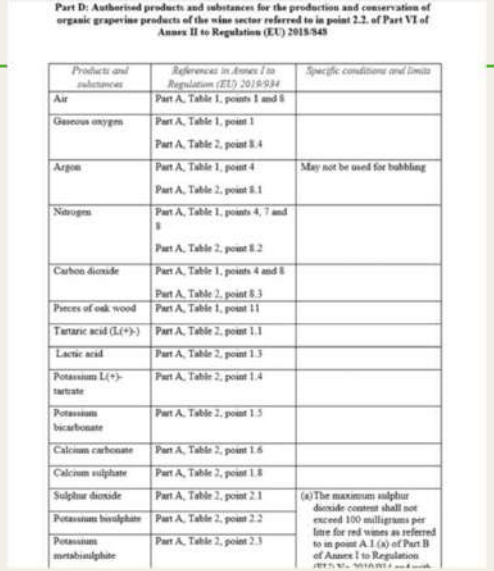
The organic winemaking regulations are built on the basis of the general wine regulations. However, the general wine regulation has evolved considerably during its last revision.
The work set in motion by the European Commission is to achieve the correspondence between this new wine regulation and the wine regulation



Part D: Authorised products and substances for the production and conservation of organic grapevine products of the wine sector referred to in point 2.2. of Part VI of Annex II to Regulation (EU) 2018/848

Products and substances	*References in Annex I to Regulation (EU) 2019/934*	*Specific conditions and limits*
Air	Part A, Table 1, points 1 and 8	
Gaseous oxygen	Part A, Table 1, point 1 Part A, Table 2, point 8.4	
Argon	Part A, Table 1, point 4 Part A, Table 2, point 8.1	May not be used for bubbling
Nitrogen	Part A, Table 1, points 4, 7 and 8 Part A, Table 2, point 8.2	
Carbon dioxide	Part A, Table 1, points 4 and 8 Part A, Table 2, point 8.3	
Pieces of oak wood	Part A, Table 1, point 11	
Tartaric acid (L(+)-)	Part A, Table 2, point 1.1	
Lactic acid	Part A, Table 2, point 1.3	
Potassium L(+)-tartrate	Part A, Table 2, point 1.4	
Potassium bicarbonate	Part A, Table 2, point 1.5	
Calcium carbonate	Part A, Table 2, point 1.6	
Calcium sulphate	Part A, Table 2, point 1.8	
Sulphur dioxide	Part A, Table 2, point 2.1	(a)The maximum sulphur dioxide content shall not exceed 100 milligrams per litre for red wines as referred to in point A.1 (a) of Part B of Annex I to Regulation
Potassium bisulphite	Part A, Table 2, point 2.2	
Potassium metabisulphite	Part A, Table 2, point 2.3	

Usable filtration soils (perlites, cellulose, diatom earths) no longer appear in the general wine regulations (934/2019), are still present in Regulation No. 2164/2019, but no longer appear in the draft annex to the future organic regulation.
Legal analysis: all oenological practices authorized under the general regulations are authorized under the organic regulation unless otherwise specified. (art 1.2 of Part VI of Annex II of 848/2018): therefore there is no questioning of these substances

Enzymes: the current organic regulation indicates that pectolytic enzymes are allowed in clarification only: the new wine regulation allows to specify the enzymes that it includes in this list: pectin lyases; pectin methylsterase; polygalacturonase; hemicellulase; cellulase.
A request to extend these same enzymes in maceration for juice extraction is under construction

Actualité réglementaire

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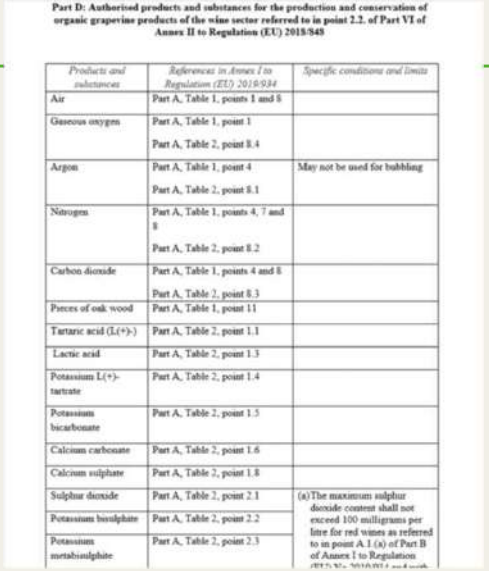


Part D: Authorised products and substances for the production and conservation of organic grapevine products of the wine sector referred to in point 2.2. of Part VI of Annex II to Regulation (EU) 2018/848

Products and substances	*References in Annex I to Regulation (EU) 2018/934*	*Specific conditions and limits*
Air	Part A, Table 1, points 1 and 8	
Gaseous oxygen	Part A, Table 1, point 1 Part A, Table 2, point 8.4	
Argon	Part A, Table 1, point 4 Part A, Table 2, point 8.1	May not be used for bubbling
Nitrogen	Part A, Table 1, points 4, 7 and 8 Part A, Table 2, point 8.2	
Carbon dioxide	Part A, Table 1, points 4 and 8 Part A, Table 2, point 8.3	
Pieces of oak wood	Part A, Table 1, point 11	
Tartaric acid (L(+)-)	Part A, Table 2, point 1.1	
Lactic acid	Part A, Table 2, point 1.3	
Potassium L(+)-tartrate	Part A, Table 2, point 1.4	
Potassium bicarbonate	Part A, Table 2, point 1.5	
Calcium carbonate	Part A, Table 2, point 1.6	
Calcium sulphate	Part A, Table 2, point 1.8	
Sulphur dioxide	Part A, Table 2, point 2.1	(a)The maximum sulphur dioxide content shall not exceed 100 milligrams per litre for red wines as referred to in point A.1 (a) of Part B of Annex I to Regulation
Potassium bisulphite	Part A, Table 2, point 2.2	
Potassium metabisulphite	Part A, Table 2, point 2.3	

▶ Fresh lees: They had been forgotten in the European Commission's alignment proposal
This point has been amended by the European Commission and the fresh lees have been incorporated into a new alignment proposal

▶ *Acidification: A request to add the use of malic acid in its natural form (L-malique) in organic has been made by France Vin Bio. It is currently being analyzed by the Organic WINE COMMISSION INAO for a possible French request*

▶ Cellulose microcristalline :
It was considered an adjuvant in oenology and did not appear as an input in the old wine regulations. However, this is an input that has been added to the new wine regulations.
In fact it is for the moment banned in Organic because not appraised by the EGTOP expert group of the European Commission and not validated by the commission. Microcrystalline cellulose is also due to be replaced shortly by food cellulose in the wine regulations.
A request for the addition of food cellulose to the organic regulation is being discussed at the INAO for the construction of a possible application to Europe
In the meantime, we must be vigilant about the composition of the products used. Microcrystalline cellulose is present in some compositions of inactivated dry yeasts and some chitosan formulations (especially in effervescent tablet form). The wines in which those products would have been used fall within the scope of the infringement 284 which provides for the downgrading of the lot at first finding.

▶ Electrodialysis: Reintroduction of the technique into organic regulations following the manufacturer's request
This technique is enshrined in the basic regulation which has already been voted on by the committee, the Council and Parliament. The committee recently recalled that there would be no possible amendment to the basic text.
France vin Bio has taken a stand against this request.

« Organic wine, Biodynamics, HVE, nature, vegan? »

Vin Bio, vin Biodynamique, vin méthode nature

MENTION	Vin Biologique	Vin Biodynamique	Vin méthode nature
REGLEMENTATION	European Regulations 834/2007, 889/2008, 203/2012	European Bio regulations + private specifications (Demeter, Biodyvin ...)	European Bio Regulations + private specifications (Wine nature method)
COORDINATEUR	European institutions In France: INAO	Private associations e.g. Demeter, Biodyvin (international union of winegrowers in biodynamic cultivation)	Private union Syndicat de défense du vin naturel (only one recognized to date)
ENGAGEMENTS	Organic Principles Compliance	Compliance with ab+ principles build a balanced plant/environment production system taking into account celestial and terrestrial forces	Compliance with ab principles + manual harvesting + no oenological input + no physical technique + no sulphites before and during fermentations
CONVERSION	3 years	3 years	Not
CERTIFICATION	Oui	Oui	Oui
ETIQUETAGE	Mention "Organic Wine" Mandatory European logo Optional French AB logo	Authorized information: "Vin Demeter" 'Biodynamic wine (certified by [...]) ' AB certified wine and biodynamic controlled »	Affixing one of the 2 logos "Wines method nature"

La Biodynamie

In the vineyard : same permissions as in AB with the addition of:
copper restricted to 3 kg/ha/year
all the crops of the domain must be in Biodynamics
biodynamic preparations (500 and 501 on the estate, 502 to 507 in compost)
Domain must act to maintain biodiversity

Au chai :

Vinification

Fermentation

Protection de la vendange	Dioxyde de soufre (SO2)	✓	✓
	Acide ascorbique	✓	✗
Enzymage, débourbage, extraction du jus	Enzyme pectolitique	✓	✗
	Enzyme d'extraction	✗	✗
Aération	Air / oxygène	✓	✓
Fermentation alcoolique	Levures exogènes	✓	✗*
Nutrition des levures	Ecorce de levures	✓	✓
	Thiamine	✓	✗
	Phosphate diammonique	✓	✗
	Bisulfite d'ammonium	✗	✗
Fermentation malolactique	Bactéries lactiques exogènes	✓	✗*

* une dérogation peut être accordée dans des cas bien précis, motivés et justifiés et après étude de la demande par la commission cahier des charges de Demeter France

Vin vegan

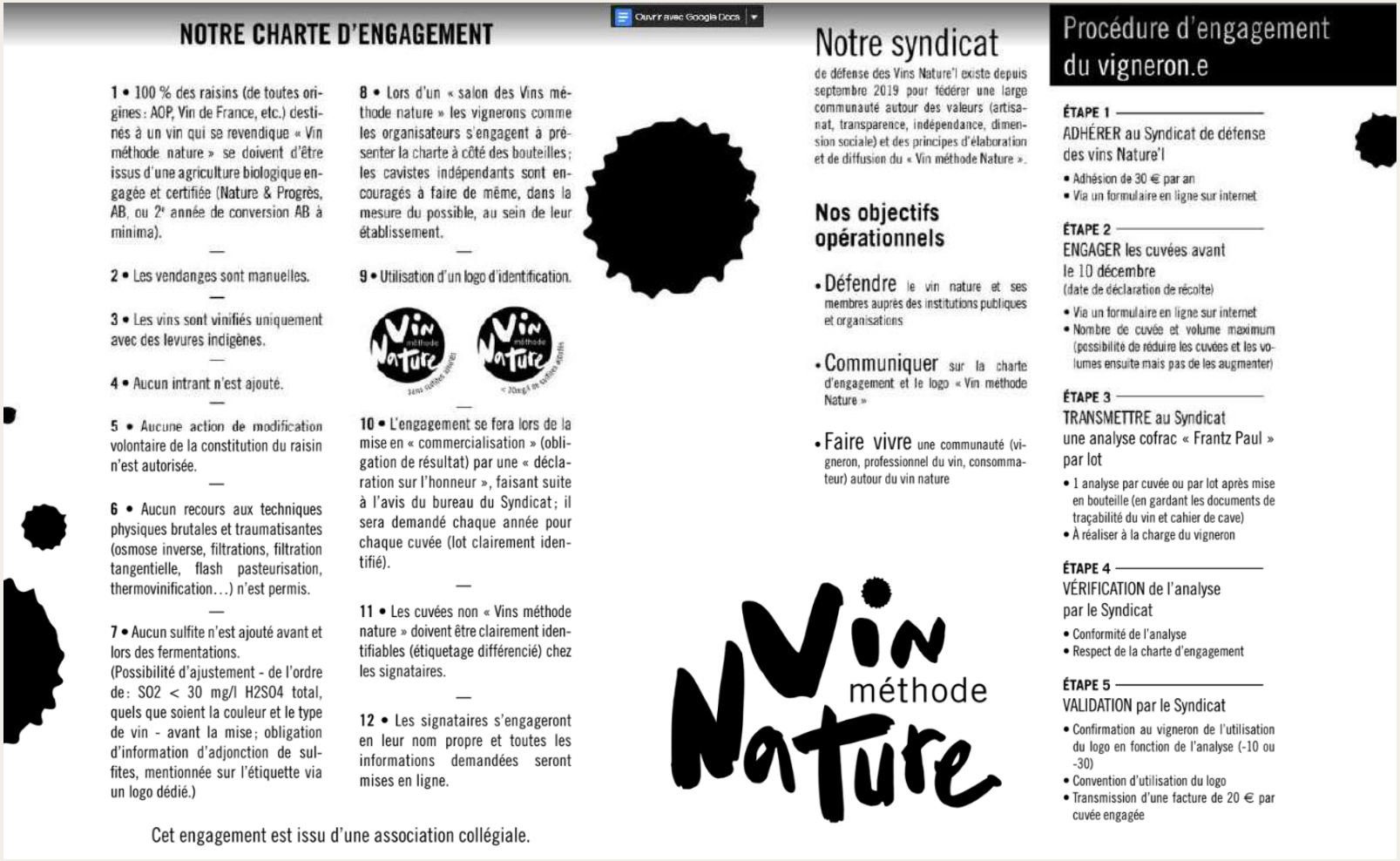
- ✓ means without the addition of animal inputs
- ✓

In the vineyard, no limitation.
(In biodynamics, the question arises of preparations 500 to 507)

In the cellar, certain oenological inputs not usable, in particular bonding product based on: Albumin/ovalbumin => egg/Fish glue/gelatin/Casein => skimmed milk/Oenological coal => varied origin including some animal

- ✓ Term and logo VEGAN royalty-free, no need to be certified to use them. => be able to prove its practices via its traceability in case of control or at the request of the consumer.
- ✓ Several brands offer product certification and the use of the logo associated with the brand.
- ✓ Certification becomes necessary when a certificate is requested from the winegrower by a professional buyer, in particular for export.
- ✓

Natural Wine



NOTRE CHARTE D'ENGAGEMENT

1 • 100 % des raisins (de toutes origines : AOP, Vin de France, etc.) destinés à un vin qui se revendique « Vin méthode nature » se doivent d'être issus d'une agriculture biologique engagée et certifiée (Nature & Progrès, AB, ou 2e année de conversion AB à minima).

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2 • Les vendanges sont manuelles.

—

3 • Les vins sont vinifiés uniquement avec des levures indigènes.

—

4 • Aucun intrant n'est ajouté.

—

5 • Aucune action de modification volontaire de la constitution du raisin n'est autorisée.

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6 • Aucun recours aux techniques physiques brutales et traumatisantes (osmose inverse, filtrations, filtration tangentielle, flash pasteurisation, thermovinification…) n'est permis.

—

7 • Aucun sulfite n'est ajouté avant et lors des fermentations.
(Possibilité d'ajustement - de l'ordre de : SO2 < 30 mg/l H2S04 total, quels que soient la couleur et le type de vin - avant la mise ; obligation d'information d'adjonction de sulfites, mentionnée sur l'étiquette via un logo dédié.)

8 • Lors d'un « salon des Vins méthode nature » les vignerons comme les organisateurs s'engagent à présenter la charte à côté des bouteilles ; les cavistes indépendants sont encouragés à faire de même, dans la mesure du possible, au sein de leur établissement.

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9 • Utilisation d'un logo d'identification.

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10 • L'engagement se fera lors de la mise en « commercialisation » (obligation de résultat) par une « déclaration sur l'honneur », faisant suite à l'avis du bureau du Syndicat ; il sera demandé chaque année pour chaque cuvée (lot clairement identifié).

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11 • Les cuvées non « Vins méthode nature » doivent être clairement identifiables (étiquetage différencié) chez les signataires.

—

12 • Les signataires s'engageront en leur nom propre et toutes les informations demandées seront mises en ligne.

Cet engagement est issu d'une association collégiale.

Notre syndicat

de défense des Vins Nature'l existe depuis septembre 2019 pour fédérer une large communauté autour des valeurs (artisanat, transparence, indépendance, dimension sociale) et des principes d'élaboration et de diffusion du « Vin méthode Nature ».

Nos objectifs opérationnels

- **Défendre** le vin nature et ses membres auprès des institutions publiques et organisations
- **Communiquer** sur la charte d'engagement et le logo « Vin méthode Nature »
- **Faire vivre** une communauté (vigneron, professionnel du vin, consommateur) autour du vin nature

Vin méthode Nature

Procédure d'engagement du vigneron.e

ÉTAPE 1
ADHÉRER au Syndicat de défense des vins Nature'l
- Adhésion de 30 € par an
- Via un formulaire en ligne sur internet

ÉTAPE 2
ENGAGER les cuvées avant le 10 décembre
(date de déclaration de récolte)
- Via un formulaire en ligne sur internet
- Nombre de cuvée et volume maximum (possibilité de réduire les cuvées et les volumes ensuite mais pas de les augmenter)

ÉTAPE 3
TRANSMETTRE au Syndicat une analyse cofrac « Frantz Paul » par lot
- 1 analyse par cuvée ou par lot après mise en bouteille (en gardant les documents de traçabilité du vin et cahier de cave)
- À réaliser à la charge du vigneron

ÉTAPE 4
VÉRIFICATION de l'analyse par le Syndicat
- Conformité de l'analyse
- Respect de la charte d'engagement

ÉTAPE 5
VALIDATION par le Syndicat
- Confirmation au vigneron de l'utilisation du logo en fonction de l'analyse (-10 ou -30)
- Convention d'utilisation du logo
- Transmission d'une facture de 20 € par cuvée engagée

VIGNERONS BIO
NOUVELLE AQUITAINE

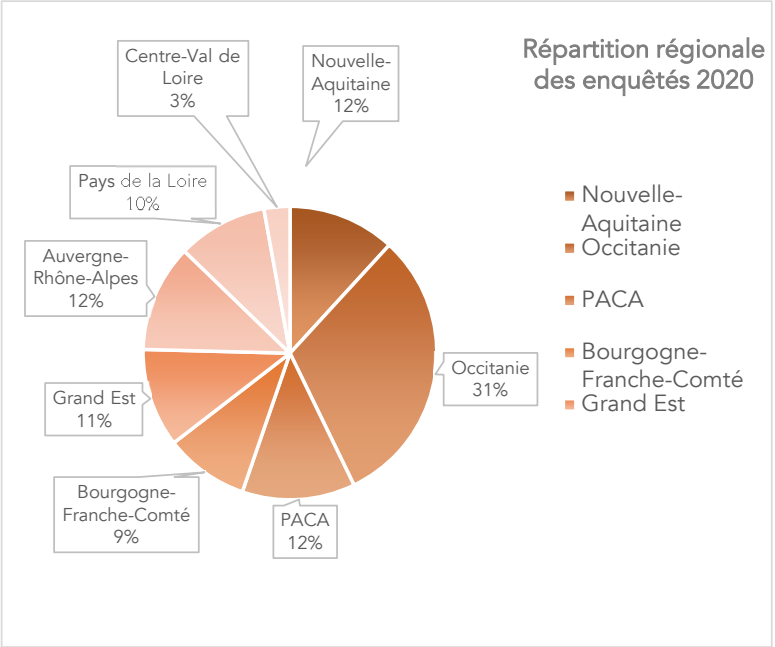
Imput and technics use on the estate

SURVEY ON THE OENOLOGICAL PRACTICES OF ORGANIC WINEGROWERS IN FRANCE MILLESIME 2020

itab
l'Institut de l'agriculture
et de l'alimentation biologiques

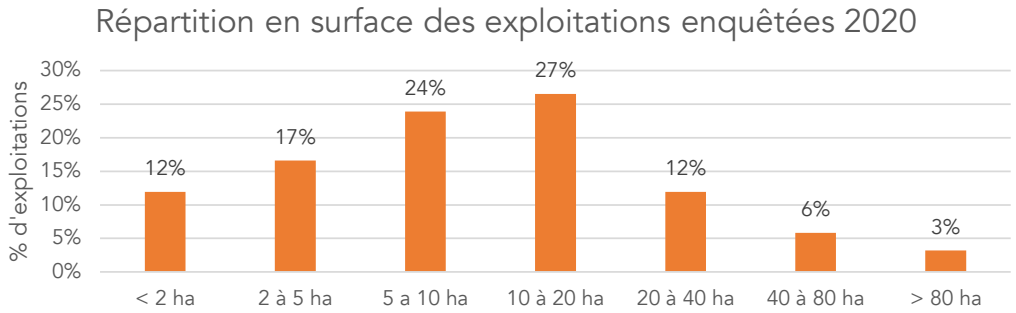
- The survey on oenological practices has been carried out since 2012.
- It makes it possible to take stock of the vintage that has just passed by highlighting the use of inputs and techniques by organic winegrowers in Oenology.
- In recent years we have also added a very short survey on the phytosanitary campaign.
- Its renewal every year makes it possible to follow the evolution of the practices of organic winegrowers in France
- It also constitutes a working basis to build the technical arguments that will be used to evolve the regulations for the benefit of organic winegrowers.

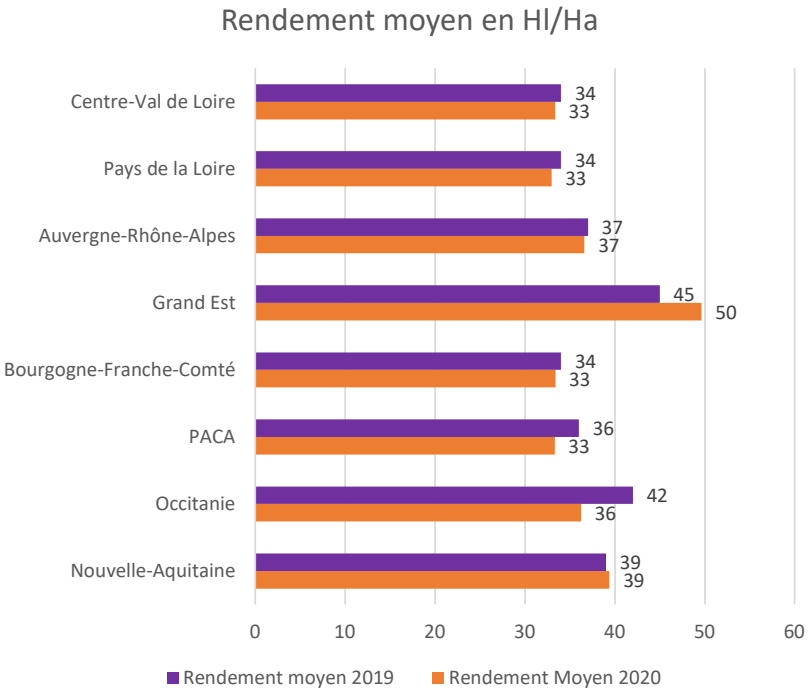
Description of the sample



The average size of the properties surveyed is 28.83 ha

343 organic winegrowers, spread over the entire territory

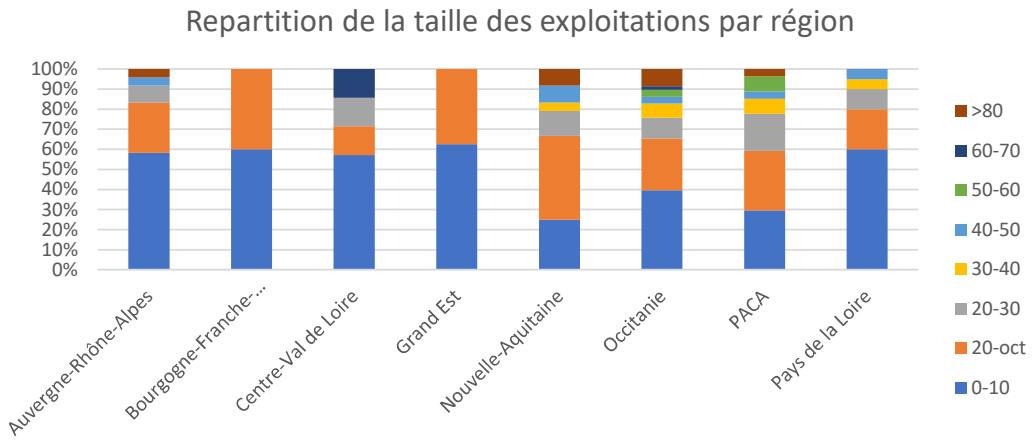


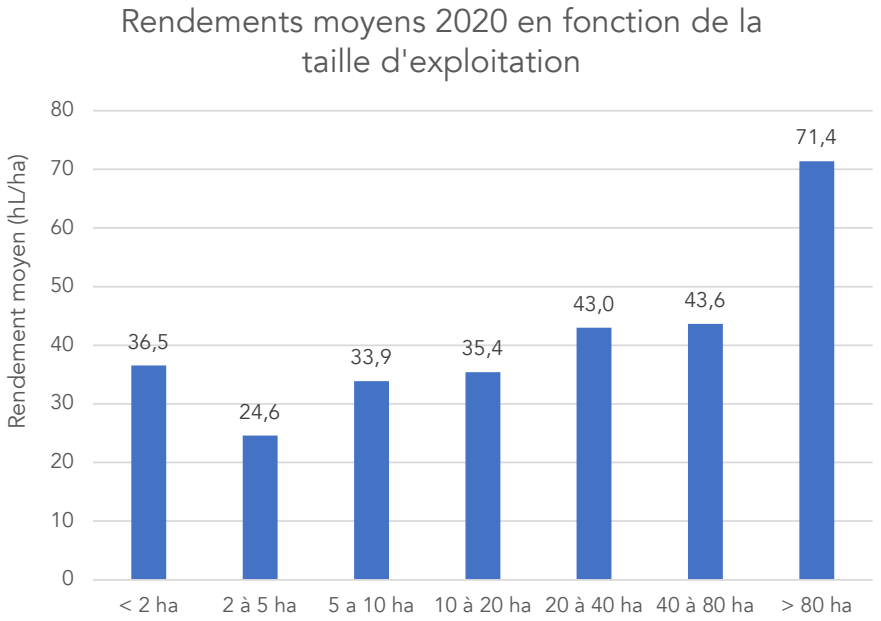


Slightly lower yields in almost all regions, in line with climatic conditions and field observations.

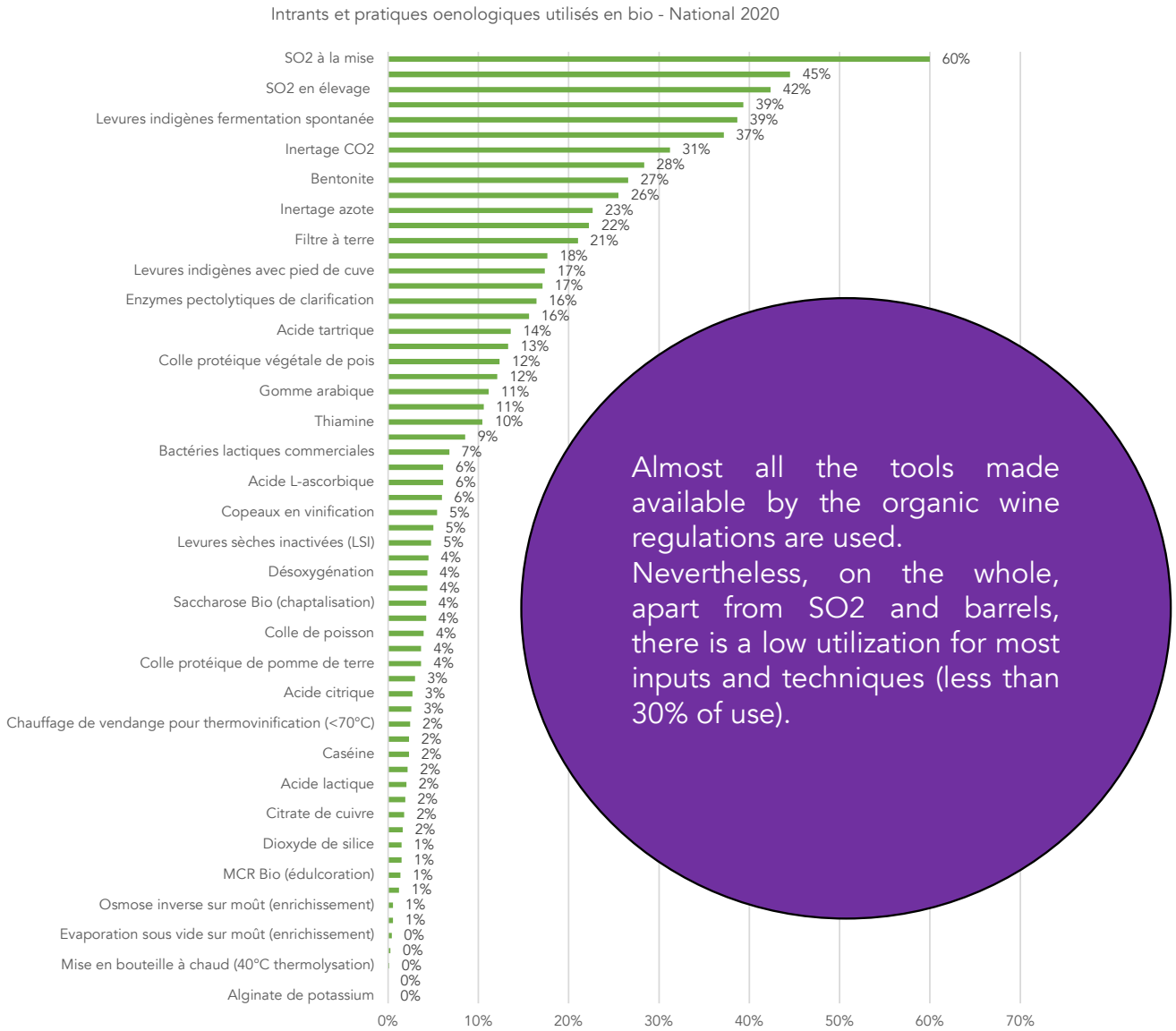
This situation had also been confirmed during the campaign review carried out in the Organic INAO wine commission by all the professionals around the table.

The size of the farms which is dependent on the region of production, the type of wine achieved impact on the yields produced. Indeed the yield is more important on the properties with large surfaces





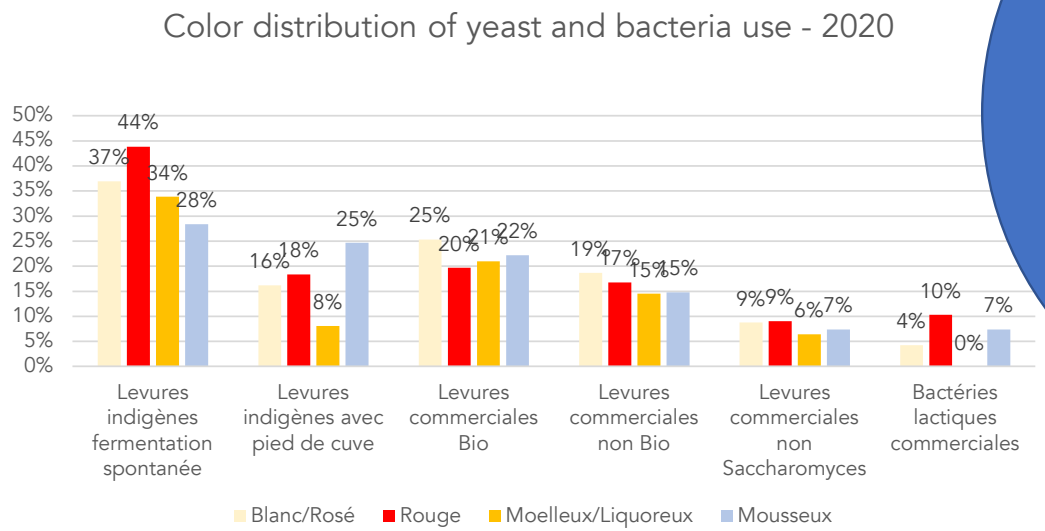
Input/Technical Uses in 2020



Almost all the tools made available by the organic wine regulations are used.
Nevertheless, on the whole, apart from SO2 and barrels, there is a low utilization for most inputs and techniques (less than 30% of use).

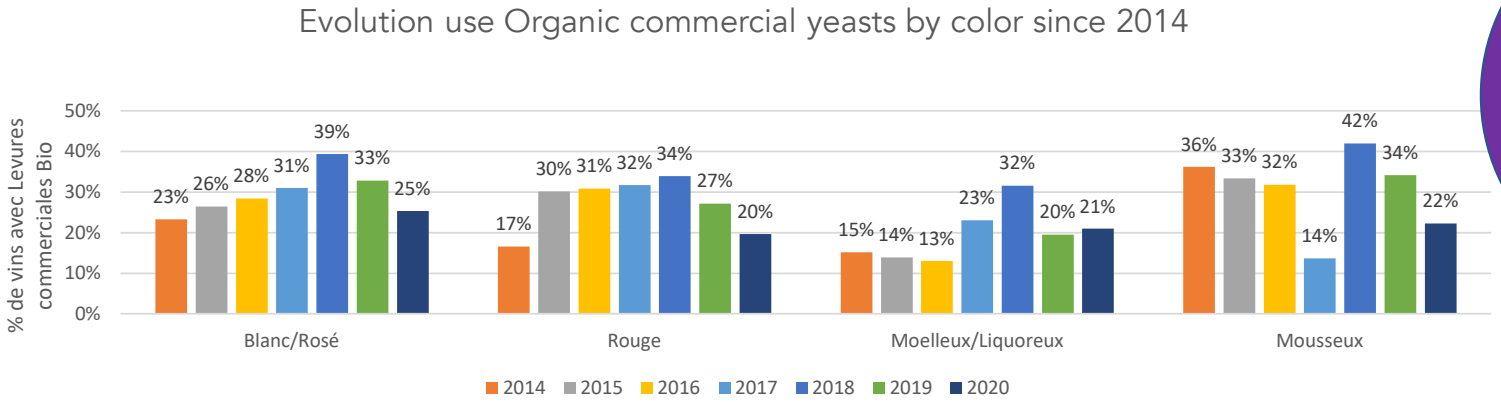
Focus par types d'intrants en 2020

Yeasts and bacteria



The use of native fermentation remains lower in white/rosé than in red.

The impact of yeast being more important on the aromatic profile and the very important use of a cold phase to settling the mouts in white encourage winegrowers to resort to commercial yeasts to ensure good fermentation and good quality.



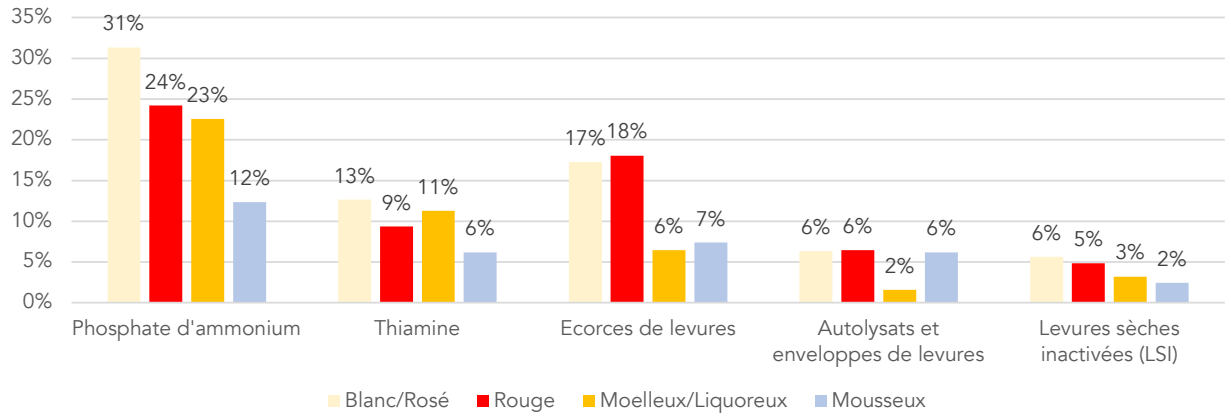
If we look a little more ready the specific use of organic yeasts we find that there is little evolution of use.

Focus by input types in 2020

Nutrition and clarification

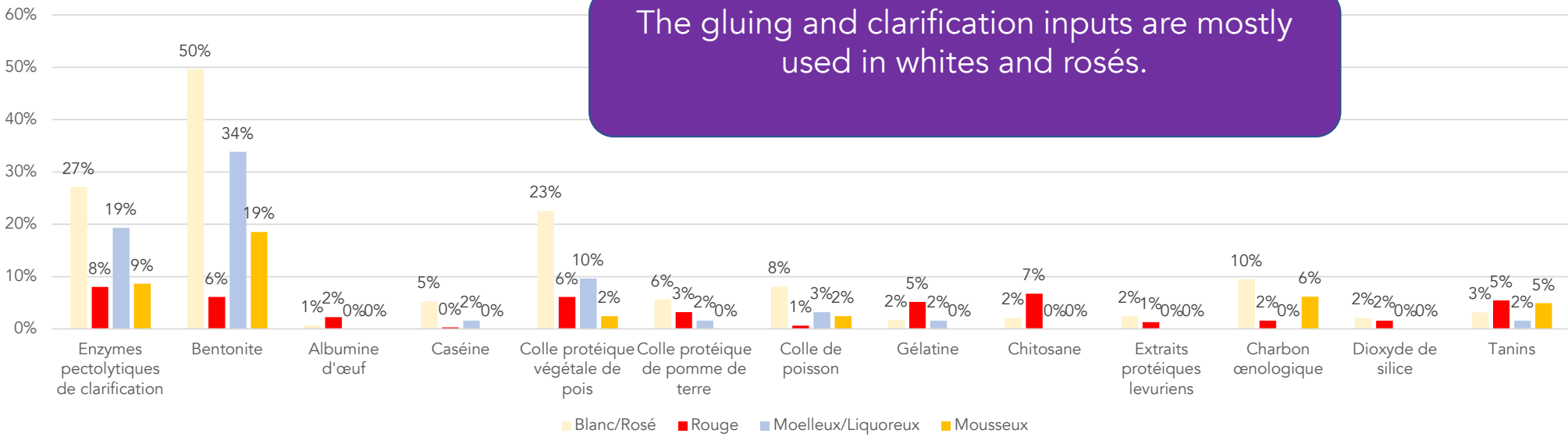
There is a stronger use of nutrition in white especially via ammonium phosphate.

Color distribution of the use of fermentation regulators - 2020



Color breakdown of the use of bonding products and clarification - 2020

The gluing and clarification inputs are mostly used in whites and rosés.

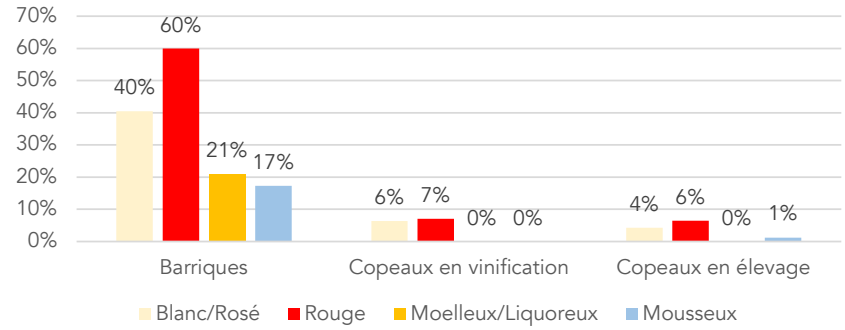


Focus by input types in 2020

Winemaking auxiliaries

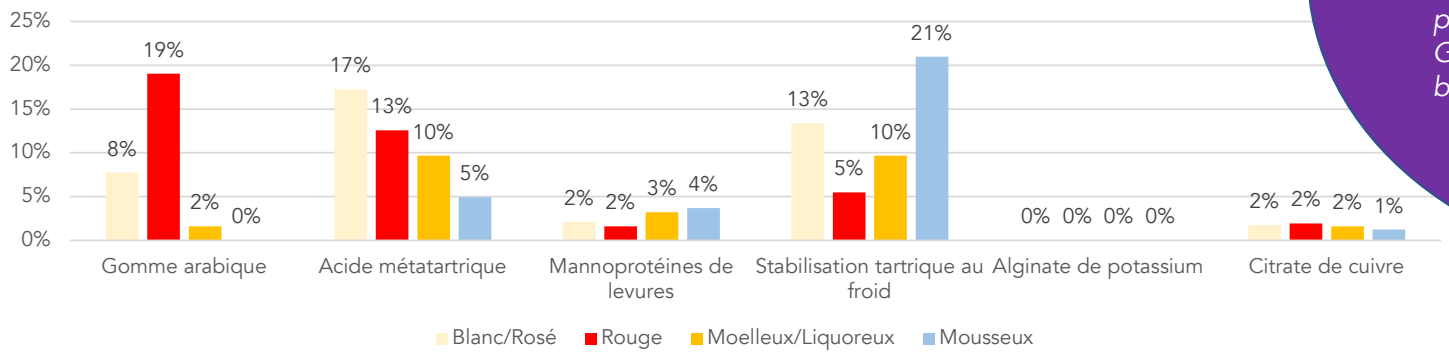
There is a limited use of chips in winemaking and ageing, even in red. The barrel remains mostly used in red unsurprisingly, followed by white and sweet.

Color distribution of wood use - 2020



Only a small part of the winegrowers use techniques for tartaric stabilization. The most used methods being meta tartaric acid or cold treatment this method being the most effective to ensure that there are no export problems.
Gum arabic is widely used in red because it is not very restrictive to use

Color distribution of the use of stabilizers and wine treatments - 2020

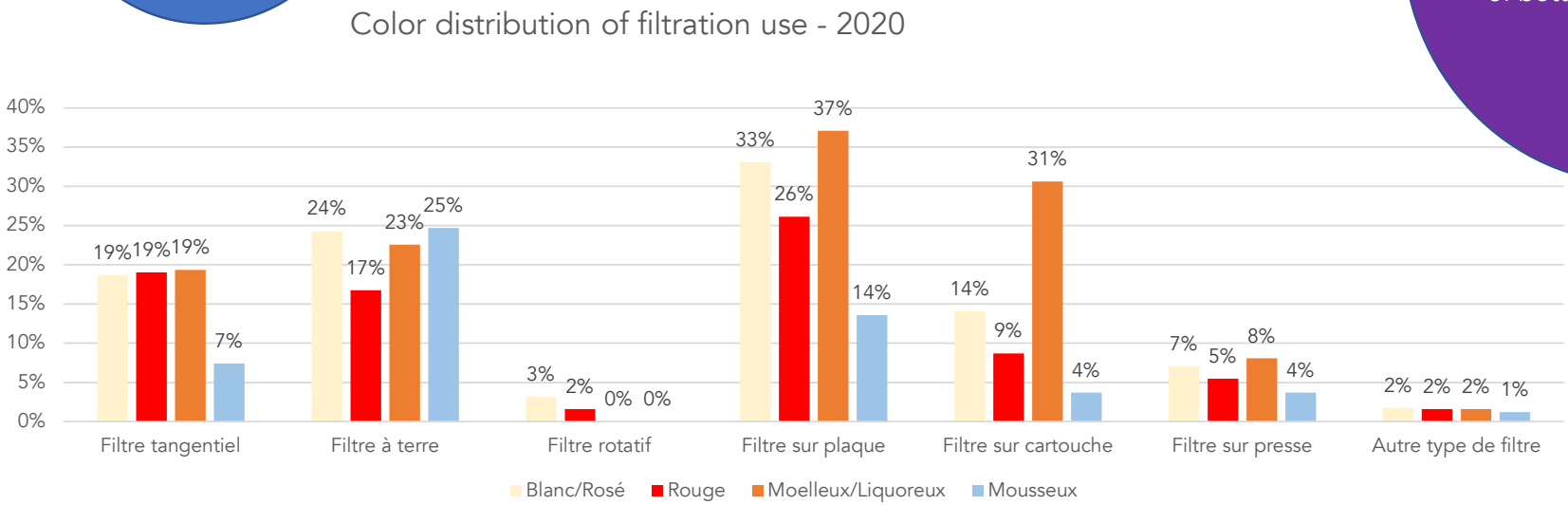


Focus by input types in 2020

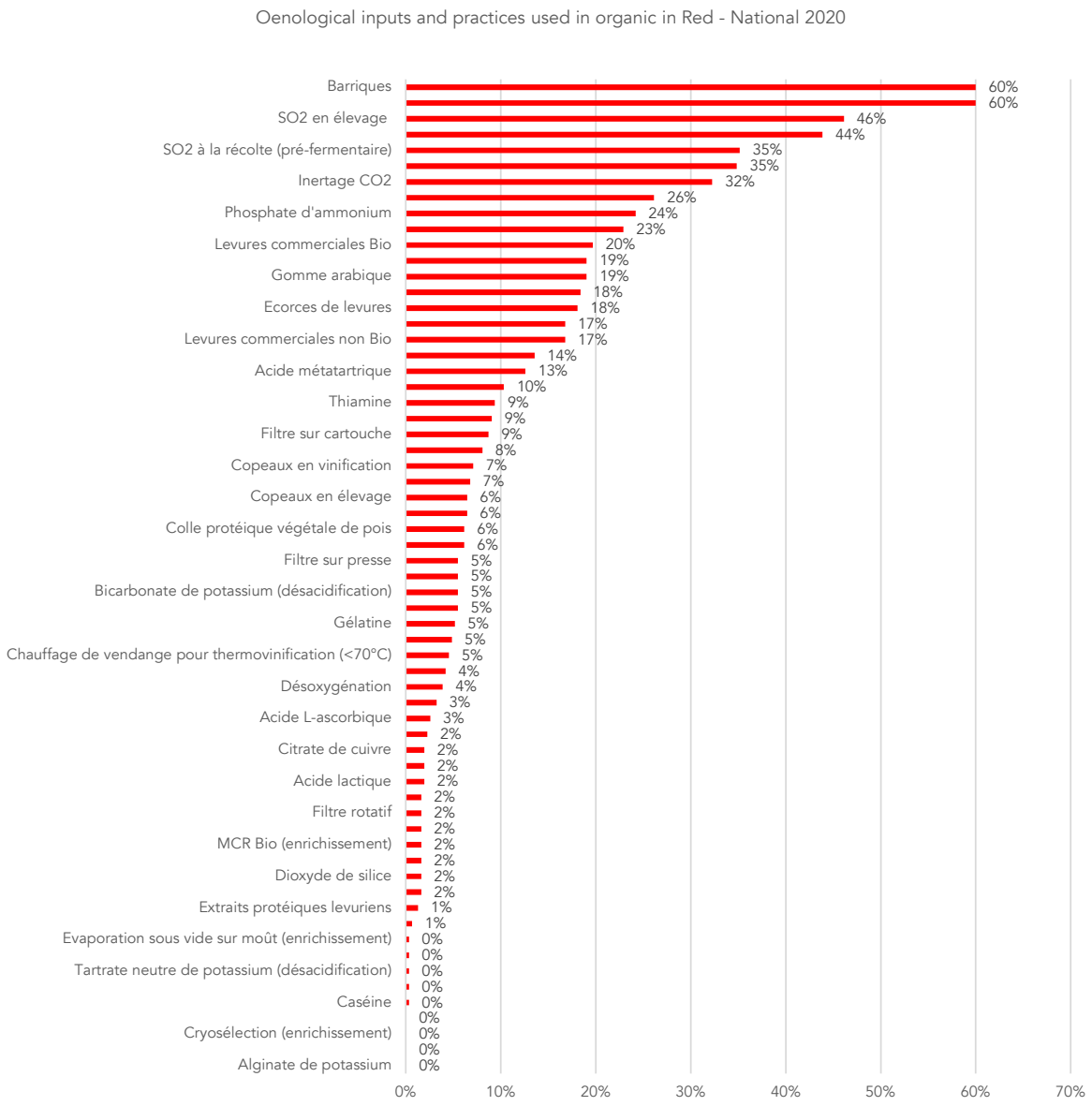
Filtration

Tangential filtration is becoming more democratic

Plate filtration remains the majority because it is it that is used at the time of bottling.



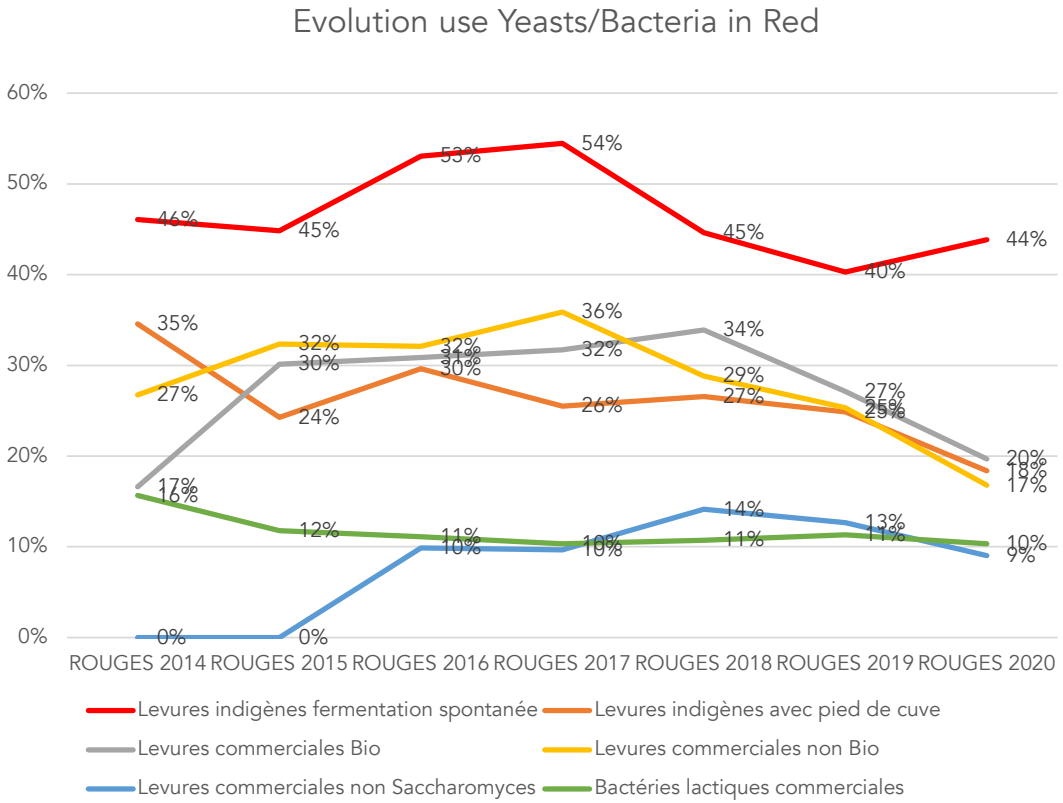
Focus on Red Wines

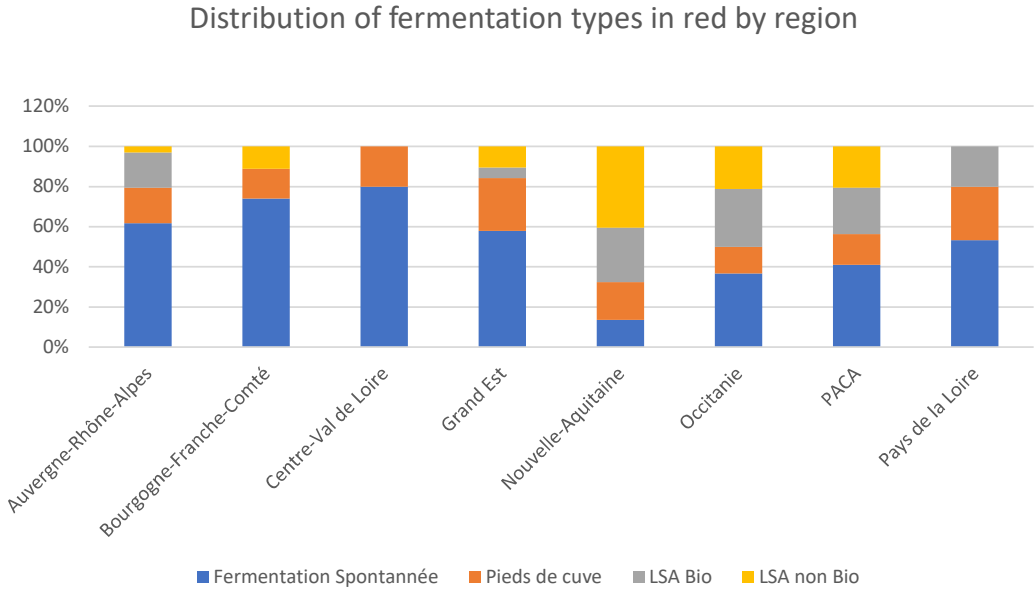


Focus red wines

Yeasts and bacteria

Indigenous fermentation, although majority has seen its use decrease since 2018, probably due to the difficulty of fermentability of musts.





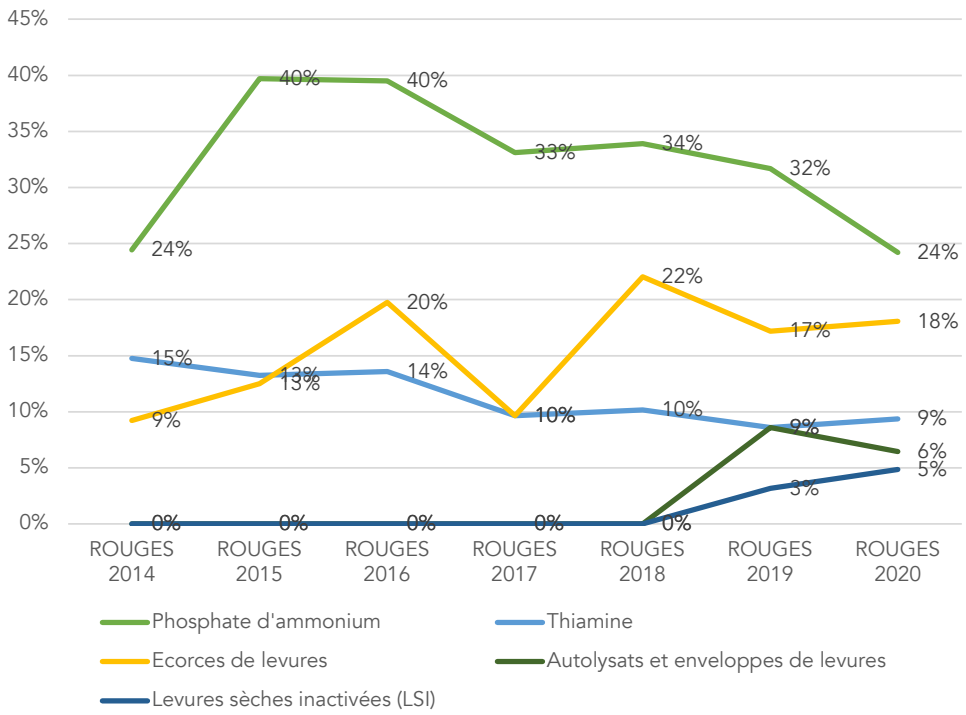
Warmer regions which are also areas of larger production in terms of farm size make greater use of fermentations with LSAs.

Focus red wines

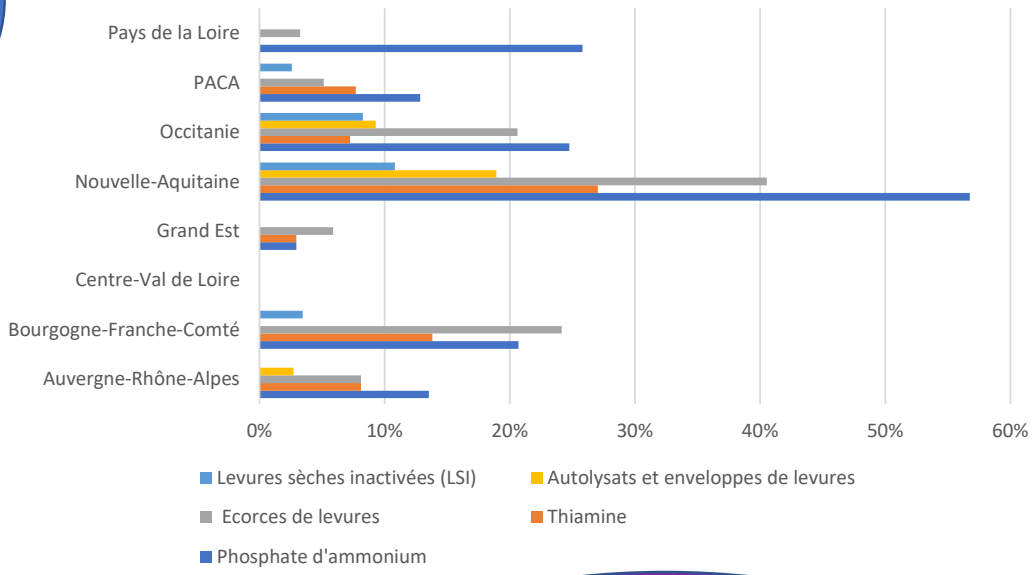
Nutrition

Mineral nutrition remains the majority because it is a priority in case of resorting to nutrition for the fermentation of wines. The fall in 2020 is probably due to the change of people surveyed.

Red fermentation regulators



Distribution of red wine nutrition according to regions

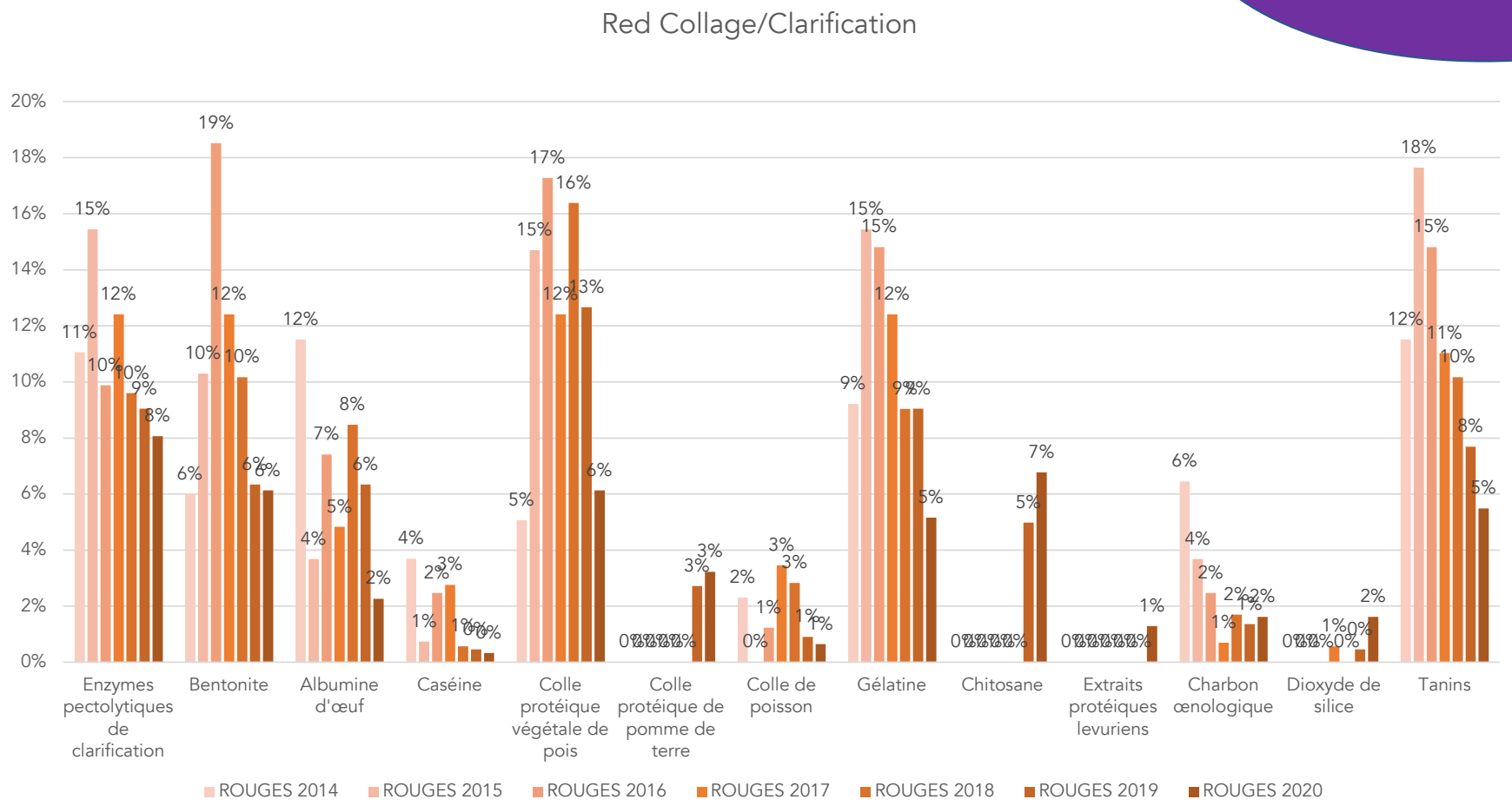


The level of use of nutrition may also need to be linked to the type of oenological monitoring of the different regions. The new Aquitaine region has a very important network and support in oenology. Oenologists tend to take less risk in the somewhat difficult years with high degrees as in 2020 in Nouvelle Aquitaine.

Focus red wines

All the possibilities of bonding inputs are used, varying according to the years but with percentages much lower than those of whites and rosés.

Collages/clarification



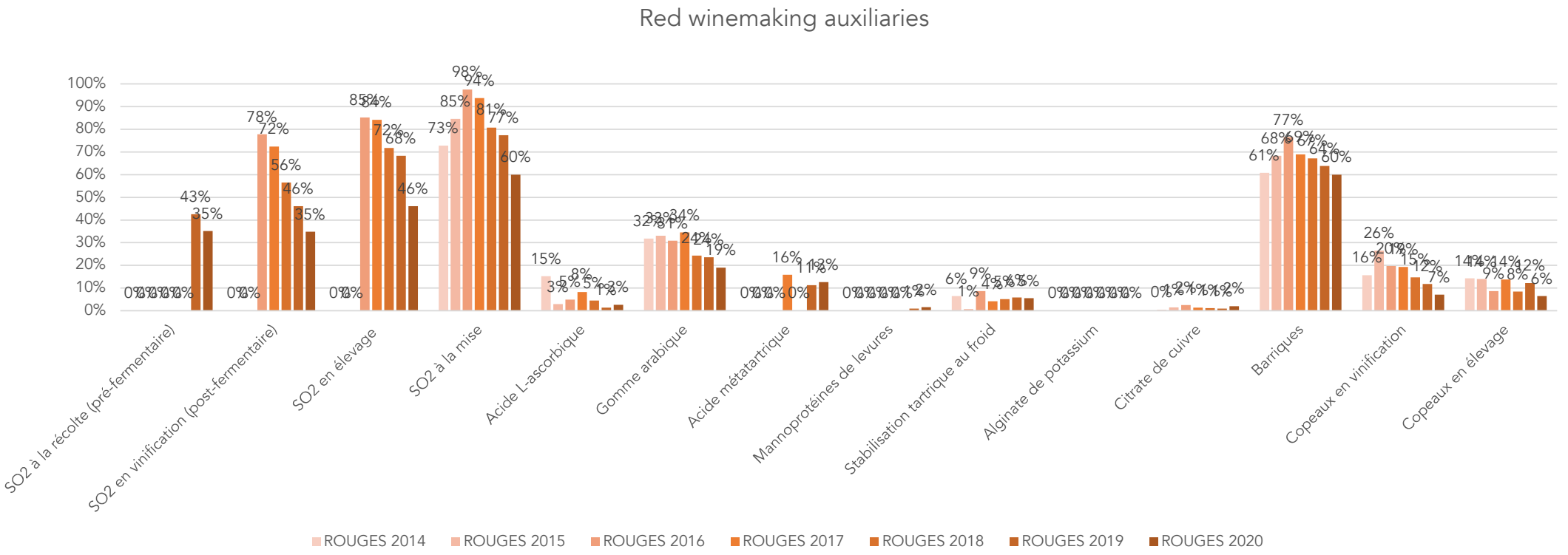
Focus red wines

SO2 and barrels are very widely used in red.

There is also a fairly significant use of gum arabic.

Chips seem to be little used by organic winegrowers.

Collages/clarification



Conclusions

-The practices of organic winegrowers on the 2020 vintage change little compared to previous vintages.

-The uses of permitted inputs and techniques remain low (less than 30% if we exclude SO2 and barrels and the whole range of tools made available by the Organic Wine regulation is used. The use of inputs or techniques is therefore generally reasoned in Organic.

-This survey confirms the existence of several schools of winemaking in Organic: on the one hand organic winemakers who try to do without inputs as much as possible. On the other hand, organic winegrowers who use a wider range of inputs to obtain a specific product profile, regular, constant over time, in order in particular to meet certain export requests.

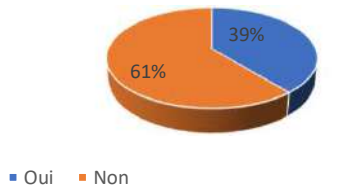
-The same phenomenon is also observed on the management of SO2, the development of organic cuvées "without added sulphites" responding to a growing demand, on the three colors. On these cuvées without SO2 it seems to emerge 2 families. Wines produced in smaller volumes with winemakers approaching the specifications of natural wine methods. And wines produced in larger volumes that have to use certain inputs such as yeasts or nitrogen nutrition to ensure the quality of these wines.

Wines without sulfite

Wines Without Added Sulphite

More than a third of organic winegrowers in France make so2-free cuvées

Make yourself a cuvée without SO2

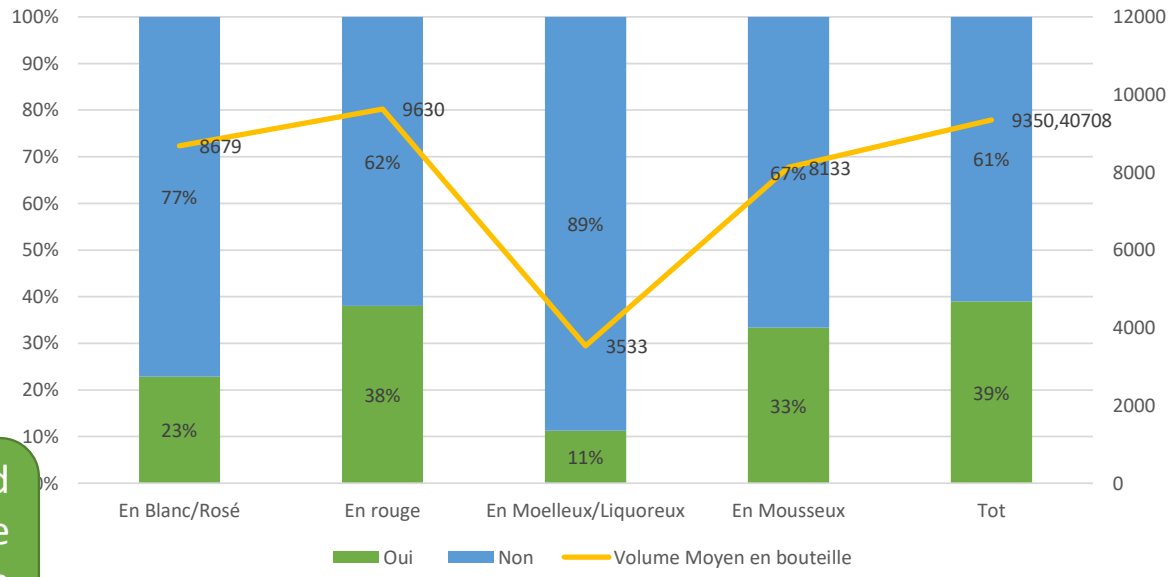


However, the phenomenon is anecdotal in bulk carriers

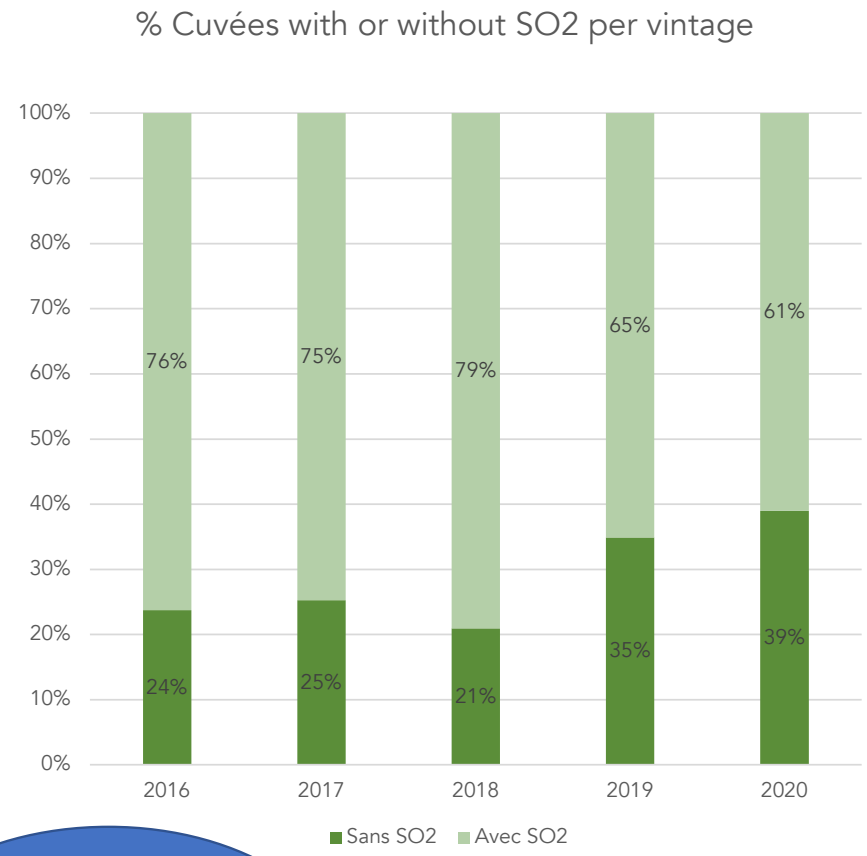
Make yourself bulk without SO2

Cuvées without SO2 are made mostly on red wines, the technique being easier to master.

Make yourself a bottle cuvée without SO2



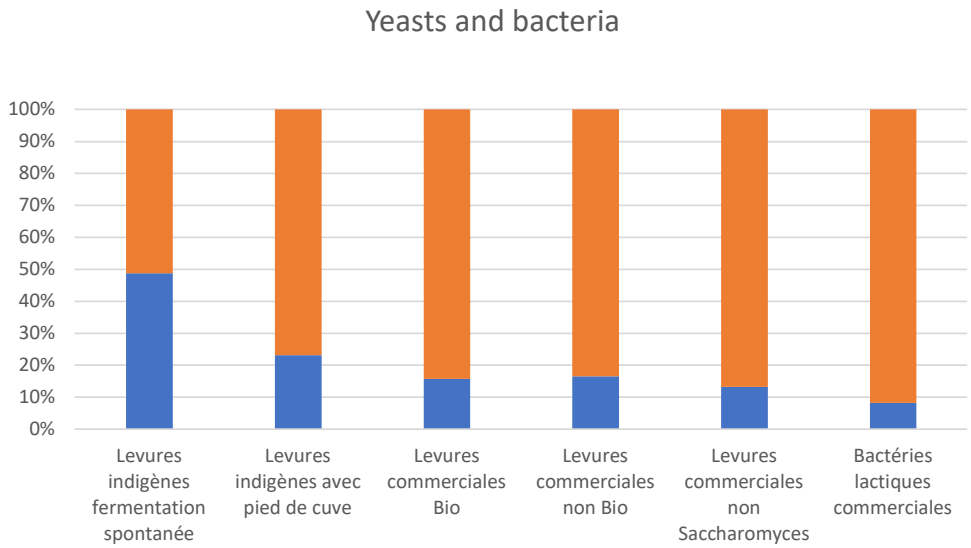
The average volumes produced in white and red are beginning to be relatively large. We have averages around 10,000 bottles for a few years in the survey.



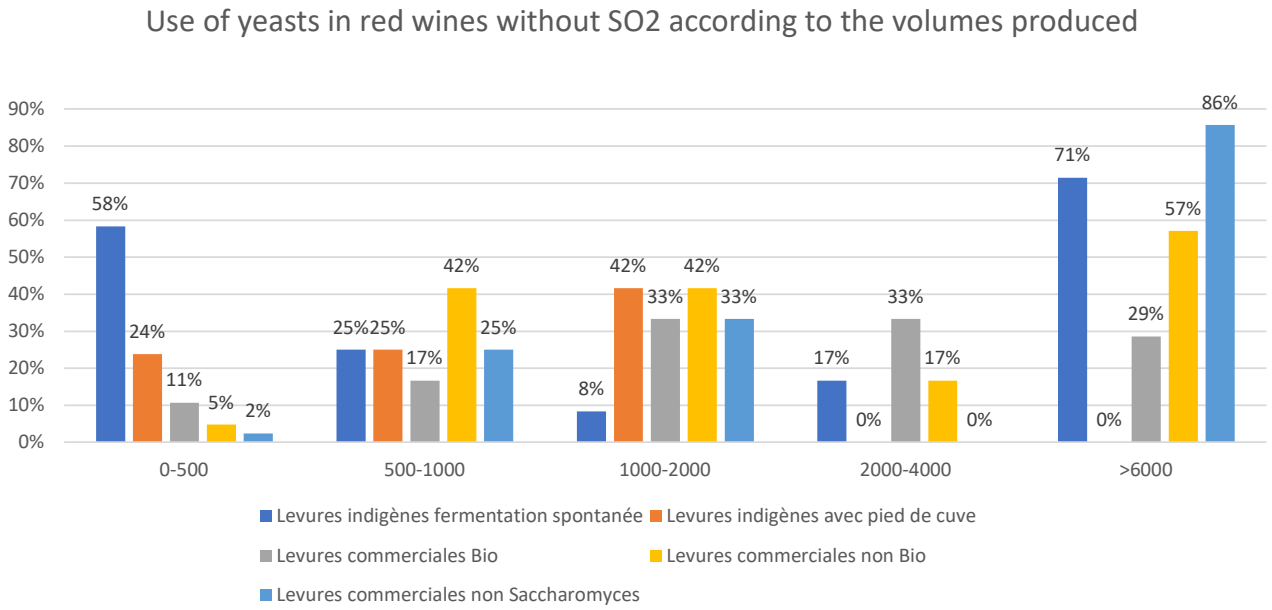
A steady increase in the production of SO2-free cuvée

Breakdown of the volumes produced by producers of red wine without added sulphite from the survey

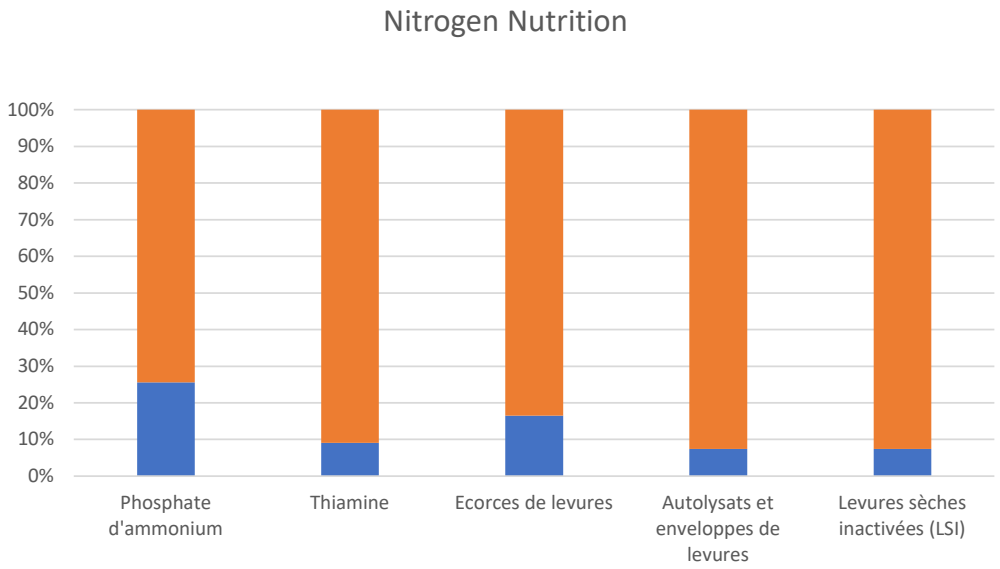
Tranche de volume en Hl	NOMBRE	Pourcentage
0-500	84	69%
500-1000	12	10%
1000-2000	12	10%
2000-4000	6	5%
>6000	7	6%

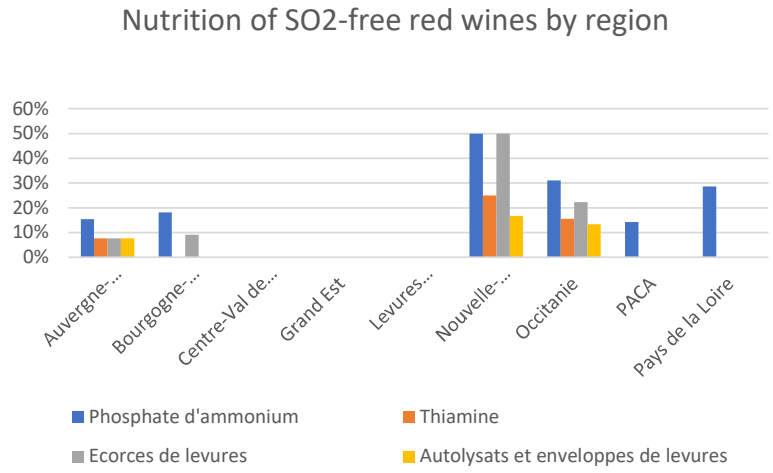


Concerning yeasts
We find a significant proportion of native yeasts with spontaneous fermentations and tank feet.
We find here the users of yeasts non-saccharomyces



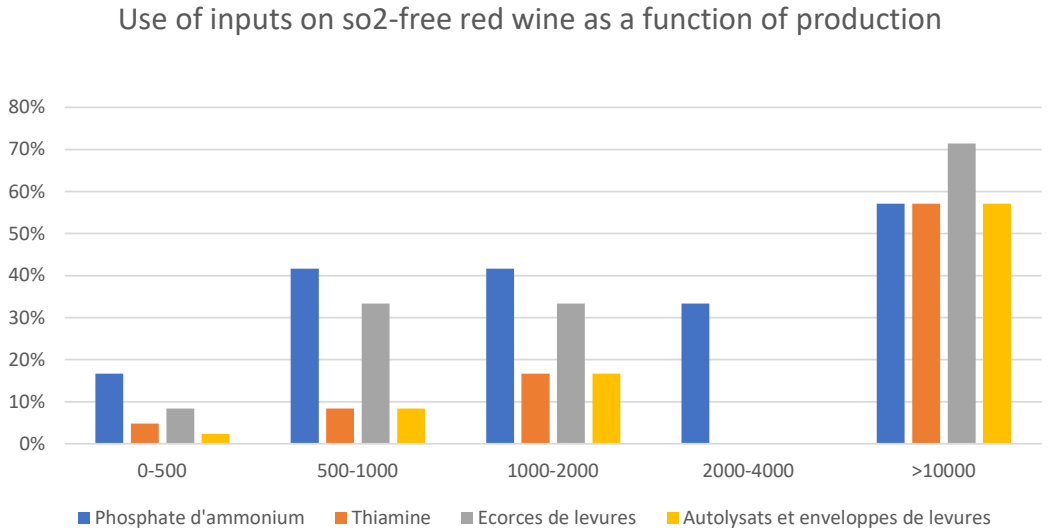
The use of commercial yeasts increases with the size of the production as well as the use of yeasts non-saccharomyces.
This is undoubtedly in order to secure the quality of the batches carried out

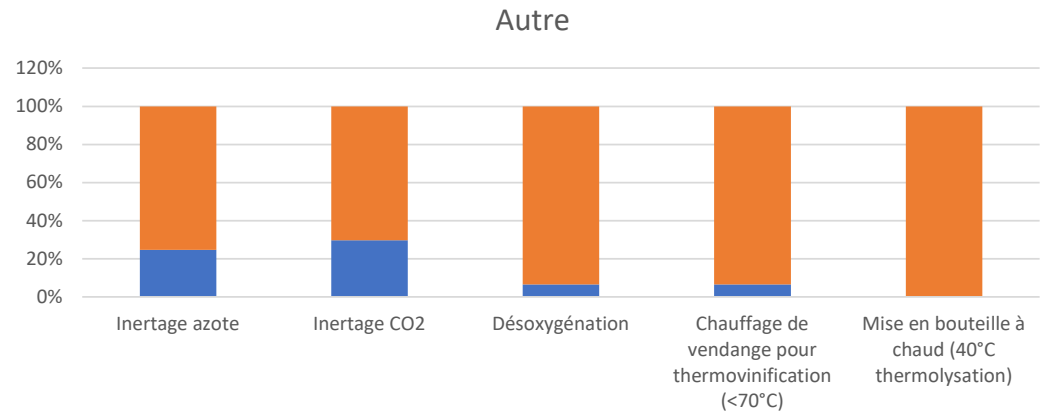




There is overall little use of nutrition approaching in this respect the specifications of wines natural method.

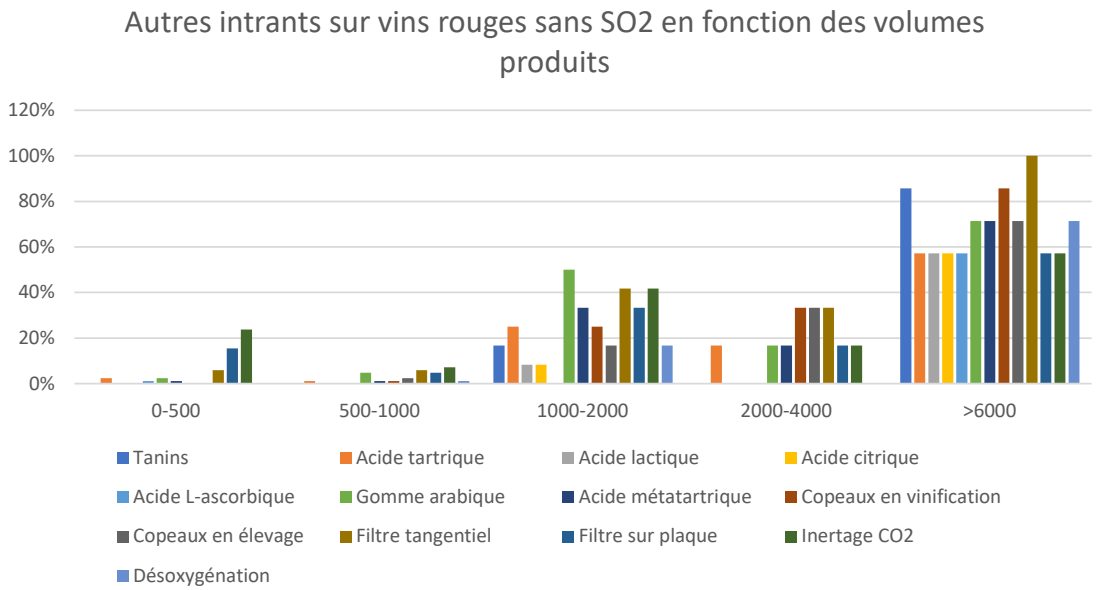
But as before we find a disparity between the regions and the types of wines made. There is a higher use of nutrition as well as yeast bark in regions with higher production and larger structure sizes





The use of gases is still quite low and this is in line with the field findings of a need for support on the management of dissolved gases for this type of wine.

There is greater use on other inputs for large volume producers. In particular, there is greater use of tangential filtration as well as chips and acidification.



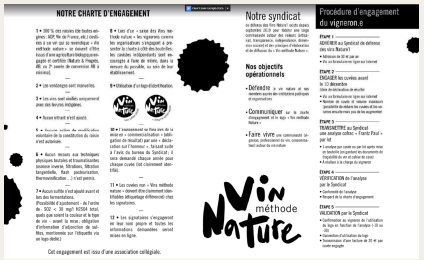
Contexte

A consumer and legislator's demand for naturalness on food products

A willingness not only for consumers but also for winemakers to reduce inputs

A need/desire to create new product profiles for their range and the story telling of winemakers and their products

A technical challenge



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SO2

Broad spectrum of action:

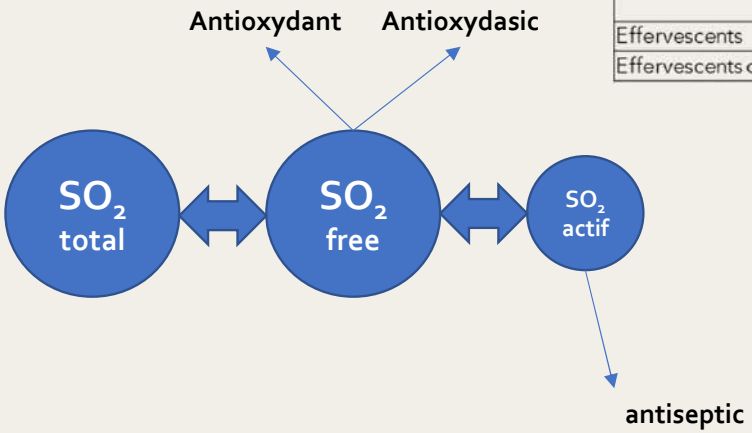
-Antioxydant

-Antioxydasic

-Microbiological stabilization

- Only a small part of the total SO2 is active
-
- MCO Recommendations: 0.7 mg/kg body weight

SO2 en mg/l	Rgt Européen OCM Viti-Vini N° 479/2008	(1) Rgt Européen BIO (CE) 889/2008 (2019)
	Total	Total
Vins rouges secs (< 2g/l sucre)	150	100
Vins rouges secs (≥ 2g/l et < 5g/l sucre)		170
Vins rouges (≥ 5g/l sucre) et demi-secs	200	150
Vins blancs/rosés secs (< 2g/l sucre)	200	150
Vins blancs/rosés secs (≥ 2g/l et < 5g/l sucre)		170
Vins blancs/rosés (≥ 5g/l sucre) et demi-secs	250	220
Vins blancs pour certaines AOP (dits "liquoreux")	400	370
Vins moelleux (>12 et < 45g/l sucre)	300	270
Vins doux (≥ 45g/l sucre)	200	170
Vin de liqueur (TAV > 15%)	200 (sucre >= 5g/l)	170 (sucre >= 5g/l)
Effervescents	235	205
Effervescents de qualité	185	155



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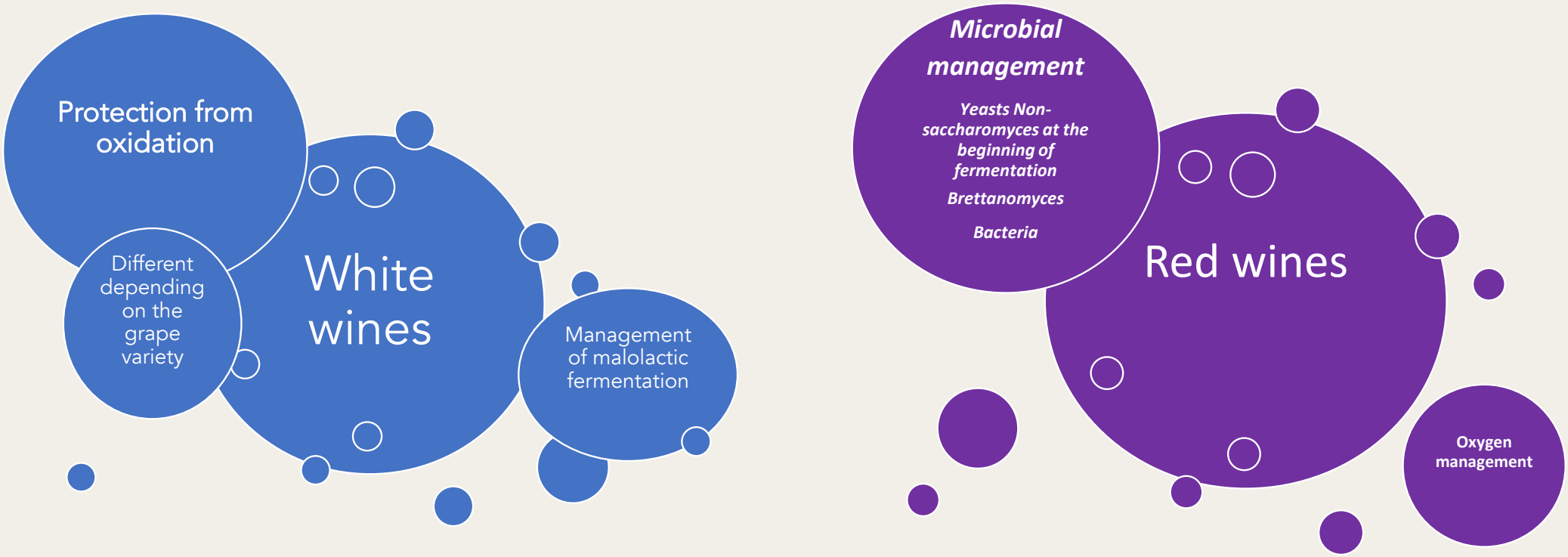
Wines without SO2



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Program to accompany the production of wines without SO2

RESPECT 2017/2020
So2-free wines: Characterization and implementation of microbiological and physical tools to make so2-free wines, from winemaking to bottling

Brettanomyces et tolérance au SO2
Characterization of Brettanomyces properties and tolerance to SO2

Vins de Bordeaux sans SO2 2017/2020
CIVB co-financing of the Respect project

Document and vidéos Vins sans SO2 2020/2021
FeADER Region Funding 1.2

2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

CASDAR Levain Bio 2012/2015
Native yeasts and bacteria: diversity analysis, fermentation test and selection

WILDWINE 2012/2015
Characterization and selection of yeasts and bacteria for mixed sourdough production including non-Saccharomyces yeasts

Bioprotection 2016/2017
Evaluation d'outils microbiologiques pourvinifications réaliser des sans SO2

Vins Sans 2021/2023
Suite de RESPECT
So2-free wines: Livestock and gas management
Impact on the structure and aroma of wines
Liquorous wines

Projet Chitosan 2021/2023
Suite de RESPECT
Brettanomyces management
Management of malolactic fermentation in white wine without SO2

Les domaines de recherche :

Microbiologie | Vinification sans SO2 | Diffusions

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Research

An articulation of projects on three scales:

fundamental research: to better understand the mechanisms and develop analytical tools

controlled tests: To control the bays

Field:
-Needs land and feedback on existing practices
-Real-world tests
-Communication on trials/results

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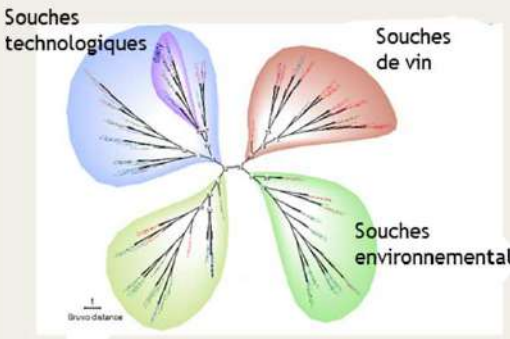
Projet CASDAR levain Bio et WILDWINE 2012/2015

-Understanding the mechanisms of early fermentation

-Characterization of yeast and bacteria populations that are a key element in the management of good fermentation and therefore of the production of wines without S02

-Development of analytical tools, especially on non-saccharomyces that will be used in so2-free wine projects



Diversité génétique. delbrueckii

Diversité Oenococcus oeni

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Projet Bioprotection 2016/2017

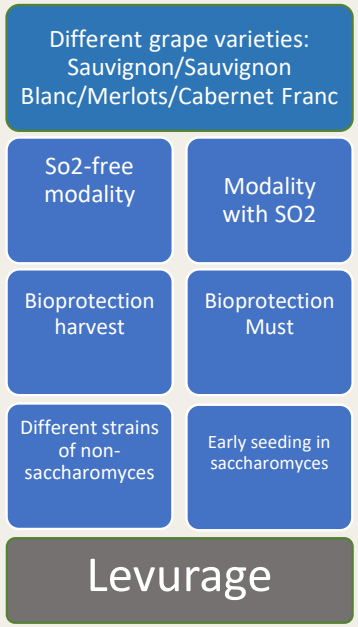
"Evaluation of the impact of so2-free winemaking tools, including "bio-protective" yeast-based preparations, Sacch- and/or Non-Saccharomyces, with the aim of making wines without SO2."

Impact on the occupation of microbiological space (yeasts - bacteria)

Impact on oxidation of musts and wines

Impact on alcoholic fermentation

Aromatic impact



Highlighting the importance of good fermentation management

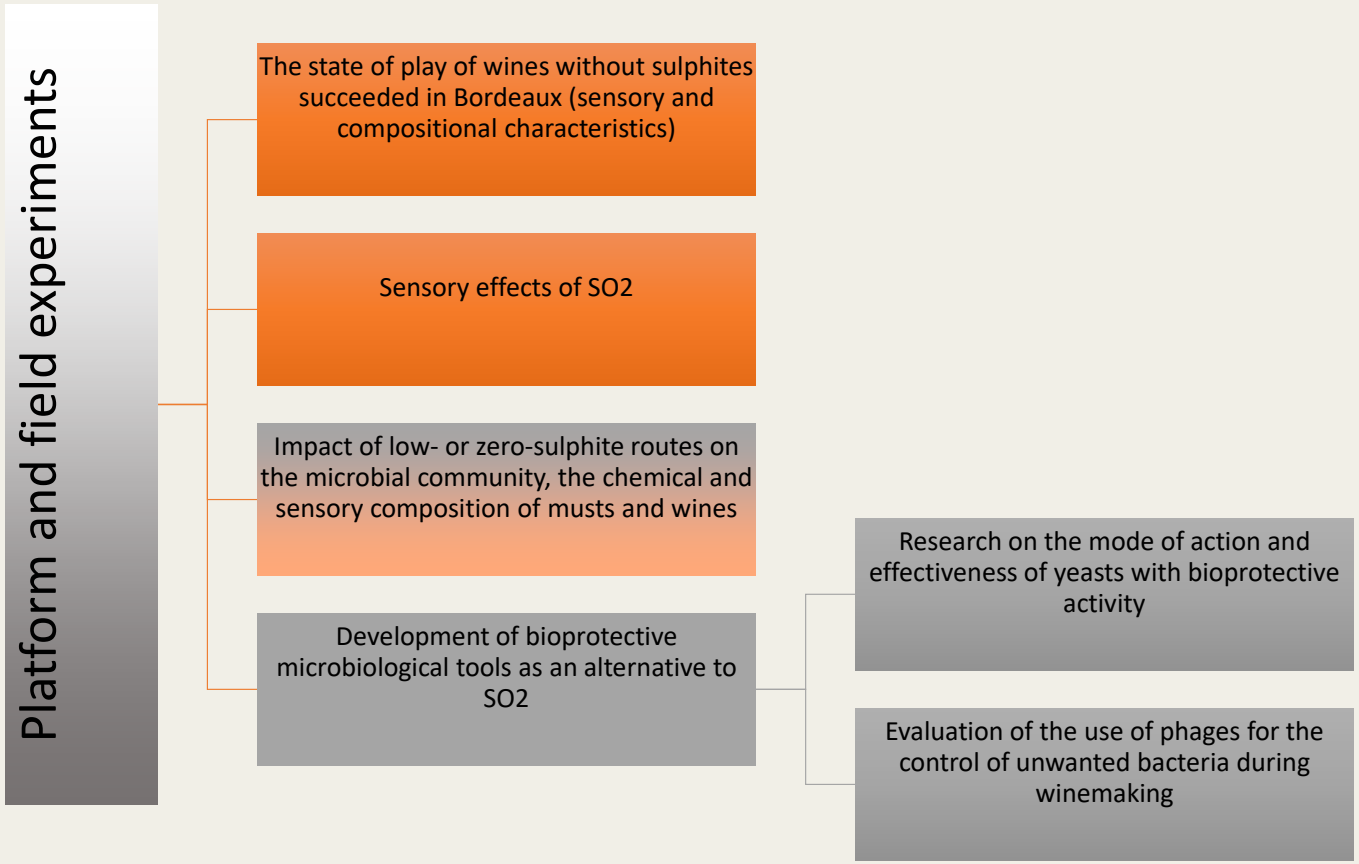
Interest in early adding yeast with LSA or Tank foot

First results on bioprotection and are of interest in certain situations especially in cold pre fermentation phases on the management of acetic bacteria and oxidation of mutts

Rem: many winemakers realize and begin to master fermentation without SO2 on red wine

VIGNERONS BIO NOUVELLE AQUITAINE

Respect/Vin de Bordeaux without SO2 2018/2020



VIGNERONS BIO
NOUVELLE AQUITAINE

Respect/Vin de Bordeaux sans SO2 2018/2020

It aims to answer three questions:

-Do successful red wines from Bordeaux grape varieties and sulphite-free products have their own distinctiveness?

-What are the compositional and sensory consequences of the absence of SO2?

-What are the technical routes suitable for the successful development of these types of wines?

VIGNERONS BIO
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Evaluation of the quality of so2-free wines

SANS SULFITES AJOUTÉS

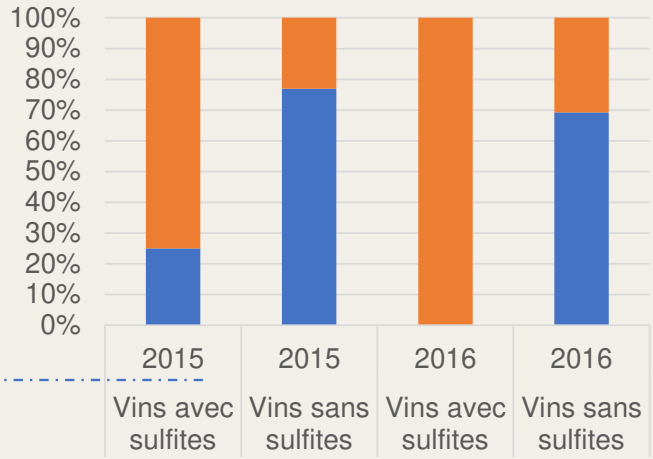
CONTAINS SULPHITES

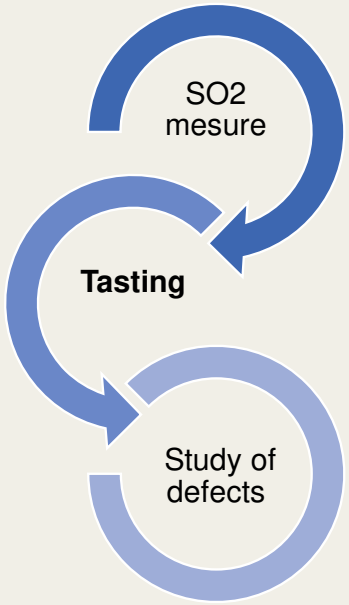
Commercial wines

52 vins
- 26 millésime 2015
- 26 millésime 2016

20 vins
- 12 millésime 2015
- 8 millésime 2016

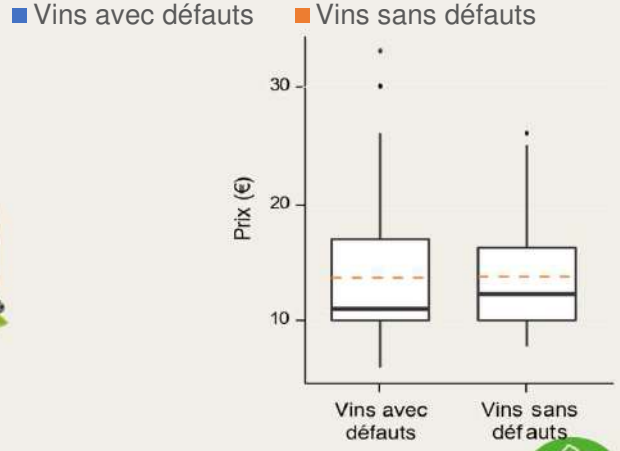
Proportions of wines with and without defects





- 8 expert tasters
- Does the wine have a defect?
- If so, which one?
- Test for '2 presence/no defect'

(fréquence de partage entre dégustateurs > 60%)

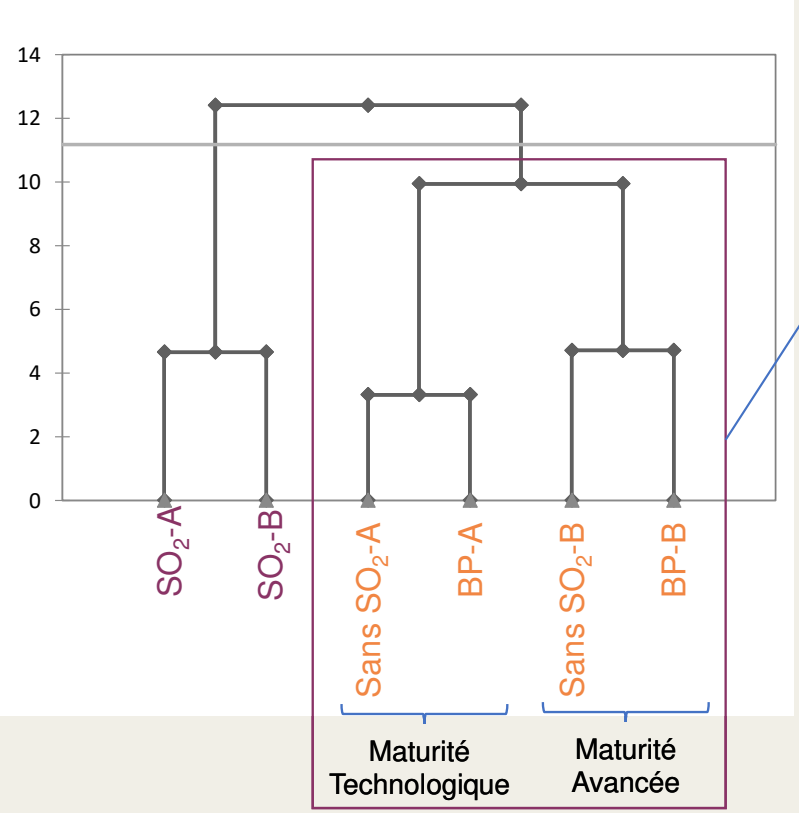


- **Défauts majoritairement liés à l'oxydation et aux micro-organismes d'altération**
- **Pas de lien entre le prix et l'occurrence des défauts**

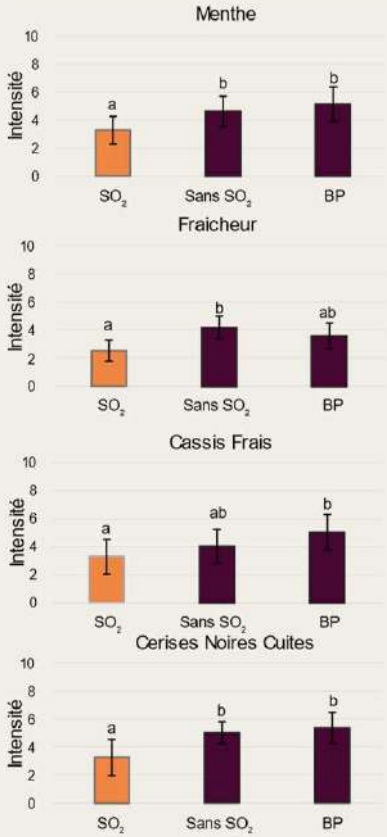
VIGNERONS BIO NOUVELLE AQUITAINE

Do successful red wines from Bordeaux grape varieties and sulphite-free products have their own distinctiveness?

Sensory profile



4 descriptors discriminate 200 wines without sulphites
Mint - Fresh Cassis - Cooked Black Cherries
Freshness



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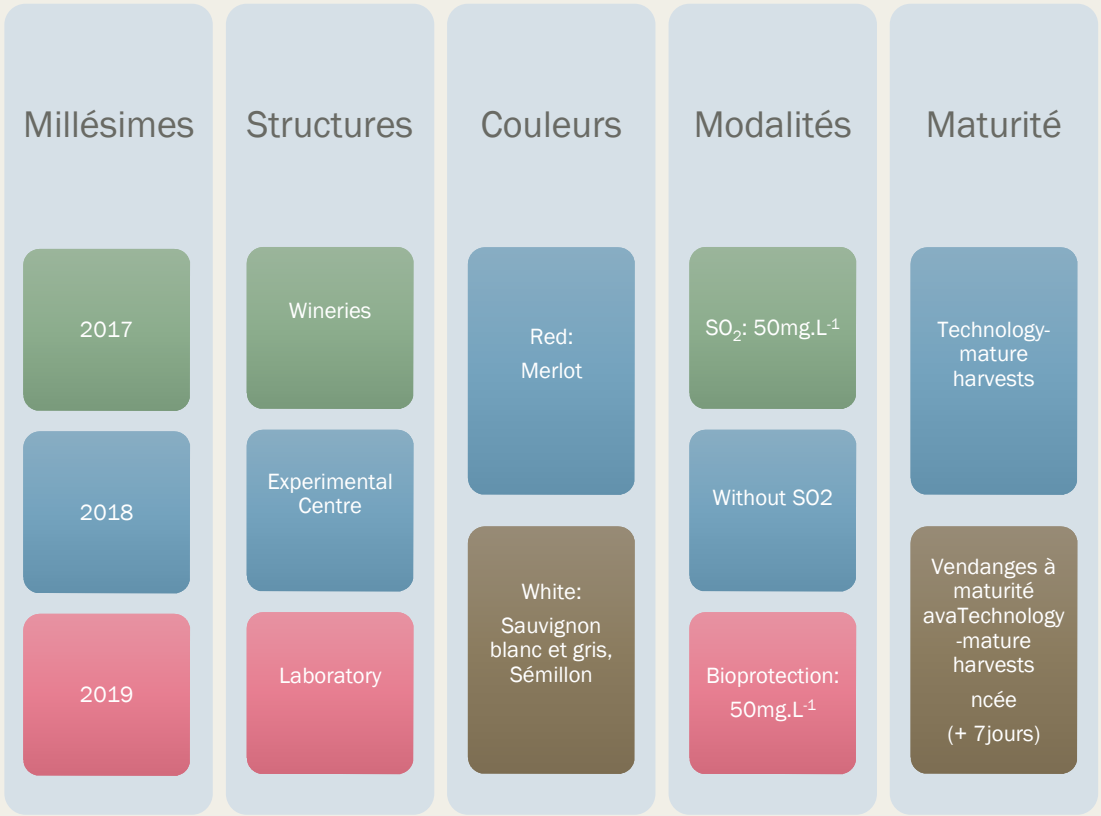
Experimentation



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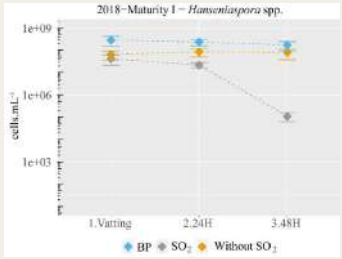
Summary of results

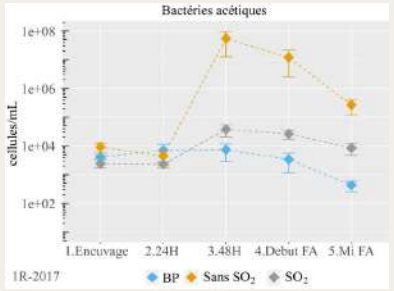
General

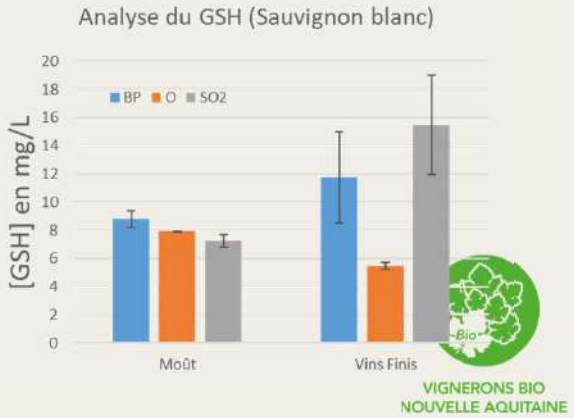
- Yeast diversity decreases during the preferred phase of red winemaking, especially in the absence of sulphur dioxide
- In spontaneous fermentation, the diversity of S. cerevisiae strains drops in the presence of sulphur dioxide
- Negative impact of sulphur dioxide on *Hanseniaspora uvarum*



Bioprotection

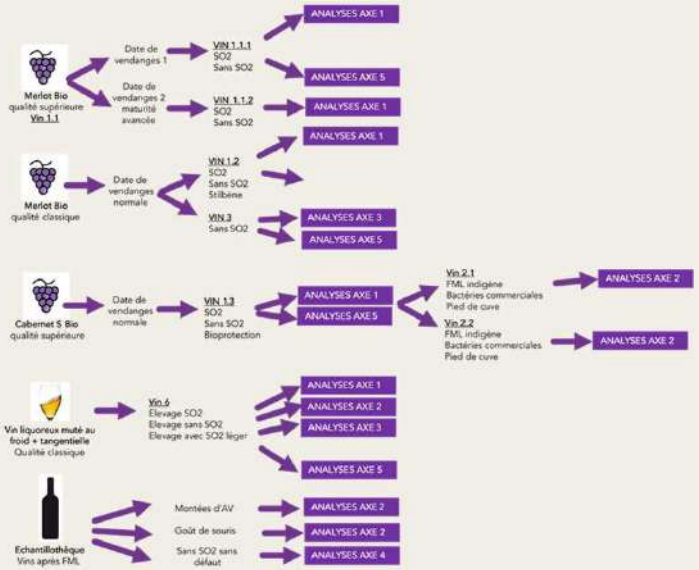
- Bioprotection colonizes the environment and limits the growth of acetic bacteria
- Low impact of bioprotection on *Hanseniaspora uvarum*
- Bioprotection partially protects white musts from oxidation phenomena





"Wines without" perspective and future work

AXE	Responsible	PROBLEMATIQUE OWNS
1. Vinification without SO2, microbiological impact	Isabelle Masneuf	Climate change context: vinifying grapes with advanced maturity without SO2
2. Bacteria management in livestock	Patrick Lucas	What impact does so2-free farming have on microbial populations? What impact does this have on volatile acidity? Work on mouse tastes (characterization, training of winemakers and winemakers, management tools...)
3. Management of farmed and bottling gases	Rémy Ghidossi	Better control of oxidative phenomena in breeding without SO2 by playing on the supply of gas. Influence of CO2-saturated farms
4. So2-free breeding, impact on phenolic compounds	Mickaël Jourdes	What influence of so2-free breeding on tannins and anthocyanins?
5. Breeding without SO2, impact on aromatic	Jean-Christophe Barbe	Alternatives to SO2 to fight defects. Analytic characterization of so2-free winemaking routes
6. Sweet wines without SO2	Jean-Christophe Barbe	Field application for the production of sweets without S02/ Compilation of existing tools in liquorice to do without SO2 and implementation of a protocol for making sweets without SO2



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« Vins sans » partie chitosan

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And on the estate

Winemaking without SO2

In red wine

- Acquired in Red Vinification and increasingly developed
- Bio-protection as a tool for implementation in the early years: reinsurance tools
- Majority use of early seeding in LSA of reception or on the harvest

The main principles:

-Managing a good, fast and frank alcoholic fermentation

-Management of a good rapid and frank malolactic fermentation co-inoculation is practiced but is not majority

This includes

-Good temperature control

-Good management of the nitrogen nutrition of these wines

-Healthy and not too advanced harvests in maturity (technological and phenolic)

-Good oxygenation of fermenting juices

It is best not to start removing SO2 at the same time making native fermentations.
It is better to proceed in stages

In White Wine

-Many trials among winemakers still in progress

-Difficulty mastering oxidation especially on Sauvignon

-Difficulty managing malolactic fermentation

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Aeging without SO2

-Bottled often early before the heat returns in the spring in March
-Filtering wines before entering the winter
-Important CO2 management
-Development of the use of new tools: Chitosan

For wines without long-aged SO2

-O2 and CO2 gas control: two schools for gas management
-need for temperature regulation of conservation cellars (cuves or barrels)
-Enhanced microbiological control
-Management of rackings/and Mircrobean populations

Bottling

-Tangential filtering
-gas management at bottling (O2/CO2)
-Bottling under Azote

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Labeling of WINES WITHOUT ADDED SULPHITES
ETIQUETAGE

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Allegation

"Wine without added sulphites"

"It may appear on the label of any wine, as long as the operator can prove that no sulphite was used in the manufacture of the product.

However, if sulphite levels are > 10mg/l (SO2T), the word "contains sulphites" is mandatory."

- OIV -

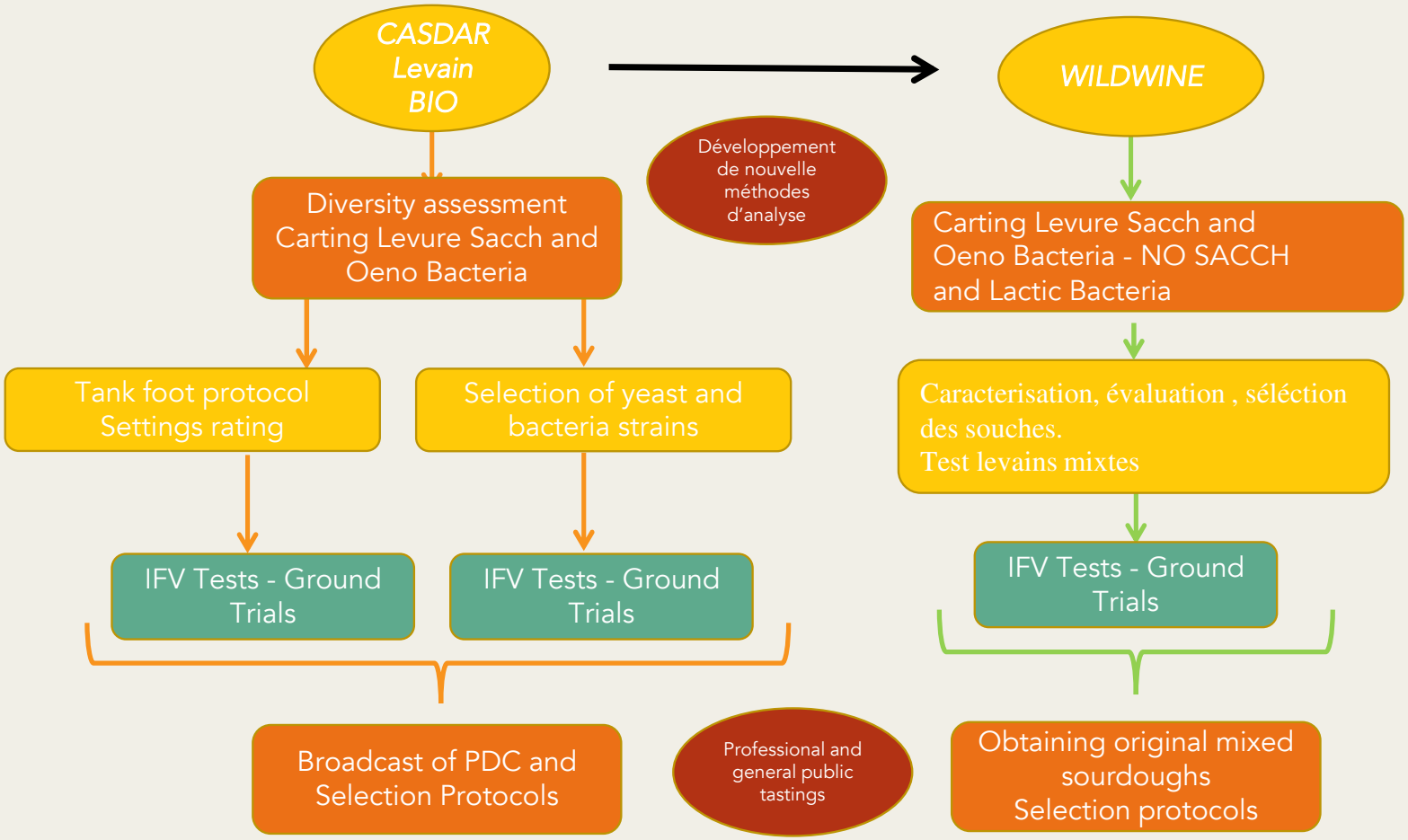
Yes	0 SO2 Vinification + SO2 Total < 10 mg/L
Yes	0 SO2 Vinification + SO2 Total > 10 mg/L Mention: "Contains sulphites" mandatory
No	SO2 vinification but SO2 Total < 10 mg/L
No	SO2 vinification SO2 Total > 10 mg/L Mention: "Contains sulphites" mandatory

Rem : You have to do a specified analysis for wine without SO2 like Frantz Paul.
The enzymatic analysis have to much uncertainty for low level of sulfite and the level detect will be higher than 10 mg/L

Indigenous fermentation

Project CASDAR Levain BIO

protocol



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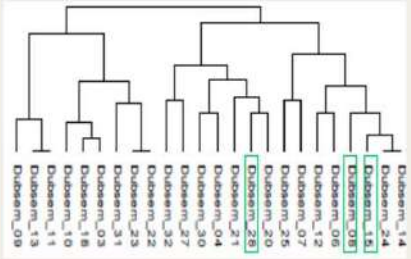
Selection of FA strains

method



ISVV

In a castle:
- Diversity analysis
- Strain isolation

Synthetic Must Preselection
- Fermentary Kinetics
- Chemical analysis

Natural Must selection
- Fermentary Kinetics
- Chemical analysis
- H2S test for yeasts
- Biogenic amines test for bacteria

IFV

Production of cream to test the strain in vat strain at the IFV

Châteaux

Production of cream to test the strain at the estate

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NOUVELLE AQUITAINE

CURRENT CONTEXT

problematic:

	benefits	Disadvantages
Commercial Yeast	-Quantitative and qualitative mastery -"pure guaranteed strain" -Quick and simple implementation	-Buying -Minimum dose to be respected
Spontaneous natives	-No purchase -Diversity of strains -Typicity	-Heavy implementation -Unknown native population -Possibility of unnecessary or harmful yeasts -Random success
PDC	-No purchase -Diversity of strains -Typicity	-Heavy implementation -Unknown native population -Possibility of unnecessary or harmful yeasts -Random success
Selected natives	-Physiological quality mastery -Better sourdough control	-Heavy implementation -Precaution to avoid contamination -Costly

→ **Mastering tools**

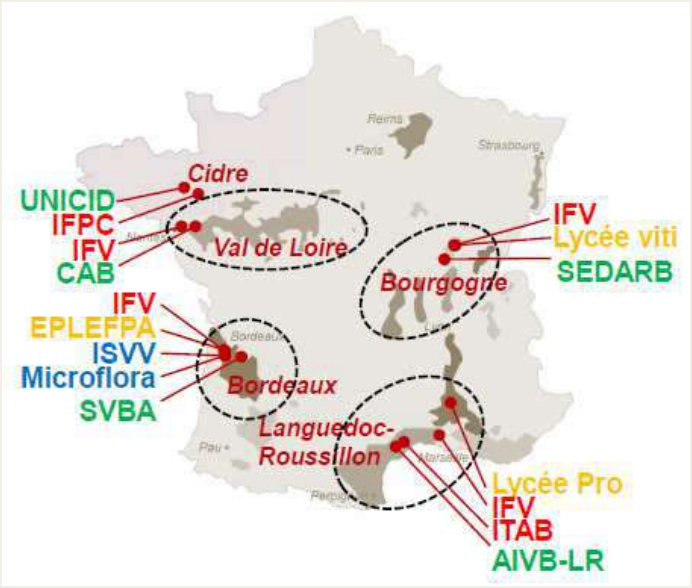
VIGNERONS BIO NOUVELLE AQUITAINE

CASDAR PROJECT « LEVAIN BIO »





Improving the quality of organic wines and ciders obtained through the use of native yeasts and bacteria



Projet National

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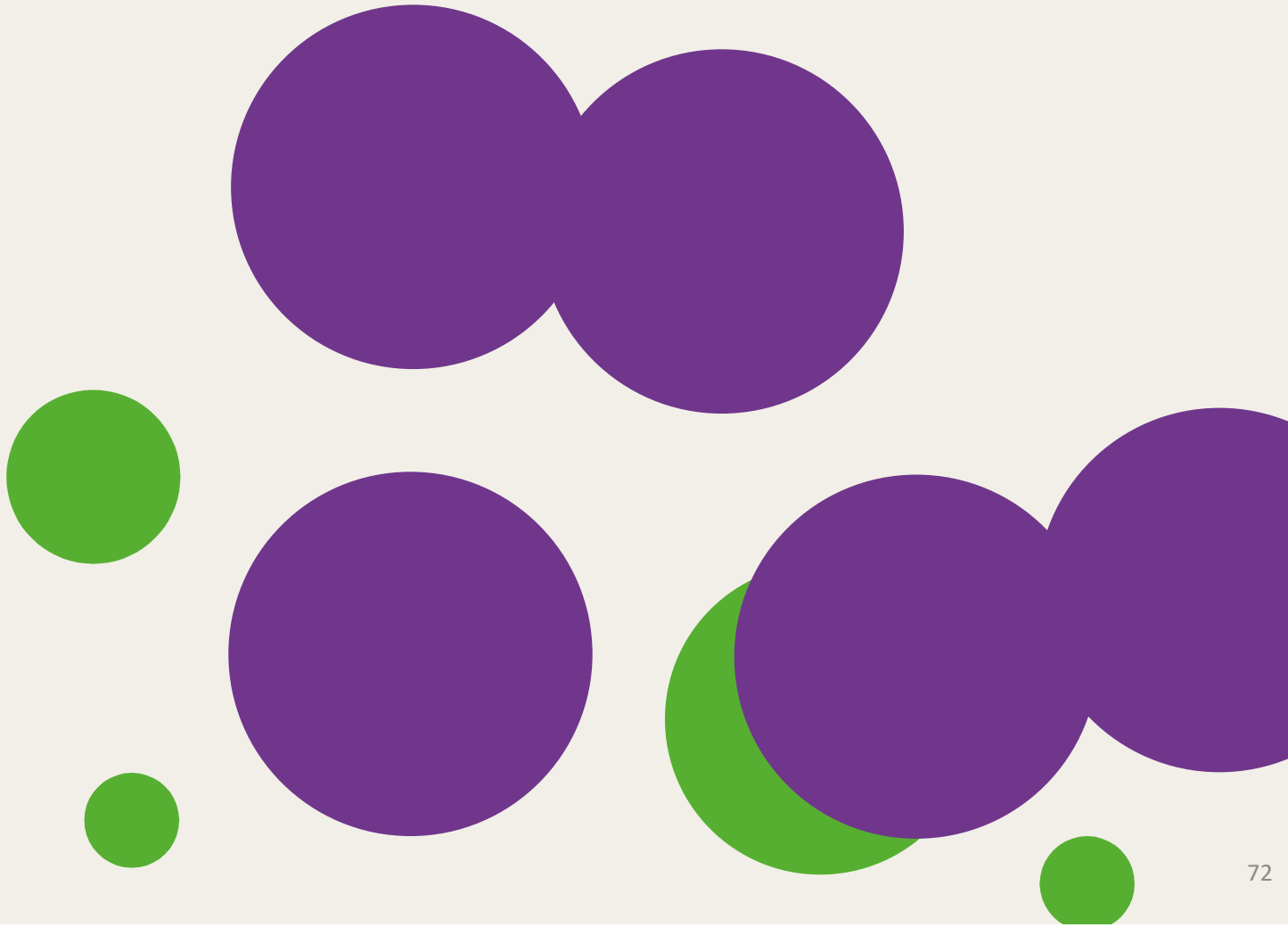
Diversity



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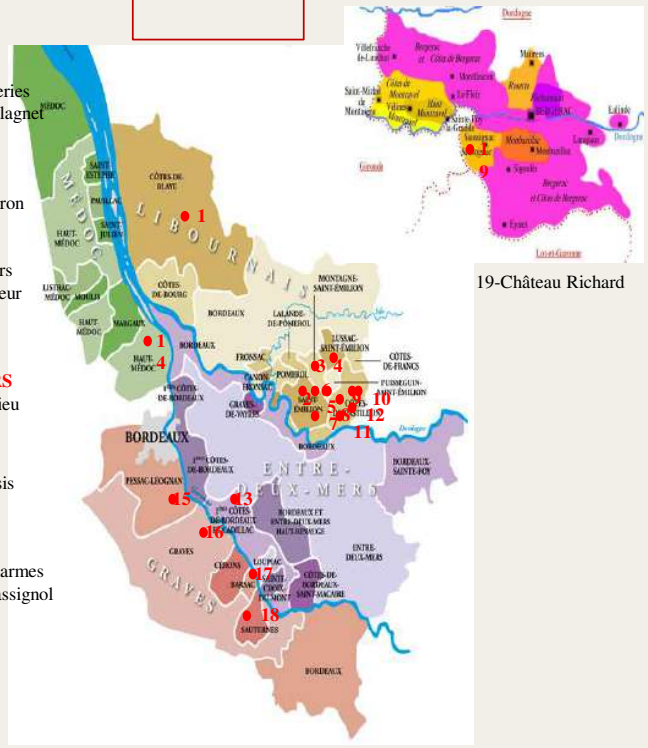
Mapping the diversity of yeast and bacteria strains in Aquitaine

ACTION 1

Yeast



LIBOURNAIS
1-Château les Minauderies
2-Château Moulin de lagnet
3-Lycée Montagne
4-Château Bellevue
5-Château Dubourg
6-Château Franc Boudron
7-Château Lateyron
8-Château Brandeau
9-Châteaux des Rochers
10-Château Franc la fleur
11-Clos Puy Arnaud
12-Château Beynat

ENTRE DEUX MERS
13-Château Du bourdieu

MEDOC
14-Closerie des Moussis

GRAVES
15-Château Baulos Charmes
16-Château Bichon Cassignol
17-Château Climents
18-Château Guiraud

19-Château Richard

Bacteria

LIBOURNAIS
1-Château de Piote
2 -Château Rioublanc
3 -Château La croix de Roche
4 -Château Annereaux
5 -Châteaux Beauregard
6 -Château Moulin de lagnet
7 -Lycée Montagne
8-Château Bellevue
9 -Château Laroque
10- Château d'Arcole
11 -Château Beynat
12 -Château Tour haut balette
13 -Château Brandeau
14 -Château La Peyrere OU LA CROIX

ENTRE DEUX MERS
15- Château d'Esther
16 -Château Lavergne dulong
17 -Château Moulin de Peyronin
18-Château Du bourdieu

MEDOC
19 -Château Segue longue
20 -Château Micalet
21 -Closerie des Moussis

GRAVES
22-Château Baulos Charmes
23 -Château Bichon Cassignol
24 -Château Guiraud

25-Château Richard
26-Château Tuquet Monceau
27-Domaine ancienne cure
28-Château Grinou

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ACTION 1

Genetic analysis and comparison of yeasts from regions and production sites :

PCR delta: Differentiating Saccharomyces.cerevisiae strains
Microsatellites: Genetic proximity of Saccharomyces.cerevisiae strains

-75% of the strains identified are of the species S. cerevisiae (287 clones)
- 5% to other yeasts of the genus Saccharomyces
- 20% to non-Saccharomyces species.

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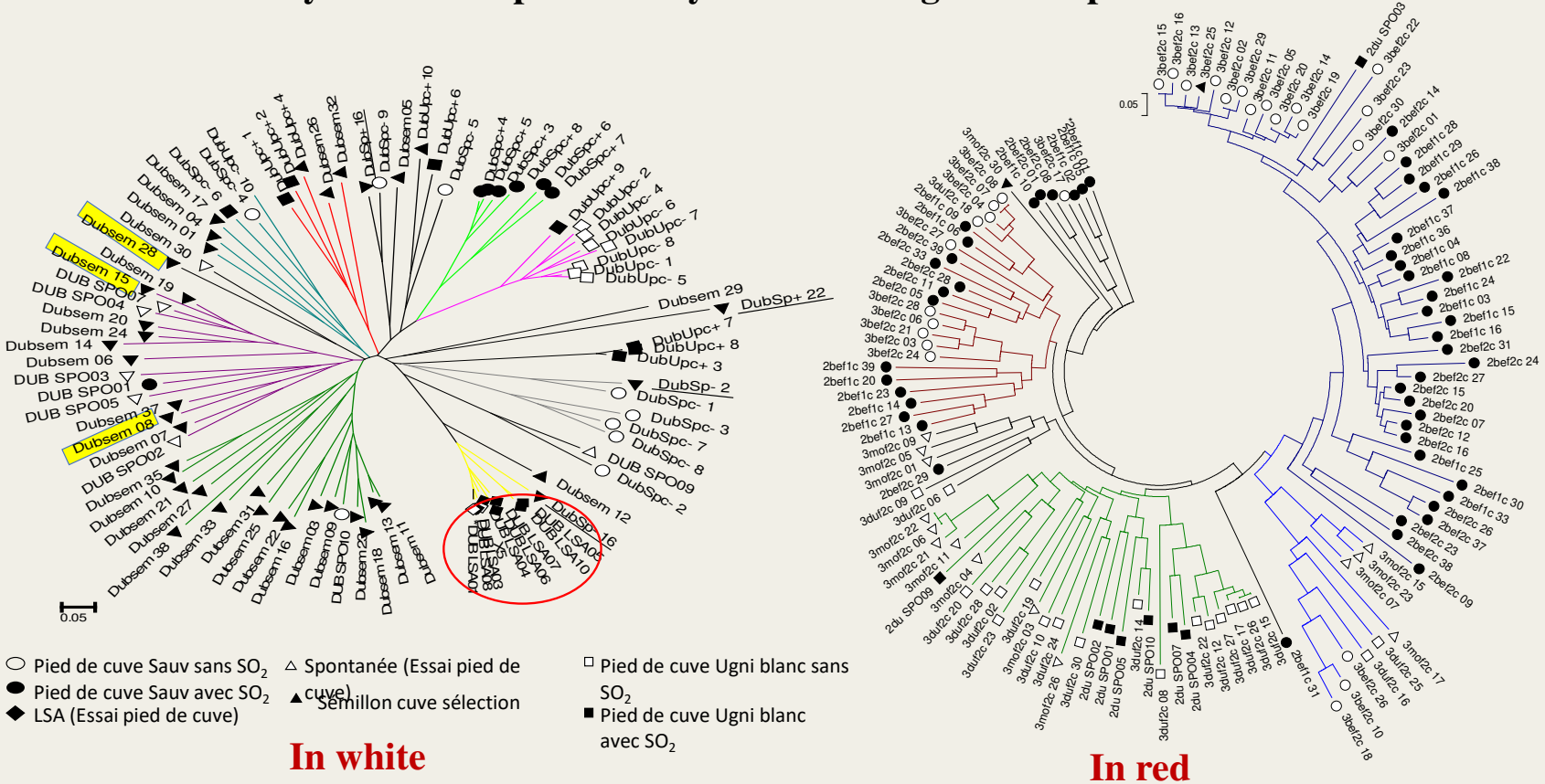
ACTION 1

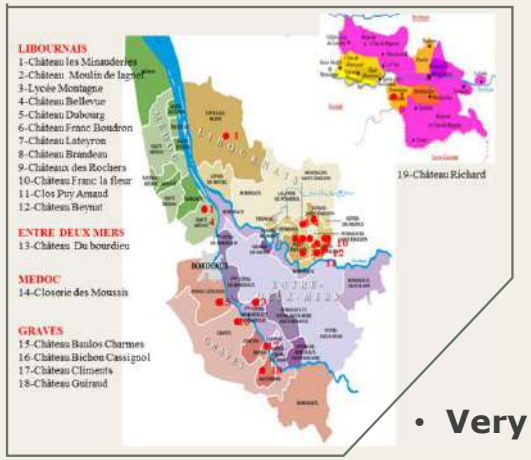
Genetic analysis and comparison of yeasts from regions and production sites:



Isabelle Masneuf

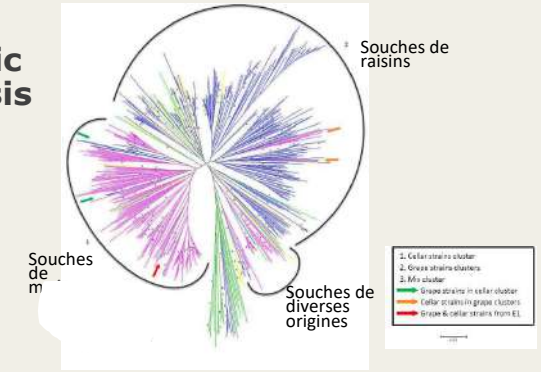
VIGNERONS BIO NOUVELLE AQUITAINE

Saccharomyces cerevisiae Research: Biodiversity study



- **Sampling**
  - New Aquitaine
  - 26 farms
  - 600 strains

- **Genetic analysis**
-



- **Very wide variety of strains (up 10,000)**
- **Separation of grape and chai populations**
- **No specific strain of region or estate**
- **But persistence of strains on several vintages in appellations and cellars**

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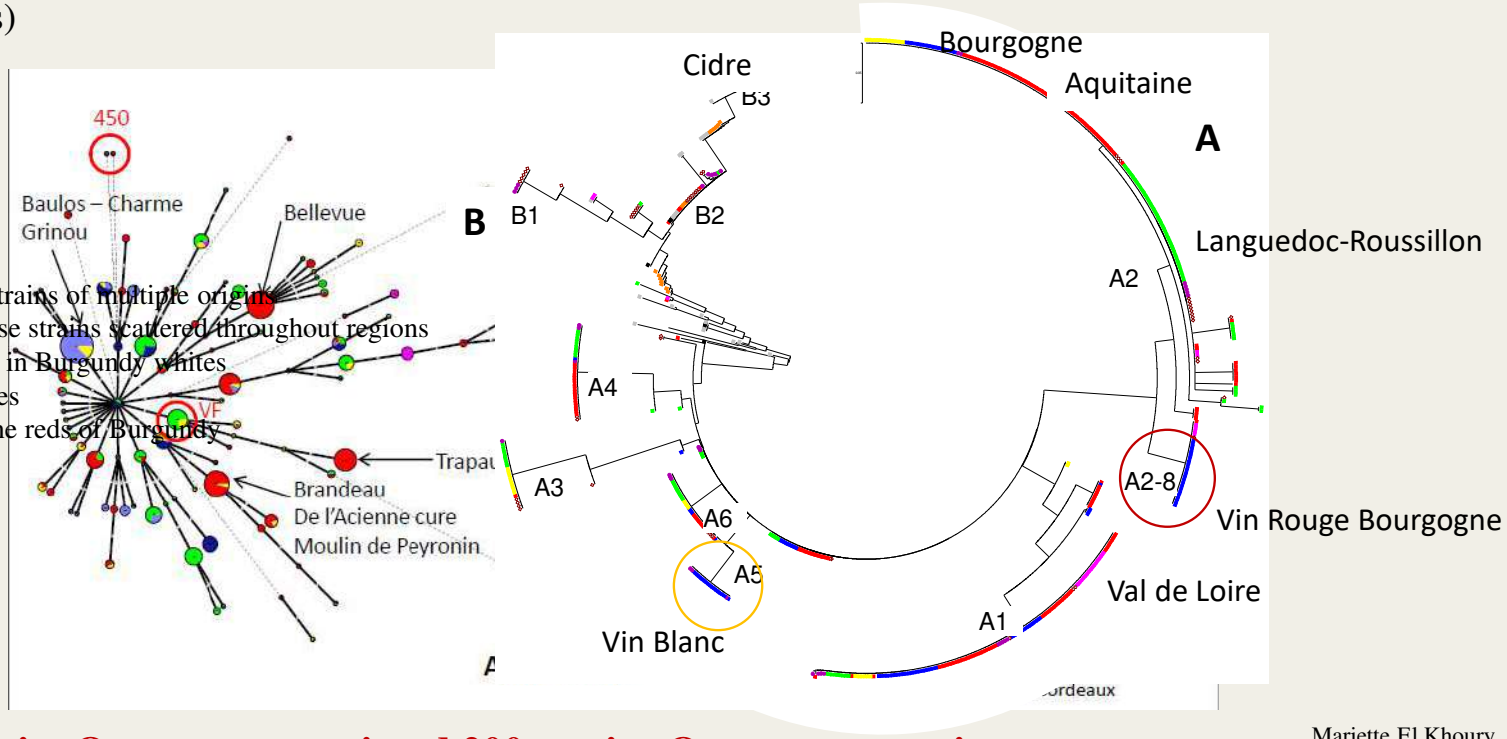
Genetic analysis and comparison of bacteria in regions and production sites

:

VNTR : Differentiates Oenococcus oeni strains

SNP : Genetic proximity of Oenococcus oeni strains (determine strains are specific, or not, of regions, farms or products)



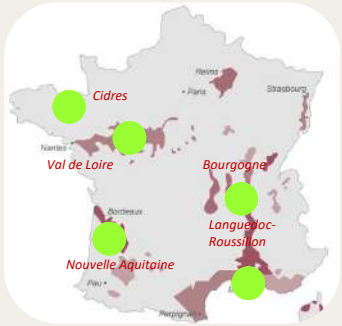
In a region of strains of multiple origins
Genetically close strains scattered throughout regions
Specific strains in Burgundy whites
and champagnes
And partly in the reds of Burgundy

1072 colonies Oenococcus oeni and 200 strains Oenococcus oeni

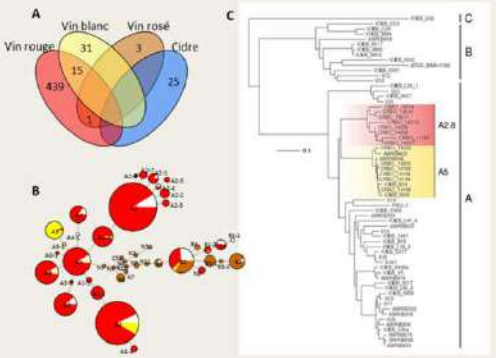
Mariette El Khoury
Patrick Lucas

VIGNERONS BIO NOUVELLE AQUITAINE

Oenococcus oeni Research: Biodiversity study



Genetic analysis



set of samples

5 regions

74 farms

235 wines and ciders

3000 bacteria

- **No regionally specific strains**
- **Nor exploitation**
- **But strains adapted to types of wines**
- **And strains persisting on farms**

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Conclusion

For each species, yeast strains and oenological bacteria:

- form a single genetic family (a single origin)
- their recent appearance and is related to human activity

- form genetic groups (sub-families) sometimes specific of products
- no specific groups of region (or exploitation), as they disperse
- no dominant strains, (no "invasion" of commercial strains)
- are very diverse (a few hundred or thousands of different strains per region)

- are rarely found in several regions
- without being "genetically specific" to a region, or a farm,
  they can sometimes appear "unique" to a region or exploitation (because they are very diverse)

Mariette El Khoury
Patrick Lucas

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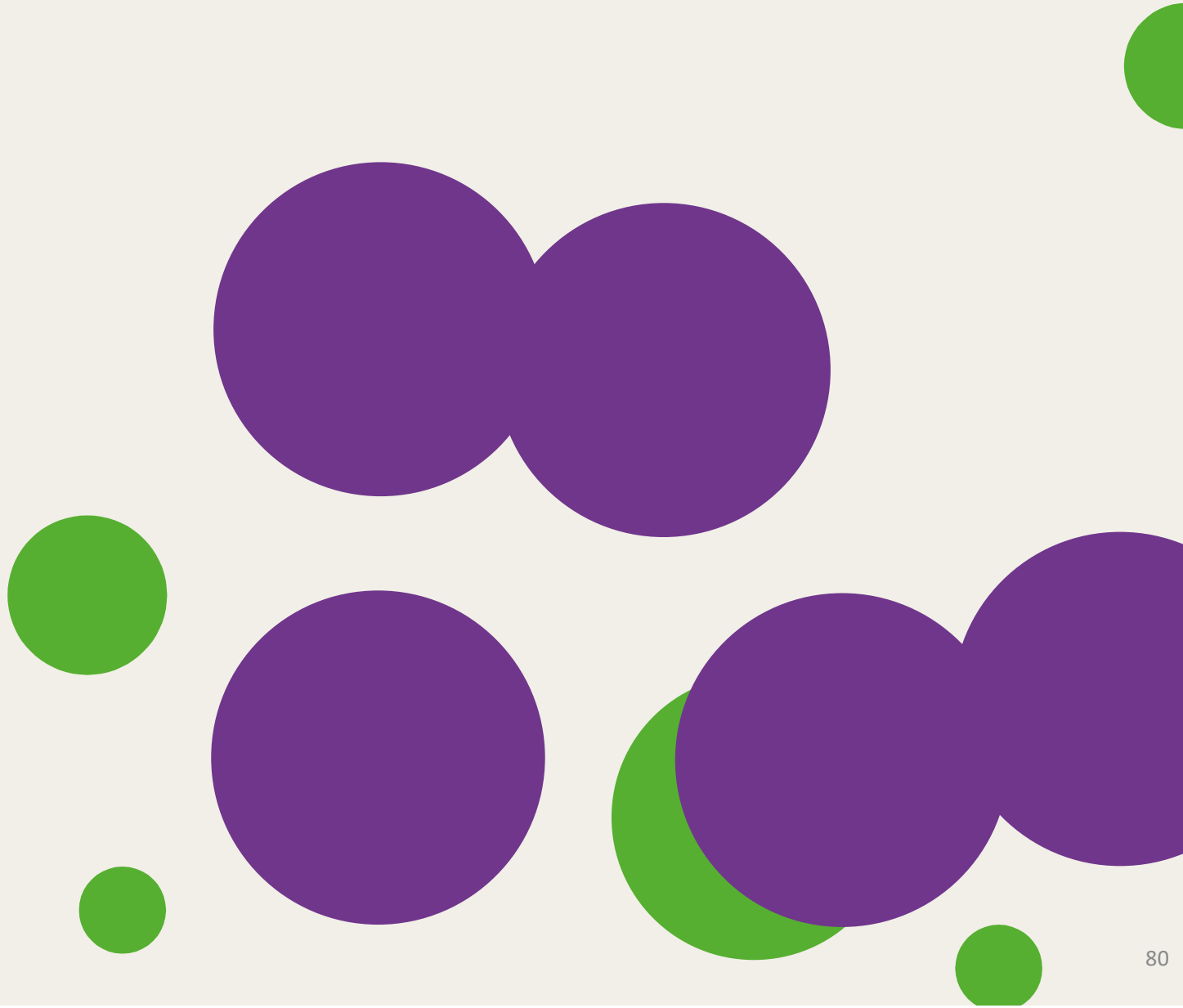
Starter for Yeast



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PDC

30L Or 50L

ISVV/IFV

Controlled environments

2012

PDC: Merlot
Harvest: Merlot
Modality: **-Liquid and Solid**
-With SO2 and Sans SO2
-LSA Bio
-Spontaneous

2013

PDC: Sauvignon Blanc
Harvest: Sauvignon Blanc
Modality: **-13C and 18C**
-With O2 and No O2
-LSA F33
-Spontaneous

PDC: Merlot
Harvest: Merlot
Modality: **-18C and 24C**
-With O2 and No O2
-LSA F33
-Spontaneous

2014

PDC: Sauvignon Blanc
Harvest: Sauvignon Blanc
Modality: **-T-18 degrees Celsius**
-With O2 Or Without O2
-LSA F33
-Spontaneous

PDC: Merlot
Harvest: Merlot
Modality: **-T-24degrees Celsius**
-With O2 and No O2
-LSA F33
-Spontaneous

2,5hL

Estate

Ground

2012

PDC: Ugni Blanc and Sauvignon blanc
Harvest: Sauvignon gris
Modality: **-With SO2 and Sans SO2**
-LSA Bio
-Spontaneous

2013

No ground test

2014

PDC: Sauvignon Blanc
Haverst: Sauvignon Blanc
Modality: **-LSA X5**
-PDC

PDC: Merlot
Harvest: Merlot
Modality: **-LSA F33**
-PDC

PDC: Merlot
Harvest: Merlot
Modality: **-Spontaneous**
-PDC

PDC: Merlot
Harvest: Merlot
Modality: **-Be15**
-Mixe

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Conclusion

- Solid/Liquid - No difference → Choice - Liquid because it's more convenient to manage
- Picking grapes with maturity, healthy and not too acidic
- SO2= No difference → But better control of microorganisms and promotes the development of Saccharomyces.cerevisiae
- Température → 18oC for whites
  24oC for the Reds
- O2 = No answer

PDC Protocol

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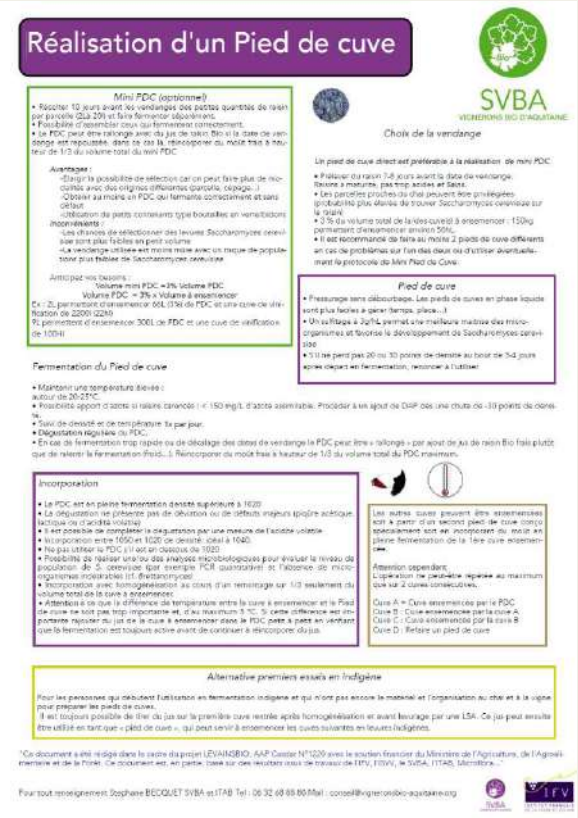
NOUVELLE AQUITAINE

Tools for winegrowers



Réalisation d'un Pied de cuve

SVBA
VIGNERONS BIO D'AQUITAINE

Mini PDC (optionnel)

• Récolter 10 jours avant les vendanges des petites quantités de raisin par parcelle (5à 20l) et faire fermenter séparément.
• Possibilité d'assembler ceux qui fermentent correctement.
• Le PDC peut être allongé avec du jus de raisin Bio si la date de vendange est repoussée, dans ce cas là, réincorporer du moût frais à hauteur de 1/3 du volume total du mini PDC

Avantages :
-Elargir la possibilité de sélection car on peut faire plus de micro-cuvées avec des origines différentes (parcelle, cépage...)
-Obtenir au moins un PDC qui fermente correctement et sans défaut
-Utilisation de petits contenants type bouteilles en verre/bidons

Inconvénients :
-Les chances de sélectionner des levures Saccharomyces cerevisiae sont plus faibles en petit volume
-La vendange utilisée est moins mûre avec un risque de population plus faibles de Saccharomyces cerevisiae

Anticipez vos besoins :
Volume mini PDC = 1% Volume PDC
Volume PDC = 3% x Volume à ensemencer
Ex : 2L permettent d'ensemencer 66L (3%) de PDC et une cuve de vinification de 2200 (22hl)
9L permettent d'ensemencer 300L de PDC et une cuve de vinification de 10Dhl

Choix de la vendange

Un pied de cuve direct est préférable à la réalisation de mini PDC
• Prélever du raisin 7-8 jours avant la date de vendange, baies à maturité, pas trop acides et sains.
• Les parcelles proches du chai peuvent être privilégiées (probabilité plus élevée de trouver Saccharomyces cerevisiae sur le raisin)
• 3 % du volume total de la (des cuve(s) à ensemencer : 150kg permettent d'ensemencer environ 50hL
• Il est recommandé de faire au moins 2 pieds de cuve différents en cas de problèmes sur l'un des deux ou d'utiliser éventuellement le protocole de Mini Pied de Cuve.

Pied de cuve
• Pressurage sans débourbage. Les pieds de cuves en phase liquide sont plus faciles à gérer (temps, place...)
• Un sulfitage à 3g/hL permet une meilleure maitrise des micro-organismes et favorise le développement de Saccharomyces cerevisiae
• Si on ne peut pas 20 ou 30 pointe de densité au bout de 5-6 jours après départ en fermentation, renoncer à l'utiliser.

Fermentation du Pied de cuve

• Maintenir une température élevée : autour de 20-25°C.
• Possibilité apport d'azote si raisins carencés : < 150 mg/L d'azote assimilable. Procéder à un ajout de DAP dès une chute de -30 points de densité.
• Suivi de densité et de température 1x par jour.
• Dégustation régulière du PDC.
• En cas de fermentation trop rapide ou de décalage des dates de vendange le PDC peut être « allongé » par ajout de jus de raisin Bio frais plutôt que de ralentir la fermentation (froid...). Réincorporer du moût frais à hauteur de 1/3 du volume total du PDC maximum.

Incorporation

• Le PDC est en pleine fermentation densité supérieure à 1020
• La dégustation ne présente pas de déviation ou de défauts majeurs (piqûre acétique, lactique ou d'acidité volatile)
• Il est possible de compléter la dégustation par une mesure de l'acidité volatile
• Incorporation entre 1050 et 1020 de densité, idéal à 1040.
• Ne pas utiliser le PDC s'il est en dessous de 1020
• Possibilité de réaliser une/ou des analyses microbiologiques pour évaluer le niveau de population de S. cerevisiae (par énergie PCR quantitative) et l'absence de micro-organismes indésirables (LT, Brettanomyces)
• Incorporation avec homogénéisation au cours d'un remontage sur 1/3 seulement du volume total de la cuve à ensemencer.
• Attention à ce que la différence de température entre la cuve à ensemencer et le Pied de cuve ne soit pas trop importante et, d'au maximum 5 °C. Si cette différence est importante rajouter du jus de la cuve à ensemencer dans le PDC avant à petit en vérifiant que la fermentation est toujours active avant de continuer à réincorporer du jus.

Les autres cuves peuvent être ensemencées soit à partir d'un second pied de cuve conçu spécialement soit en incorporant du moût en pleine fermentation de la 1ère cuve ensemencée.

Attention cependant :
L'opération ne peut être réalisée au maximum que sur 2 cuves consécutives.

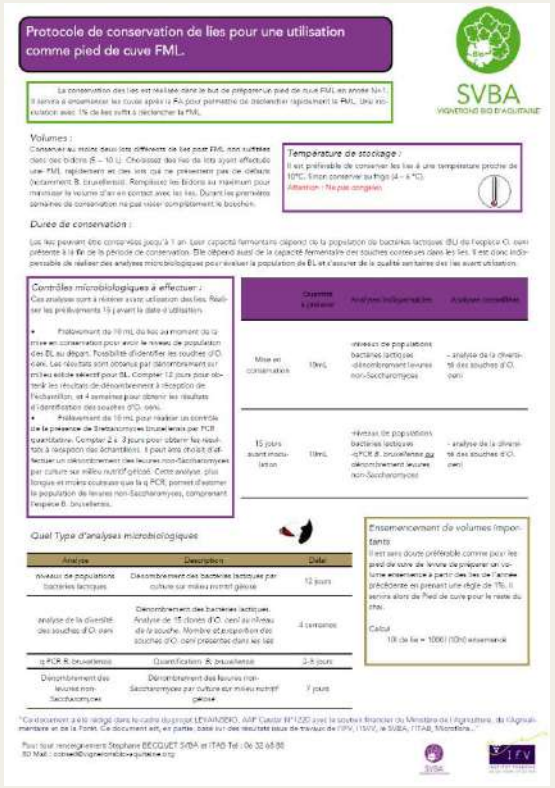
Cuve A = Cuve ensemencée par le PDC
Cuve B : Cuve ensemencée par la cuve A
Cuve C : Cuve ensemencée par la cuve B
Cuve D : Refaire un pied de cuve

Alternative premiers essais en indigène

Pour les personnes qui débutent l'utilisation en fermentation indigène et qui n'ont pas encore le matériel et l'organisation au chai et à la vigne pour préparer les pieds de cuves.
Il est toujours possible de tirer du jus sur la première cuve restrée après homogénéisation et avant levurage par une LSA. Ce jus peut ensuite être utilisé en tant que « pied de cuve », qui peut servir à ensemencer les cuves suivantes en levures indigènes.

*Ce document a été rédigé dans le cadre du projet LEVAINBIO, AAP Casdar N°1220 avec le soutien financier du Ministère de l'Agriculture, de l'Agroalimentaire et de la Forêt. Ce document est, en partie, basé sur des résultats issus de travaux de l'IFV, l'ISVV, le SVBA, l'ITAB, Microflora...

Pour tout renseignement Stephanie BECQUET SVBA et ITAB Tel : 06 32 68 88 88 Mail : conseil@vignerons-bio-aquitaine.org



Protocole de conservation de lies pour une utilisation comme pied de cuve FML.

SVBA
VIGNERONS BIO D'AQUITAINE

La conservation des lies est réalisée dans le but de préparer un pied de cuve FML en année N+1. Il servira à ensemencer les cuves après la FA pour permettre de déclencher rapidement la FML. Une inoculation avec 1% de lies suffit à déclencher la FML.

Volumes :
Conserver au moins deux lots différents de lies pour FML non suivies dans des bidons (5 – 10 L). Choisissez des lies de lots ayant effectués une FML rapidement et des lots qui ne présentent pas de défauts (notamment B. bruxellensis). Remplissez les bidons au maximum pour maintenir le volume d'air en contact avec les lies. Durant les premières semaines de conservation ne pas visser complètement le bouchon.

Température de stockage :
Il est préférable de conserver les lies à une température proche de 10°C. Eviter conserver au froid (4 – 5 °C).
Attention : Ne pas congeler.

Durée de conservation :
Les lies peuvent être conservées jusqu'à 1 an. Leur capacité fermentaire dépend de la population de bactéries lactiques (BL) du l'espèce O. oeni présente à la fin de la période de conservation. Elle dépend aussi de la capacité fermentaire des souches contenues dans les lies. Il est donc indispensable de réaliser des analyses microbiologiques pour évaluer la population de BL et s'assurer de la qualité sanitaire des lies avant utilisation.

Contrôles microbiologiques à effectuer :
Ces analyses sont à réaliser avant utilisation des lies. Réaliser les prélèvements 15 j avant la date d'utilisation.

• Prélèvement de 10 mL du lies au moment de la mise en conservation pour avoir le niveau de population des BL au départ. Possibilité d'identifier les souches d'O. oeni. Les résultats sont obtenus par dénombrement sur milieu solide sélectif pour BL. Compter 12 jours pour obtenir les résultats de dénombrement à réception de l'échantillon, et 4 semaines pour obtenir les résultats d'identification des souches d'O. oeni.
• Prélèvement de 10 mL pour réaliser un contrôle de la présence de Brettanomyces bruxellensis par PCR quantitative. Compter 2 à 3 jours pour obtenir les résultats à réception des échantillons. Il peut être choisi d'effectuer un dénombrement des levures non-Saccharomyces par culture sur milieu nutritif sélectif. Cette analyse plus longue et moins couteuse que la q PCR, permet d'estimer la population de levures non-Saccharomyces, comprenant l'espèce B. bruxellensis.

	Quantité à prélever	Analyses indispensables	Analyses conseillées
Mise en conservation	10mL	-niveaux de populations bactéries lactiques -dénombrement levures non-Saccharomyces	- analyse de la diversité des souches d'O. oeni
15 jours avant inoculation	10mL	-niveaux de populations bactéries lactiques -qPCR B. bruxellensis ou dénombrement levures non-Saccharomyces	- analyse de la diversité des souches d'O. oeni

Quel Type d'analyses microbiologiques

Analyse	Description	Délai
niveaux de populations bactéries lactiques	Dénombrement des bactéries lactiques par culture sur milieu nutritif gélosé	12 jours
analyse de la diversité des souches d'O. oeni	Dénombrement des bactéries lactiques. Analyse de 15 clones d'O. oeni au niveau de la souche. Nombre et caractérisation des souches d'O. oeni présentes dans les lies	4 semaines
q PCR B. bruxellensis	Quantification B. bruxellensis	2-3 jours
Dénombrement des levures non-Saccharomyces	Dénombrement des levures non-Saccharomyces par culture sur milieu nutritif gélosé	7 jours

Ensemencement de volumes importants
Il est sans doute préférable comme pour les pied de cuve de tenter de préparer un volume ensemencé à partir des lies de l'année précédente en prenant une règle de 1%. Il seront alors de Pied de cuve pour le reste du chai.

Calcul
10l de lie = 1000 l (100 hl) ensemencé

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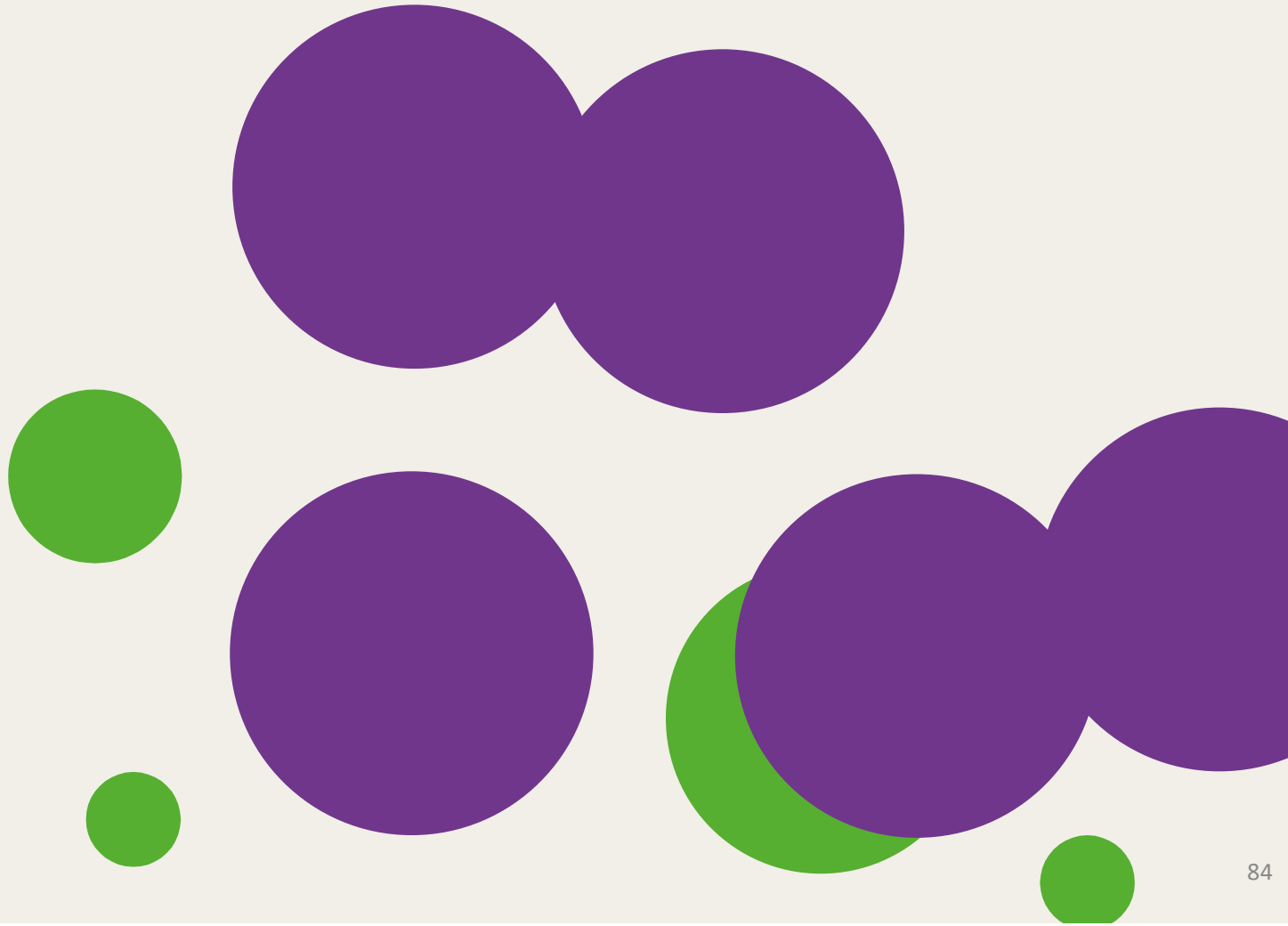
Starter for Bacteria



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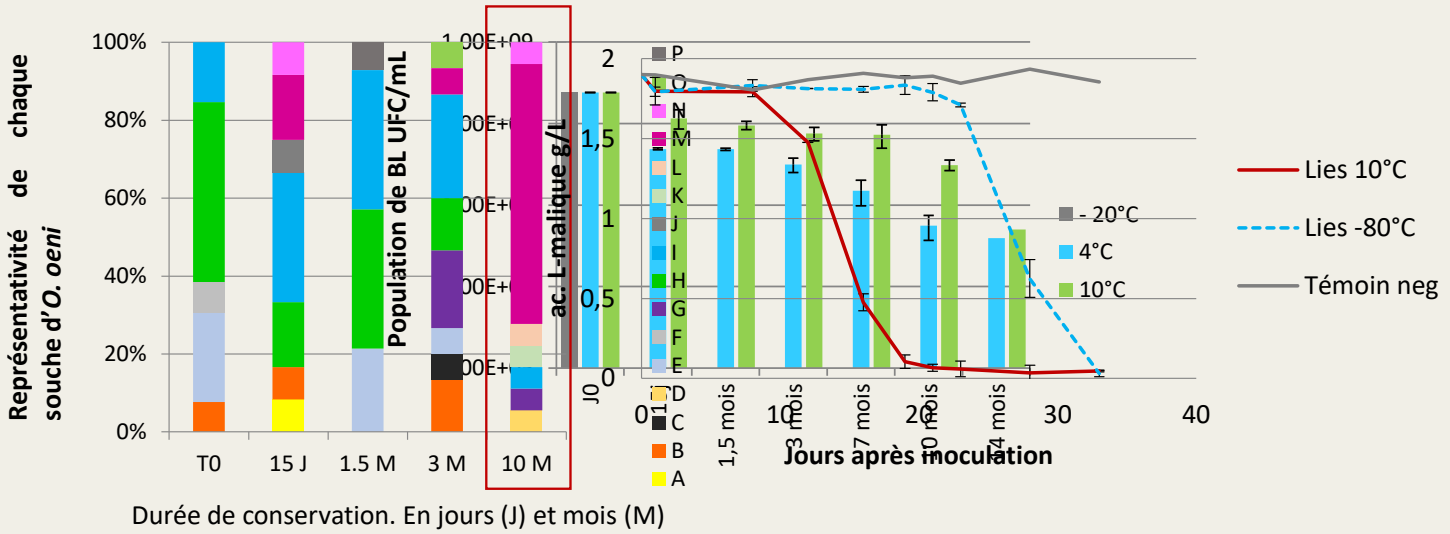
Develop FML tank foot preparation and control protocols

Conservation of lees

- Gradual disappearance of majority strains during conservation
- Detection of new strains

Keep the lees to use as PDC in year N+1

-Better survival of bacteria on lees at 10oC



Durée de conservation. En jours (J) et mois (M)

Mariette El Khoury

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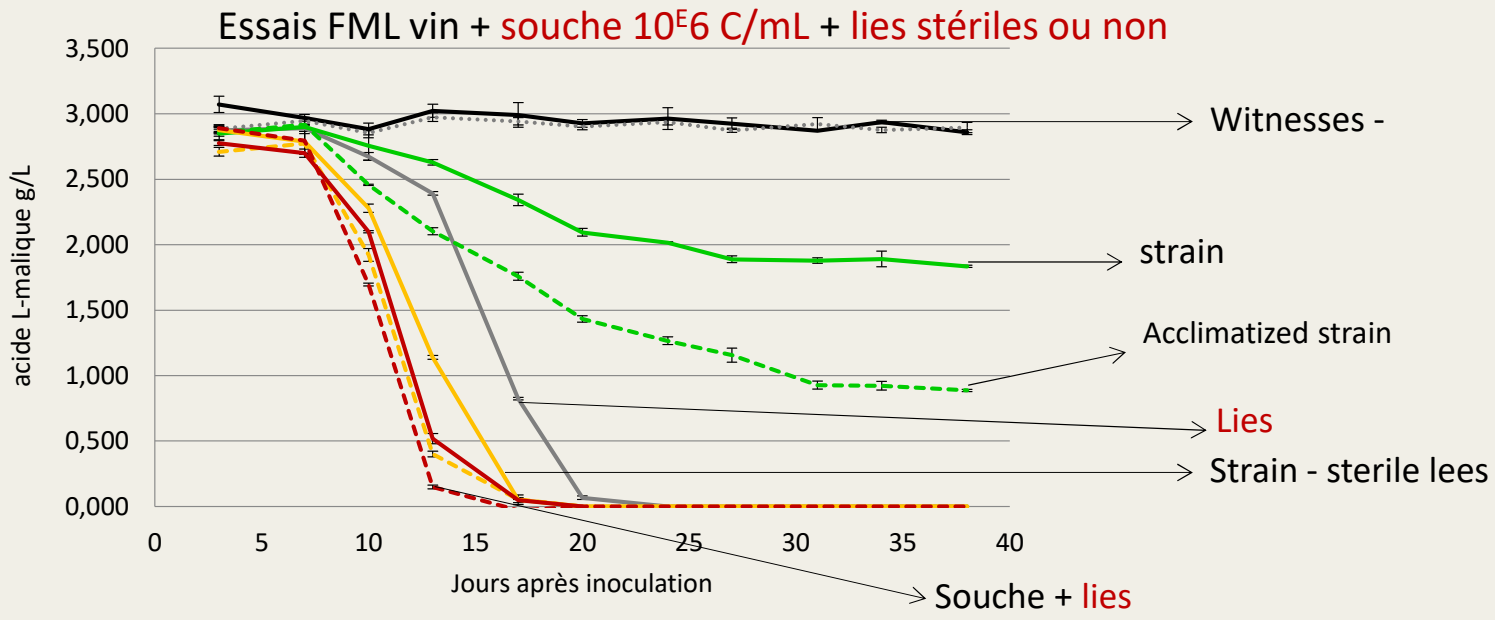
Relevance of FML's lees



*FML only bad strain probably because of wine
*Strain - lees (sterile or not): FML - 15 days

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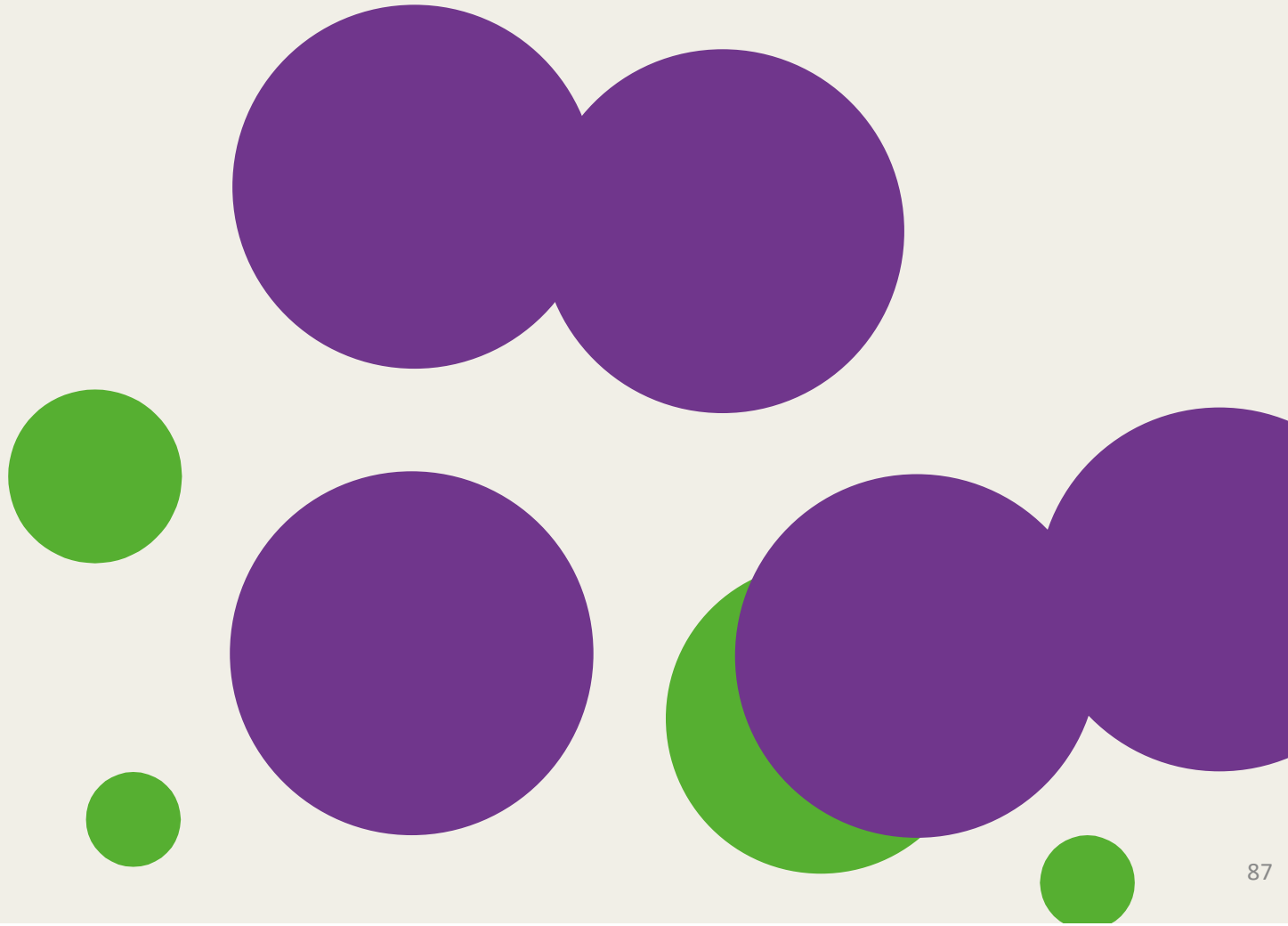
Selection



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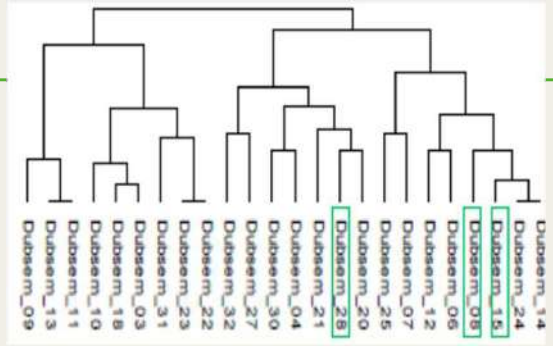
SELECTION



STRAIN/CHATEAUX

Synthetic Must Preselection
-Fermentary Kinetics
-Chemical analysis

ISVV

Natural Must selection
-Fermentary Kinetics
-Chemical analysis
-H2S test for yeasts
-Biogenic amines test for bacteria

IFV

Production of cream to test the strain in vats at the IFV

Châteaux

Production of cream to test the strain at the property

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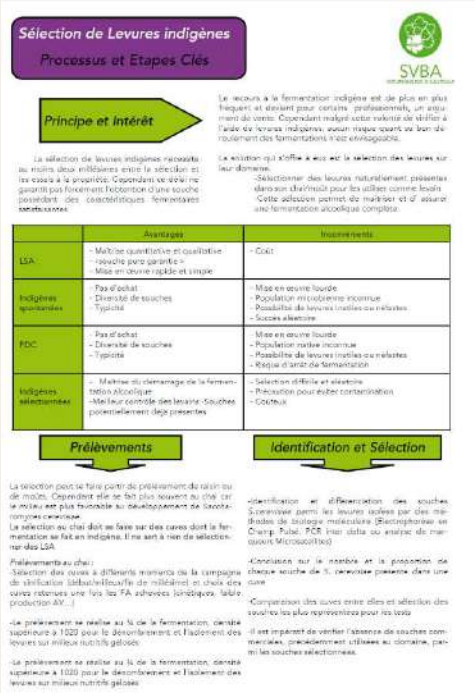
Tools for winegrowers



Sélection de Levures indigènes

Processus et Etapes Clés

SVBA

Principe et intérêt

Le recours à la fermentation indigène est de plus en plus fréquent et devient pour certains professionnels, un argument de vente. Cependant malgré cette volonté de vérifier à l'aide de levures indigènes, aucun risque quant au bon déroulement des fermentations n'est envisageable.

La sélection de levures indigènes nécessite au moins deux millésimes avant la sélection et les essais à la propriété. Cependant ce délai ne garantit pas forcément l'obtention d'une souche possédant des caractéristiques fermentaires satisfaisantes.

La solution qui s'offre à eux est la sélection des levures sur leur domaine.

-Sélectionner des levures naturellement présentes dans son chai/mût pour les utiliser comme levain

-Cette sélection permet de maîtriser et d' assurer une fermentation alcoolique complète

	Avantages	Inconvénients
LSA	- Maîtrise quantitative et qualitative - «souche pure garantie » - Mise en œuvre rapide et simple	- Coût
Indigènes spontanées	- Pas d'achat - Diversité de souches - Typicité	- Mise en œuvre lourde - Population mi croissante incontrôlée - Possibilité de levures inutiles ou nuisibles - Succès aléatoire
PDC	- Pas d'achat - Diversité de souches - Typicité	- Mise en œuvre lourde - Population native incontrôlée - Possibilité de levures inutiles ou nuisibles - Risque d'arrêt de fermentation
Indigènes sélectionnées	- Maîtrise du démarrage de la fermentation alcoolique -Meilleur contrôle des levains -Souches potentiellement déjà présentes	- Sélection difficile et aléatoire - Précaution pour éviter contamination - Coûteux

Prélèvements

La sélection peut se faire partir de prélèvement de raisin ou de moûts. Cependant elle se fait plus souvent au chai car le milieu est plus favorable au développement de Saccharomyces cerevisiae.

La sélection au chai doit se faire sur des cuves dont la fermentation se fait en indigène. Il ne sert à rien de sélectionner des LSA

Prélèvements au chai:

-Sélection des cuves à différents moments de la campagne de vinification (début/milieu/fin de millésime) et choix des cuves retenues une fois les FA achevées (cinétiques, taille, production AV...)

-Le prélèvement se réalise au ¼ de la fermentation, densité supérieure à 1020 pour le dénombrement et l'isolement des levures sur milieux nutritifs gélosés

-Le prélèvement se réalise au ¾ de la fermentation, densité supérieure à 1020 pour le dénombrement et l'isolement des levures sur milieux nutritifs gélosés

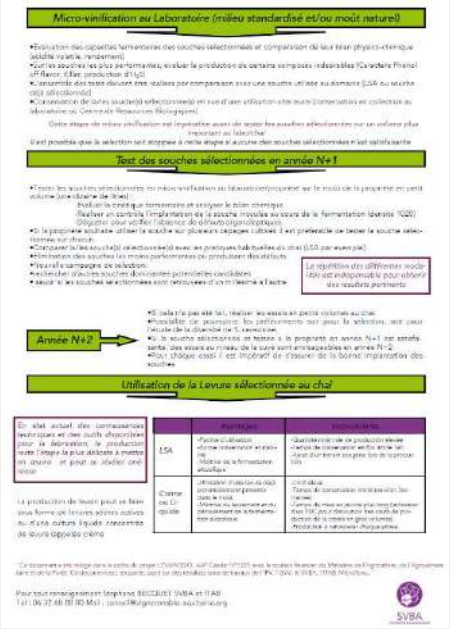
Identification et Sélection

-Identification et différenciation des souches S.cerevisiae permis les levures isolées par des méthodes de biologie moléculaire (Electrophorèse en Champ Pulsé, PCR inter delta ou analyse de marqueurs Microsatellites)

-Conclusion sur la viabilité et la prédiction de chaque souche de S. cerevisiae présente dans une cuve

-Comparaison des cuves entre elles et sélection des souches les plus représentées pour les tests

Il est important de vérifier l'absence de souches commerciales, précédemment utilisées au domaine, parmi les souches sélectionnées.



Micro-vinification au Laboratoire (milieu standardisé et/ou moût naturel)

•Evaluation des capacités fermentaires des souches sélectionnées et comparaison de leur bilan physico-chimique (acidité volatile, rendement)

•Parmi souches les plus performantes, évaluer la production de certains composés indésirables (Caractère Phénol off flavor, d'Est, production d'H2S)

•Comparatif des tests doivent être réalisés par comparaison avec une souche utilisé au domaine (LSA ou souche déjà sélectionnée)

•Conservation de cette souche(s) sélectionnée(s) en vue d'une utilisation ultérieure (conservation en collection au laboratoire ou Centre de Ressources Biologiques)

Cette étape de micro-vinification est importante avant de tester les souches sélectionnées sur un volume plus important au chai/cuve

Il est possible que la sélection soit stoppée à cette étape si aucune des souches sélectionnées n'est satisfaisante

Test des souches sélectionnées en année N+1

•Tester les souches sélectionnées en micro-vinification au laboratoire/propriété sur le moût de la propriété en petit volume (une cuve de 30 hl) :

-Analyser la cinétique fermentaire et analyser le bilan chimique

-Réaliser un contrôle l'implantation de la souche inoculée au cours de la fermentation (environ 1020) (Objectif : pour vérifier l'absence de refroidissement)

•Si la propriété souhaite utiliser la souche sur plusieurs cépages / cuves : il est préférable de tester la souche sélectionnée sur chacun.

•Comparer la(les souche(s) sélectionnée(s) avec les pratiques habituelles du chai (LSA par exemple)

•Elimination des souches les moins performantes ou produisant des défauts

•Vinification campagne de sélection

•Rechercher d'autres souches d'intérêts potentielles candidates

•Associer les souches sélectionnées sont retrouvées d'un millésime à l'autre

La répétition des différentes modalités est indispensable pour obtenir des résultats pertinents

Année N+2

•Si cela n'a pas été fait, réaliser les essais en petits volumes au chai

•Possibilité de poursuivre les refroidissements sur deux la sélection, sert pour l'étude de la diversité de S. cerevisiae.

•Si la souche sélectionnée se montre à la propriété en année N+1 est satisfaisante, des essais au niveau de la cave sont envisageables en année N+2

•Pour chaque essai il est important de s'assurer de la bonne implantation des souches

Utilisation de la Levure sélectionnée au chai

En état actuel des connaissances techniques et des outils disponibles pour la fabrication, la production reste l'étape la plus délicate à mettre en œuvre et peut se révéler onéreuse

	Avantages	Inconvénients
LSA	•Facilité d'utilisation •Bonne conservation en stabilité •Maîtrise de la fermentation alcoolique	•Quantité limitée de production (exemple de conservation en 5 ans au lieu 1an) •Aout d'un levain propre lors de supercuvaison
Crème ou Liquide	•Utilisation d'inoculum au chai, conservation garantie dans le moût •Maîtrise du lancement et du déroulement de la fermentation alcoolique	•Difficulté •Temps de conservation limité (environ 3 mois) •Certains du mise en œuvre plus long (entre 6 et 10h) pour réhydrater les sacs de production de la crème en gros volumes) •Production à renouveler chaque année

La production de levain peut se faire sous forme de levures sèches actives ou d'une culture liquide concentrée de levure appelée crème

Pour tout renseignement Stéphane BECQUET SVBA et ITAB

Tél : 06 32 68 81 80 Mail : conseil@vignerons-bio-aquitaine.org

SVBA

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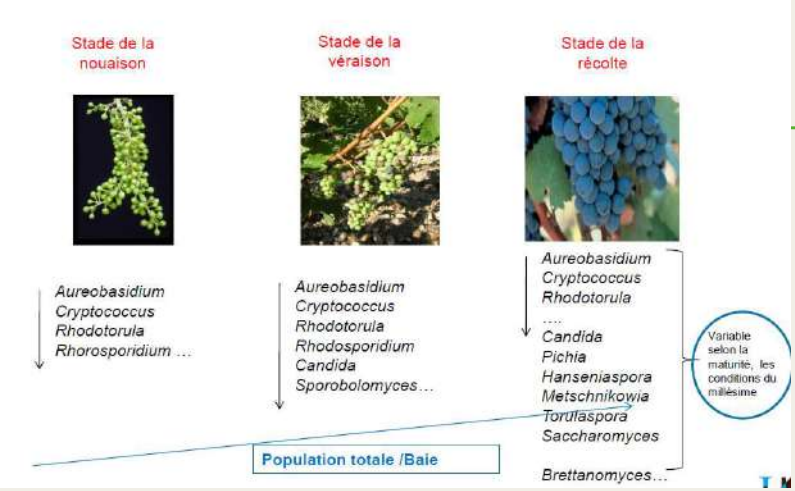
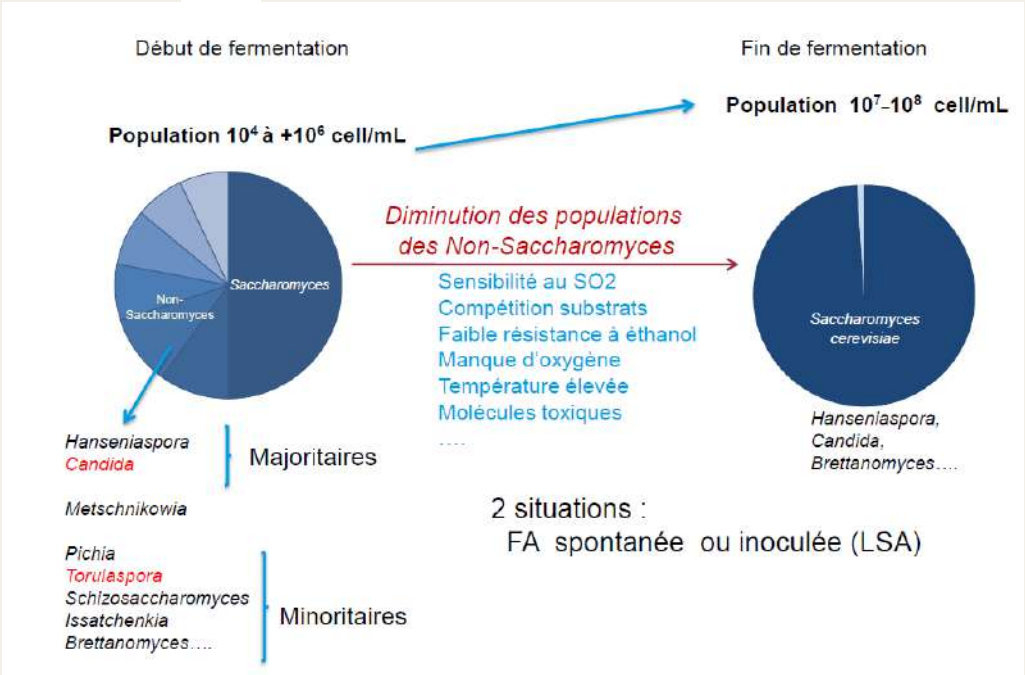
WILDWINE



Evolution fungal community on cluster

Evolution of yeast population during Alcoholic fermentation

There is little tool at the time to discriminate against strains of the same species:
Methods that are difficult to implement, not very reproducible
No methods available to analyze genetic relationships in NS
Development of molecular markers for NS: The example of Torulaspora delbrueckii
Genome sequence available (Gordon et al, 2009)
Development of 8 microsatellite markers on 6/8 chromosomes
Application to a collection of strains from around the world and various substrates



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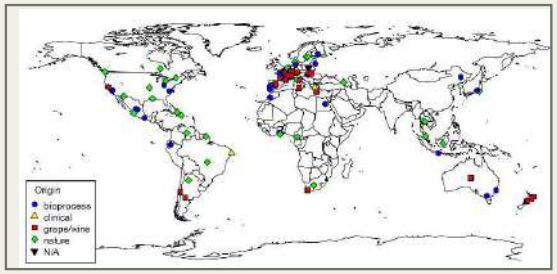
Non-Saccharomyces Yeasts Research: Biodiversity study

- *Torulaspora delbrueckii*
- *Hanseniaspora uvarum*
- *Metschnikovia pulcherima*
- *Candida zemplinina …*



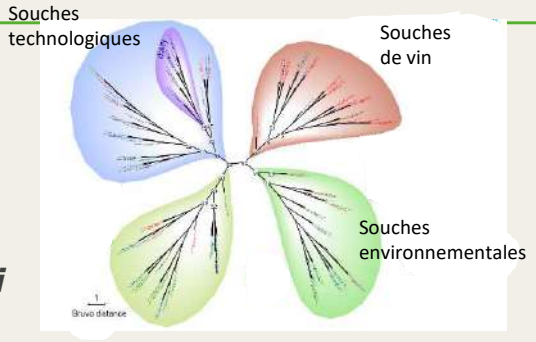
set of samples

-Depending on the species

-Global, regional, farms

Genetic diversity

T. delbrueckii



Grouping according to human activities
'Oenological' group - 1900years

Technology properties

-Fermentary performance below S.cerevisiae slow FA and incomplete

-T. delbrueckii: No AV production, H2S: interesting application for the production of sweet wines

-Organoleptic potential

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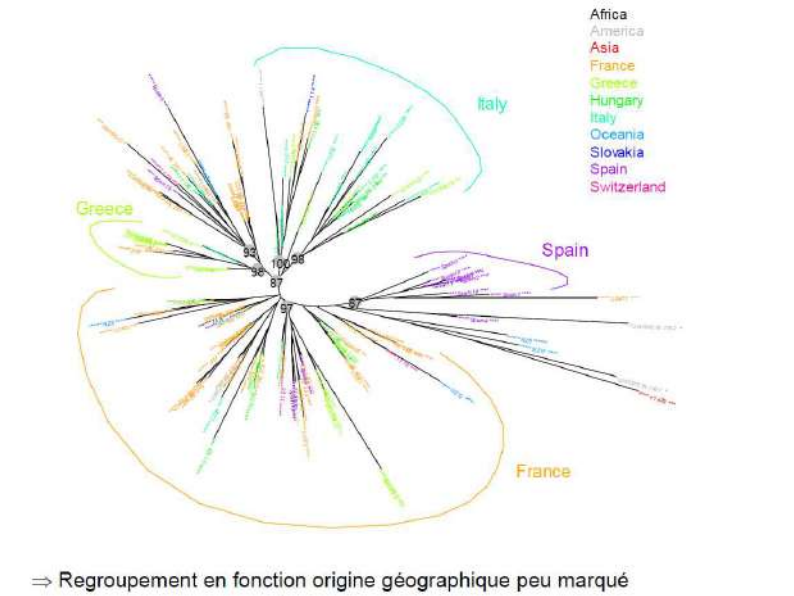
Candida Zemplinina



* No substrate grouping
* Grouping by low geographical origin
* No 'genetic' signature of the winery

Technology properties

-Fermentary performance below S.cerevisiae Slow FA and incomplete

-Production of unwanted metabolites (AV , H2S....)

-Low ethanol/sugar yield

-Fructophilia

-No industrial application possible

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protocol

Saint Emillion | **Sauternes**

« Natural culture»

5.10^5 cell/ml *S.cerevisiae* 5.10^5 cell/ml

T=0

- 3.10^5 cell/ml *Hanseniaspora uvarum* — 2.10^5 cell/ml
- 10^5 cell/ml *Candida zemplinina* — 2.10^5 cell/ml
- 10^4 cell/ml *Metschnikovia pullcherima* — 10^4 cell/ml
- 10^4 cell/ml *Torulaspora delbruekii* — 10^4 cell/ml

→ T=0

« Technological culture»

T=0

- 5.10^5 cell/ml *S.cerevisiae* 5.10^5 cell/ml after 24 h
- Same blend but without *H.uvarum* and *C.zemplinina* — Non-Saccharomyces — only *T.delbrueckii* at 10^7 cell/ml , t=0

« Pure culture»

2.10^6 cell/ml *S.cerevisiae (Industrial and selected)* 2.10^6 cell/ml

Protocols

	AT IFV mircovinification	Estate	
	The different modalities		
Château Bellevue	Sc F33 Sc Be15 Sc Be15 + *Torulaspora delbrueckii/ Metschnikowia pulcherrima*	« pied de cuve » /Spontaneous Fermentation Sc Be15 SC Be15 + *Torulaspora delbrueckii/ Metschnikowia pulcherrima*	
Château Guiraud	Sc ST Sc ST + Td « Alpha » Sc 86 Sc 86 + Td 63	Indegenious fermentation Sc ST Sc43 Sc86	ST Sc ST+ Td Alpha Sc86 Sc86 + Td 63

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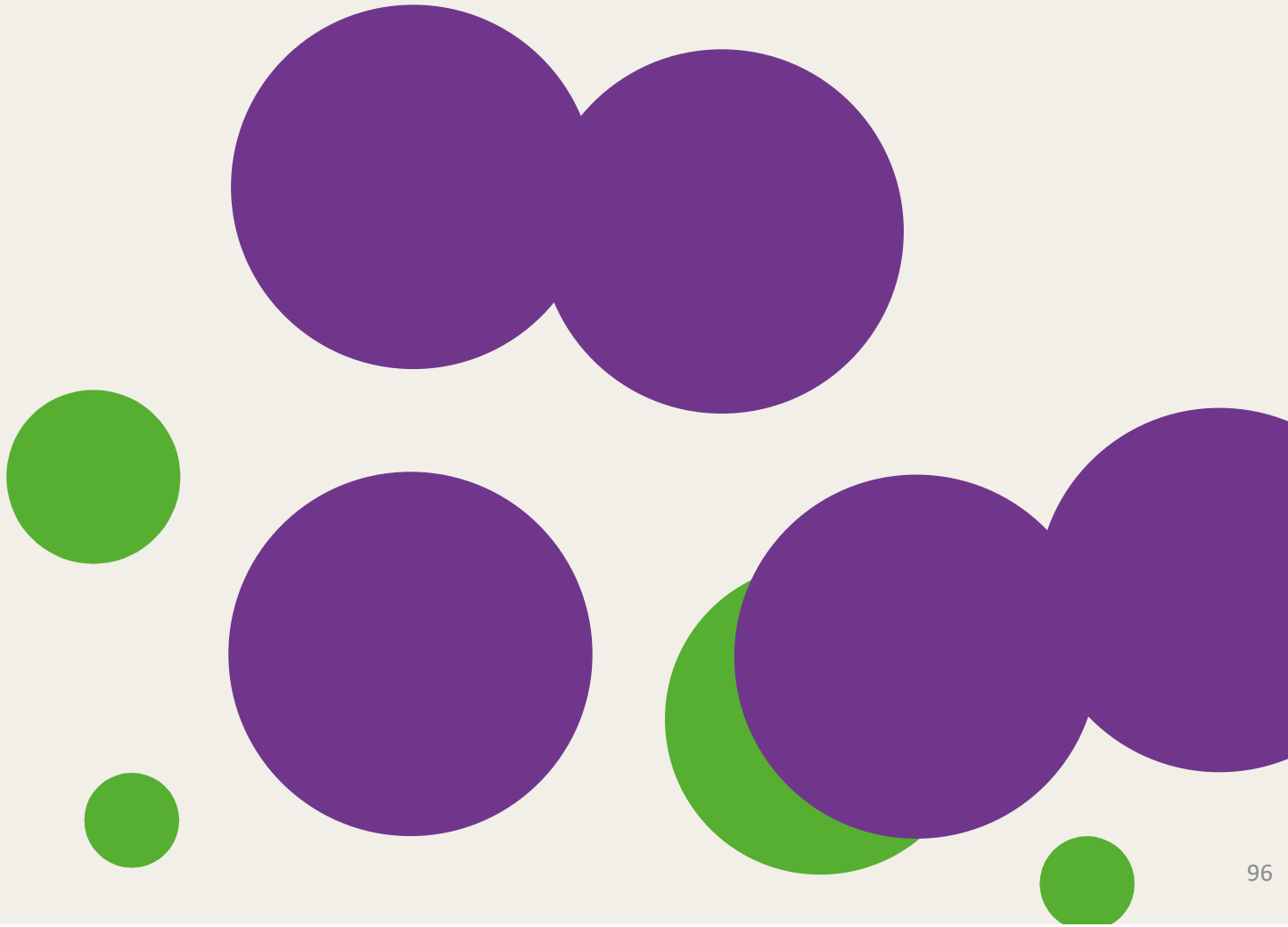
Saint-Emillion



Château Bellevue

Merlot

Terms:
Spontaneous fermentation with « Pied De Cuve" x 2
S.cerevisiae selected Be 15 x2
S.cerevisiae selected Be 15 - Torulaspora delbrueckii/ Metschnikowia pulcherrima selected x2

- Harvest by hand
- Vinification 2 hl vat
- Temperature control (20-22 degrees Celsius to D-1000 and then 25 degrees Celsius).
-

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Nature de l'analyse	Modalités					
	PDC 1	PDC 2	Be 15 (1)	Be 15 (2)	Mix 1	Mix 2
TAV %vol	13	12.95	12.80	12.95	13.00	12.85
Acidité totale g/L H_2SO_4	4.2	4.2	4.8	4.8	4.8	4.8
Acidité volatile g/L H_2SO_4 (1)	0.27	0.26	0.24	0.23	0.24	0.24
pH	3.37	3.38	3.29	3.31	3.30	3.31
Glycérol (g/L)	7.8	7.60	7.20	7.40	7.20	7.00

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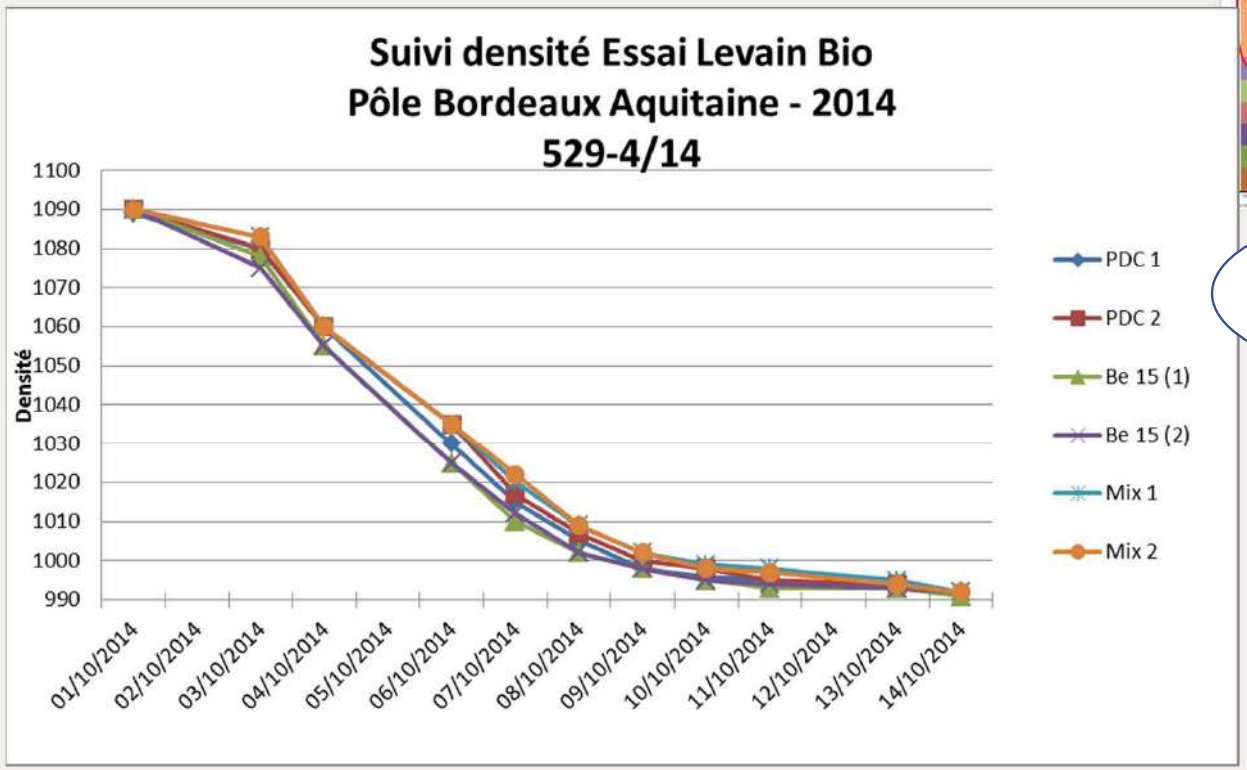
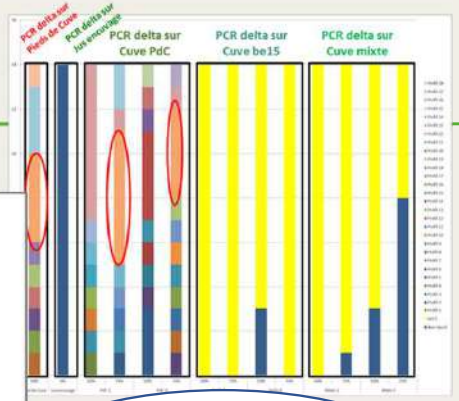
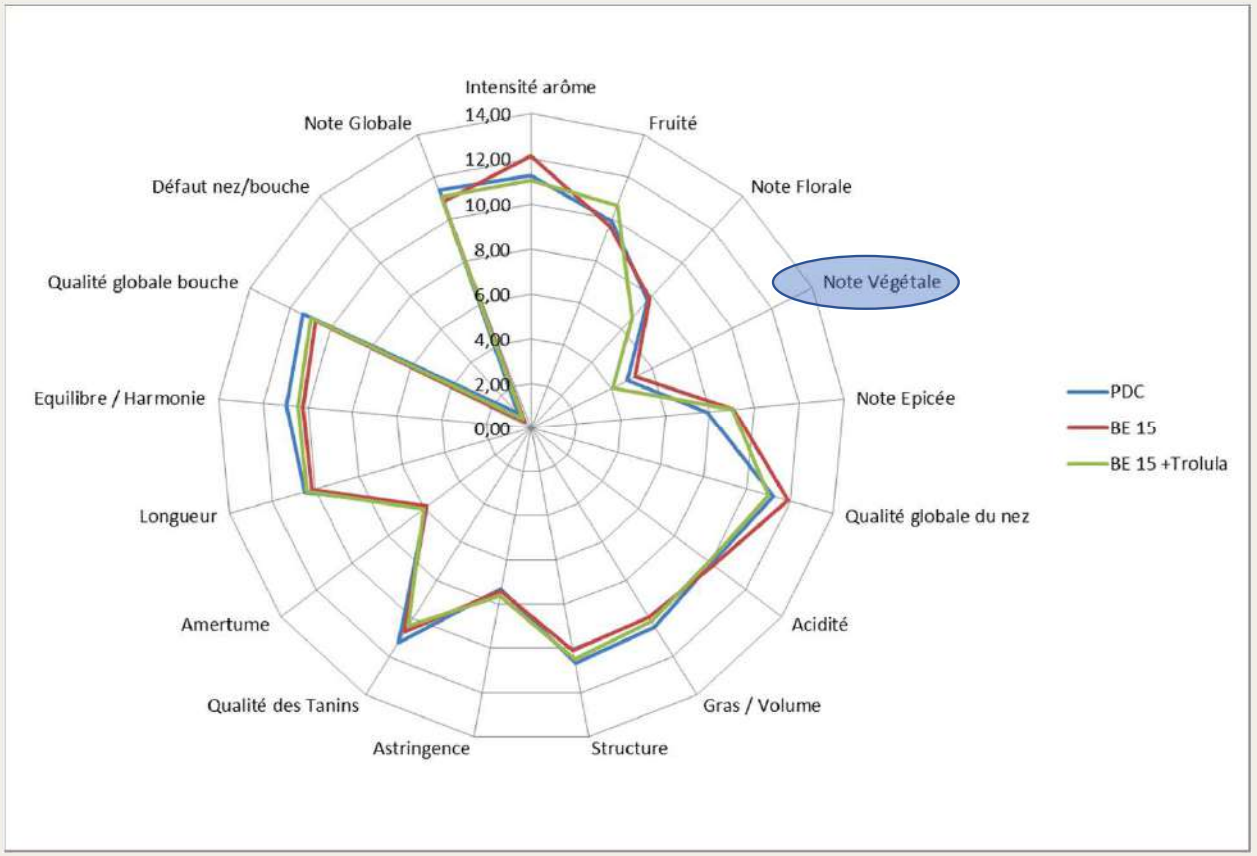




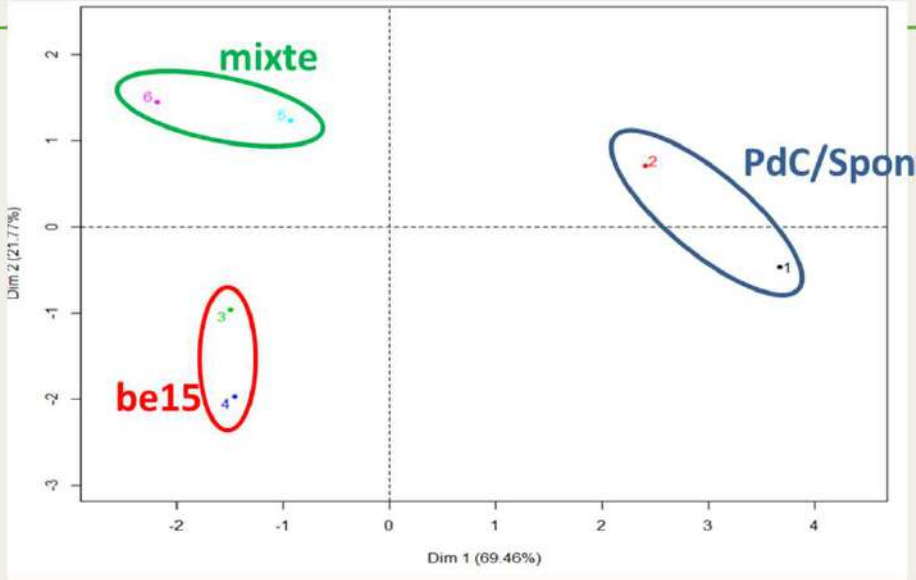
Implementation of Positive S.cerevisiae

Tasting: IFV (professional tasters)

	PDC	BE 15	BE 15 +Trolula
Vegetal Aromas	4,78	5,17	4,06



Esters analysis



Test de Kruskal-Wallis							
	2-phényléthanol	Acétate d'isoamyle	Acétate de 2-phényléthyl	Décanoate déthyle	Hexanoate déthyle	Octanoate déthyle	Butanoate déthyle
PdC vs be15	>	>	>	NS	NS	NS	NS
PdC vs mixte	>	NS	>	NS	<	NS	NS
Be15 vs mixte	NS	<	NS	NS	NS	NS	NS

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Tasting at the Paris Agriculture Show

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Aquitaine H ☐ F ☐ Votre âge :

Blanc Sémillon

Modalités	Echelle de plaisir	Descripteurs (2/3 mots)
035		
036		

Même questionnaire

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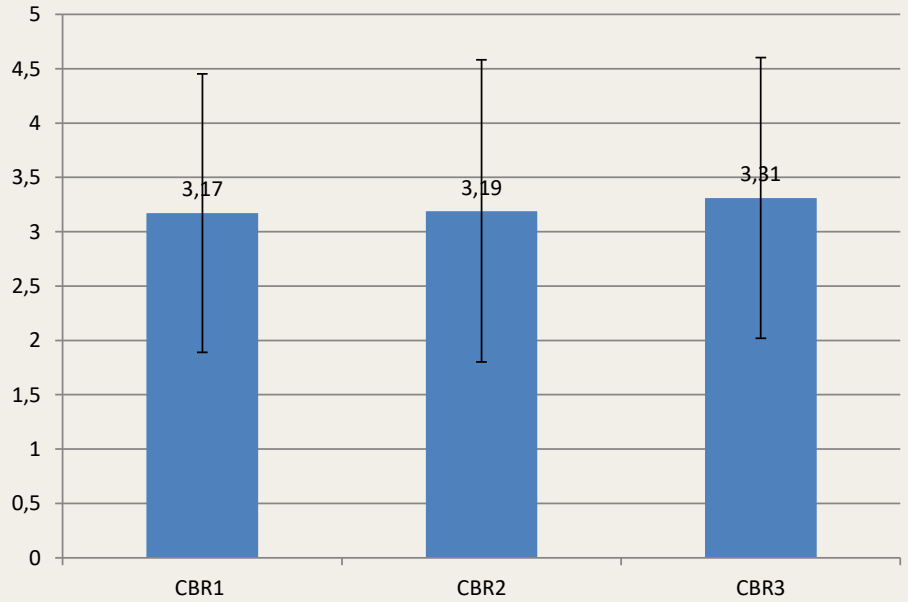
NOUVELLE AQUITAINE

Château Bellevue Rouge modality IFV SALON DE L'AGRICULTURE
No significant differences.

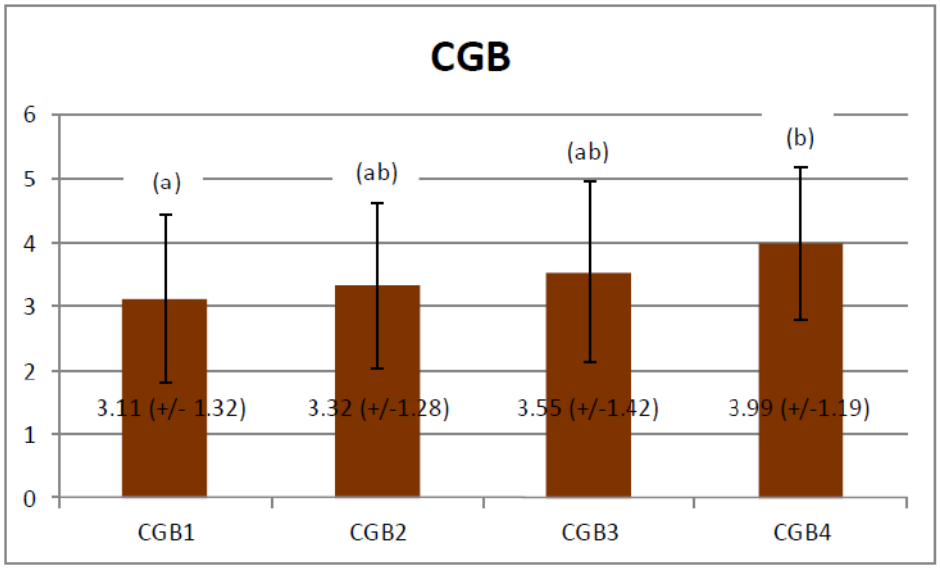
Average :
CBR1 = 3.17 (+/-1.28)
CBR2= 3.19 (+/- 1.39)
CBR3= 3.31 (+/- 1.29)
CBR1: LSA F33
CBR2: Souche Be 15
CBR3: Souche Be 15+ Torulaspora



VIGNERONS BIO
NOUVELLE AQUITAINE

Tasting of ifv modalities at Château Guiraud

CGB 1 : LSA ST
CGB 2 : LSA ST+ *Torulaspora*
CGB 3 : Select Yeast (Sc 86)
CGB 4 : Select Yeast (Sc 86) + Torulaspora



The analysis shows a significant difference between modality with a preference for CGB4

Thanks for your attention

VIGNERONS BIO
NOUVELLE AQUITAINE

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MINISTÈRE DE L'AGRICULTURE ET DE L'ALIMENTATION

RÉGION Nouvelle-Aquitaine

Gironde LE DÉPARTEMENT

AGENCE DE L'EAU ADOUR-GARONNE