LAMOTHE-ABIET

Sparkling wine brochure

This practical booklet is designed to accompany you throughout the preparation and creation of your sparkling wines. The format of the booklet follows the standard protocol for sparkling wine production, for different method production.

2021

There are different methods of producing sparkling wine. Lamothe-Abiet team is here to assist and help you optimizing wine production and quality regardless the method you select.

METHODS	CARBONATION	ANCESTRAL	CLASSIC	TRANSFER	CHARMAT
BASE WINE	✓	✓	✓	✓	✓
YEAST STARTER + SUGAR	-	STOP FERMENTATION	✓	✓	-
TIRAGE	-	✓	✓	✓	2ND FERMENTATION IN TANK
BOTTLE AGING	-	-	✓	✓	-
DISGORGING	-	-	✓	TRANSFER TO TANK	-
DOSAGE	CARBONATE	-	✓	DOSAGE IN TANK	
FINAL STEP	FILL & CORK BOTTLES	END FERMENTATION IN BOTTLES	CORK BOTTLES	FILL & CORK BOTTLES	

// CONTENTS

BASE WINE PRODUCTION

a) Process overview

1. Harvest

Grapes destinated for sparkling wine are harvested at low brix and higher acidity to keep freshness and brightness. It is optimal to pick the morning or at night while temperature is cool **to limit oxidation and microbial contamination**.

Limiting SO_2 use while having an antioxidant protection and preventing microbial development during transportation is important – favor alternatives to SO_2.

2. Pressing

Pressing is a crucial step in the sparkling process. It is recommended **to press whole cluster**, choose a press program allowing a **slow increase in pressure** with minimum rotations (Cremant cycle) and **separate first 3-5% juices** coming from transportation, and press fractions.

3. Preparation of juice

It is important to consider quality variations from press juices to choose and adapt the winemaking process. Removal of undesired elements present in juice (solids, polyphenols, color, proteins, lipids, etc.) before starting fermentation is fundamental. In sparkling wine production, fining is used **to remove unwanted elements** while respecting foaming properties.

4. Base wine fermentation

The objective in base wine production is to have a clean and complete fermentation to produce a wine and environment favorable to the second fermentation: low VA, low total SO_2, low residual CO_2 and low alcohol (< 11.5 %) with clean, fresh and desirable aromas.

5. MLF

MLF is done to soften the acidity and reduce malic acid for microbial stability. Sometimes, it is preferred to not go through MLF to maintain the freshness and fruity aromas in the wine.

If MLF is desired, we recommend **co-inoculation**. The low pH, alcohol present and cold temperature of the base wine can inhibit ML bacteria. With co-inoculation, ML bacteria benefits of **less stress**, **higher temperature**, **lower alcohol** and will metabolize diacetyl to very low concentration.

6. Tartrate stabilisation

Tartrate stabilization is vital for sparkling wine, as tartrate crystals are unsightly and can cause gushing at disgorging and in the finished wine.

Tartrate stabilization can be achieved by traditional cold hold or using alternatives, more sustainable, and very effective to prevent tartrate crystal formation, such as the use of mannoproteins, which **inhibit crystal growth and formation**. When testing for tartrate stability in base wine, adjust alcohol content of sample with +1-1.5%.

Recommended test: Crystallisation (3 days at -4C) or ISCT50 (conductivity).

7. Protein stability

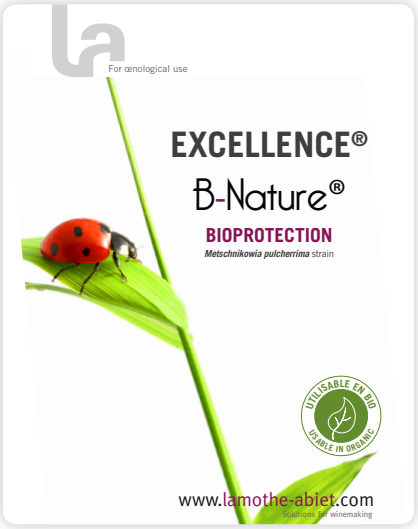
Protein stabilization should be decided by considering the instability and the positive impact of proteins on the persistence of the mousse. Must proteins, contrary to proteins released by yeasts during AF, are all unstable and do not enhance the mousse of sparkling wines.

Furthermore, musts sometimes contain fatty acids from the grape skin. These are also detrimental to the quality of the mousse. It is therefore highly recommended to treat the must, and not the finished wine, with bentonite.

b) Base wine production protocol (traditionnal, transfer and charmat methods)

HARVEST AND GRAPE TRANSPORT	**1. Limit SO_2**: to improve fermentation capacities. **2. Protect against oxidation:** work fast, at low temperature and protect from oxygen with inert gas. Use **Tanin Gallique à l'alcool**, 10 g/hL, to prevent oxidation from oxidative enzyme and improve protein stability. **3. Protect grapes microbial spoilage:** use **Excellence® B-Nature**, 50 g/ton.
PRESSING	**4. Choose a press program allowing a slow increase in pressure with minimum rotations (Cremant cycle) and separate press fractions:** - First 3-5% of juice coming out while filling press are rich in pesticides, dust and lipids, thus reducing the fermentation ability and foam capacity and quality. It is important to separate them ; - Hard press fractions are rich in phenolic compounds and have higher pH, best to separate them and treat them aside.
CLARIFICATION AND JUICE PREPARATION	**5. Ensure a quick and clean settling:** use **Œnozym® Clar** at 2 mL/hL in the press pan. **6. Fining to eliminate oxidized and oxidable phenolic compounds, and stabilize wine :** - Low pressure fractions: **Polymix® Natur'** at 10 g/hL; - Hard press fraction + first juice fraction: **Polymix® Natur'** at 40 g/hL. Turbidity: 200 NTU to optimize varietal aromas production.
FERMENTATION	**7. The choice of the yeast for base wine production has a high impact on the style of base wine.** The most important parameters are to produce a clean, 'pure' and fresh wine, with some round and balanced mouthfeel : - **Excellence® TXL** at 20 g/hL to produce elegant, pure and complex aromatic profile with round mouthfeel. - **Excellence® E2F** at 20 g/hL to produce a pure and fresh aromatic profile, focused on terroir expression. - **Excellence® STR** at 20 g/hL is interesting for fresh, floral and fruity wine where aromatic expression is the focus. **8. Rehydrate yeast:** use **ŒnoStim®** at 30 g/hL to reinforce yeast activity, limit fermentation risks, increase aromatic production and optimize grape expression. **9. Ensure good yeast nutrition and reduce off-flavors production:** use **Optiflore O®** at 30 g/hL at inoculation. **10. For protein stability:** 10-20 g/hL of **Bentosol Poudre** at 1/3 of fermentation.
MALOLACTIC FERMENTATION	**11. If MLF is wanted:** add **Œno 1®** at 1 g/hL 48 hours after yeast addition. **If MLF is not wanted:** to maintain acidity and freshness, use **KillBrett®** at 4 g/hL at the end of fermentation to eliminate any spoilage microbes and prevent MLF to happen.
BASE WINE STORAGE	**12. To maintain base wine fresh before 'prise de mousse':** add **Aroma Protect®** 10 g/hL after fermentation. **13. Limit SO_2 addition:** < 15 ppm Free SO_2 ; < 40 ppm Total SO_2 to ensure an optimal 'prise de mousse'. Be careful no addition of SO_2 within 15 days off tirage. **14. Keep wines at low temperature (50-53°F).** OPTION: Add 1 g/hL of **Tan&Sense® Volume** to increase wine antioxidant potential and balance mouthfeel.

c) Focus product



EXCELLENCE® B-NATURE®

Limiting SO_2 use while preventing microbial development during transportation is essential in sparkling wine production.

Excellence® B-Nature®, is a pure *Metschnikowia pulcherrima* used as bio-protection. A **natural anti-microbial solution** used as alternative to SO_2 on grapes for microbial control. It **inhibits the development of spoilage microbes** (non-*Saccharomyces* yeasts such as *Brettanomyces*, as well as bacteria) on grapes.

BENEFITS

- 100% *Metschnikowia pulcherrima*
- No fermentation capacities, no consumption of nitrogen
- No inhibition of *Saccharomyces cerevisiae*
- Strong dominance and implantation capacities
- Strong anti-microbial effect due to production of pulcherrimine

Applications: Reduce, replace or complement the use of SO_2 on grapes.
Protect grapes/juice from microbial contamination during transport and processing.
Reduction of SO_2 combining compounds increase SO_2 efficiency.
Dosage: 30- 50 g/ton, direct sprinkling on grapes, ASAP after picking. No rehydration required.

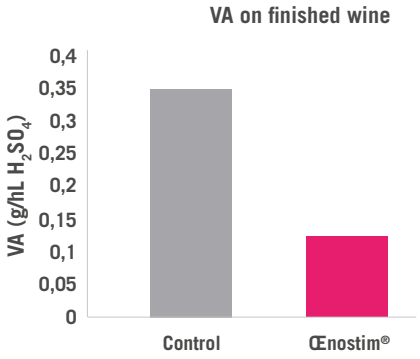
ŒNOSTIM®

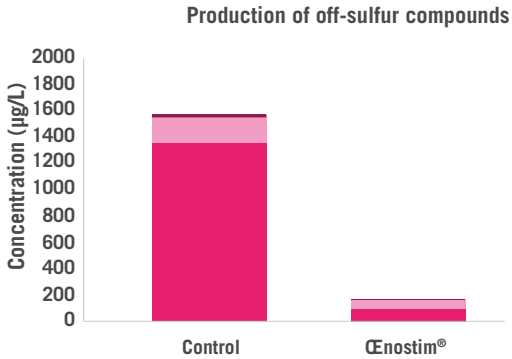
Inactivated yeasts naturally rich in growth factors (vitamins, mineral elements) and survival factors (sterols, unsaturated fatty acids)

ŒnoStim® **reinforces yeast activity and metabolism**, limits fermentation risks, prevents off-flavors production and increases aromatic production.

BENEFITS

- Ensures good yeast implantation
- Shortens lag phase
- Increases yeast resistance to difficult conditions
- Regulates and helps completion of AF





Applications: Addition in rehydration water, at yeast preparation. **Dosage:** 20-30 g/hL depending stress conditions.

OPTIFLORE O®

Rich in easily assimilable amino acids as well as vitamins, minerals and oligoelements

Optiflore® O ensures **qualitative nutrition** for yeast, thus limiting fermentation risks, off-flavors production and increasing aromatic production.

BENEFITS

- Increase aromatic complexity
- Limit H_2S production
- Detoxifiant to reduce stress conditions
- Alternative to DAP :

  sustainable nutrition, no overproduction of biomass, does not cause nitrogen catabolic repression, maintain cells in optimal physiological state

Applications: Addition of 10 g/hL of Optiflore® O provides 5 mg/L of nitrogen in amino form, equivalent to an addition of 15mg/L of assimilable nitrogen.

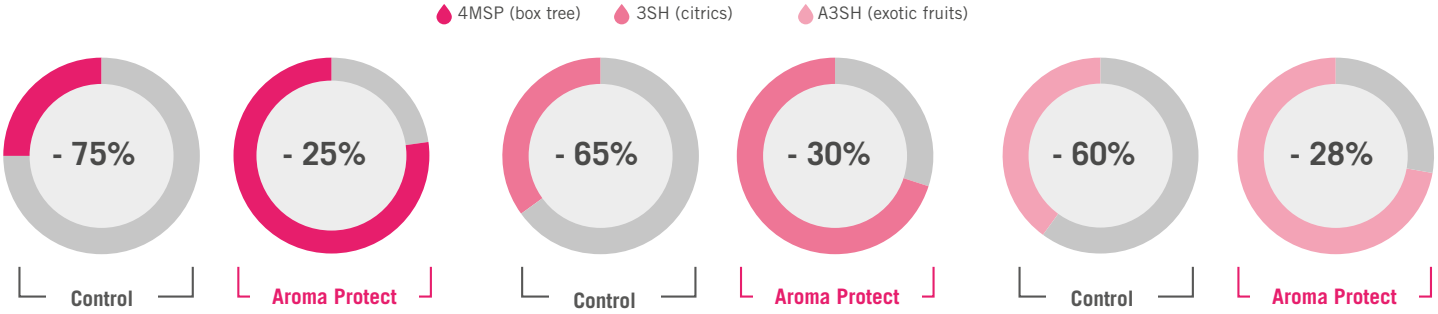
AROMA PROTECT®

Inactivated yeast rich in Glutathione and Cystein for aromatic protection of wines

Producing aroma is one challenge, protecting them is another. Aroma Protect®, composed of inactivated yeasts naturally rich in glutathione and other reducing compounds, is an essential tool to address this challenge.

Aroma Protect® increases **natural anti-oxidant potential** of the wine, **reduces buffer redox potential** and **improves wine shelf life**.

Percentage of decrease in thiols aromas of Sauvignon Blanc wine (6 months after end of AF)



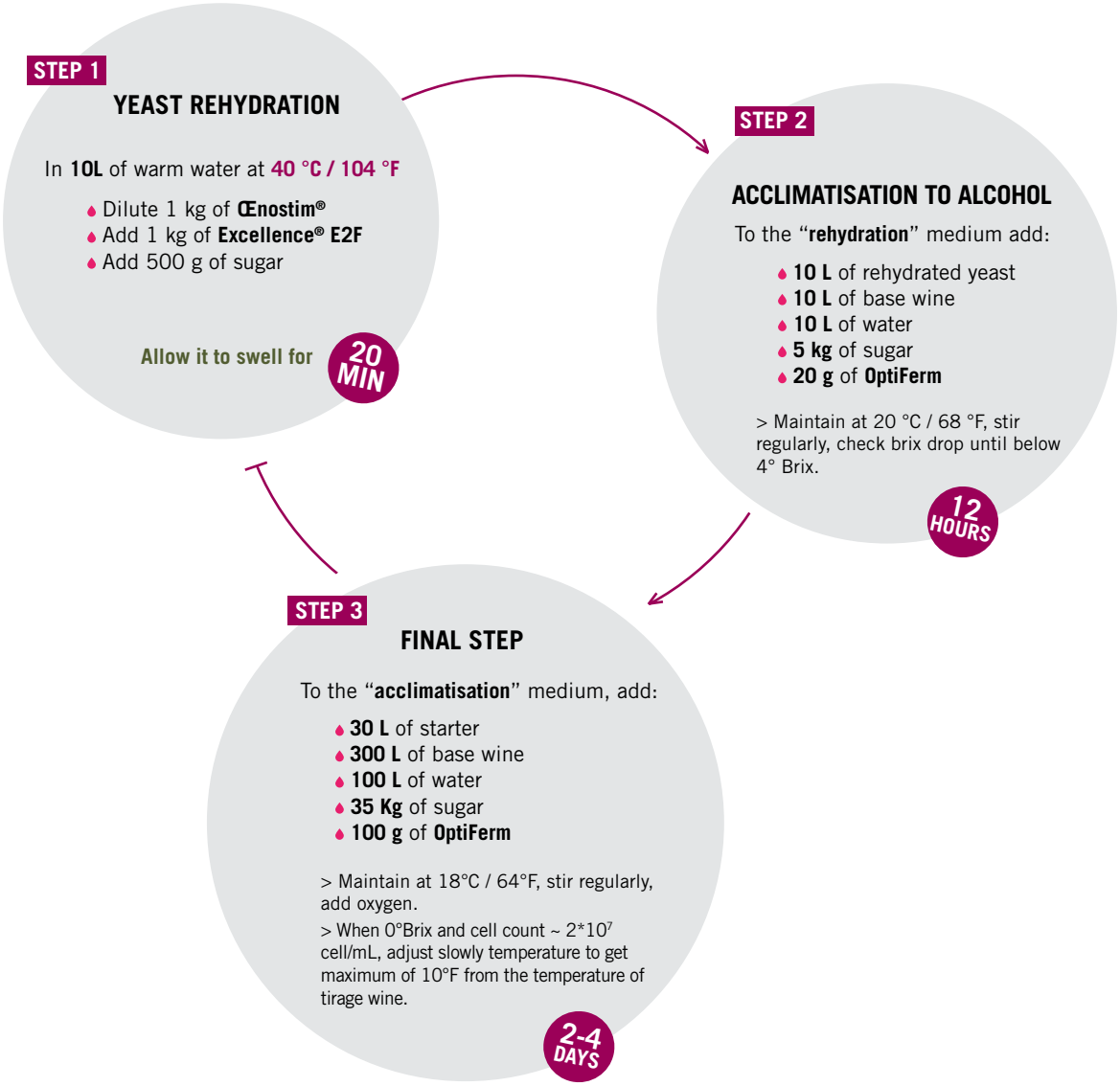
YEAST STARTER PREPARATION – 3-5% OF BASE WINE VOLUME

a) Process overview

The preparation of the yeast starter is very important and determine the success of the 'prise de mousse' and quality of final wine. The environment in which the yeast multiply and evolve is particularly hostile: SO_2, high CO_2, low pH, low temperature, confined and unmixed environment.

Therefore it is essential to use a **fructophilic yeast, resistant to extreme conditions**, such as **Excellence® E2F** and protect it by reinforcing its resistance to extreme conditions and providing essential sterols with **ŒnoStim®** is crucial during yeast preparation as well as acclimating the yeast to base wine and favoring multiplication with oxygen presence.

b) Protocol for 100 hL of base wine (3-5% yeast starter)



Final objectif: Viable cells >2*10^7 cell/mL, viability > 80%. To boost fruity, fresh aromas and esters production, add OptiEsters® at 30 g/hL at the at the final stage of pied de cuve preparation.

c) Focus product

EXCELLENCE® E2F

BENEFITS

- Résistance élevée à l'alcool : jusqu'à 17% Vol. – caractère fructophile important
- Cinétique fermentaire régulière et complète
- Implantation rapide dans le milieu
- Faible production d'AV et de H_2S
- Faible production de composés secondaires – pureté aromatique
- Bilan SO_2 négatif *

**Toutes les levures LAMOTHE-ABIET présentent un bilan SO_2 négatif ou nul.*

a) Process overview

The tirage liquor concentration is determining the final alcohol content and pressure in your sparkling. Traditionally, the final pressure target is around 6 bars. For early-to-market sparkling wines, producers may lower their final pressure target, resulting in smaller bubbles and 'creamier' texture.

The tirage liquor can also contains **tannins** and **polysaccharides** to improve wine mouthfeel, foaming capacities, and wine oxidation resistance. Bench trials are possible, ask for your Lamothe-Abiet kit.

b) Protocol: Calculate sugar concentration

Sugar concentration: Fermentation of 4 g/L of sugar will result in 1 bar of pressure at 10°C.

Alc base wine (%)	Sugar (g/L) for 5 bars	Sugar (g/L) for 6 bars
10	19	23
11	21	25
12	22	26

c) Focus product

EXCELGOM®, SUBLI'SENSE® & MANNO'SENSE®

Excelgom® is a **pure powdered Arabic gum** from *Acacia Seyal*. Excelgom® is obtained from a **very strict selection** and a **unique process** to be instantly dissolved into water or wine. It doesn't contain SO_2.

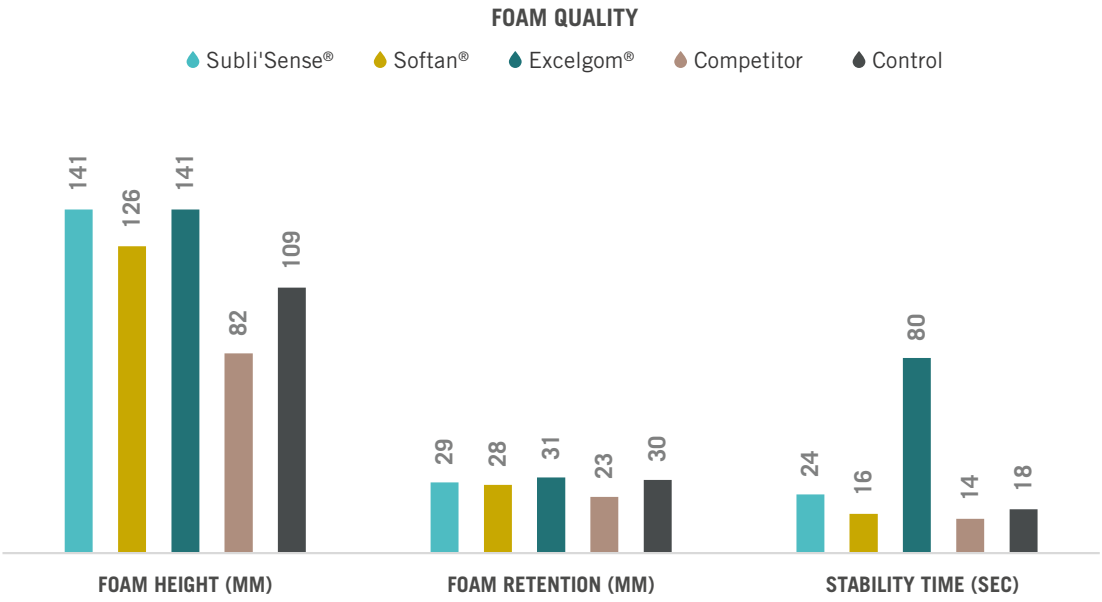
Subli'Sense® is a solution of **arabic gum** and **mannoproteins** for **colloid stabilization** and **mouthfeel improvement**.

Manno'Sense® is a formulation of **mannoproteins rich in sapid peptides**, playing a crucial role in the **perception of sucrosity**.

BENEFITS

- Prevent precipitation of coloring matters => well adapted to rose sparkling wines
- Improves organoleptic qualities by increasing volume and roundness
- Reduces tannin dryness
- Improves foam capacity and quality
- Manno'Sense®: adds balance and freshness to the palate

Applications: Tirage, Disgorging.
Dosage: 20-120 g/hL.
Packaging: Excelgom®, 1kg - Subli'Sense®, Manno'Sense®, 5L and 20L.



SOFTAN® FINITION

Specific tannins combined with natural polysaccharides of plant origin for maturation of wines

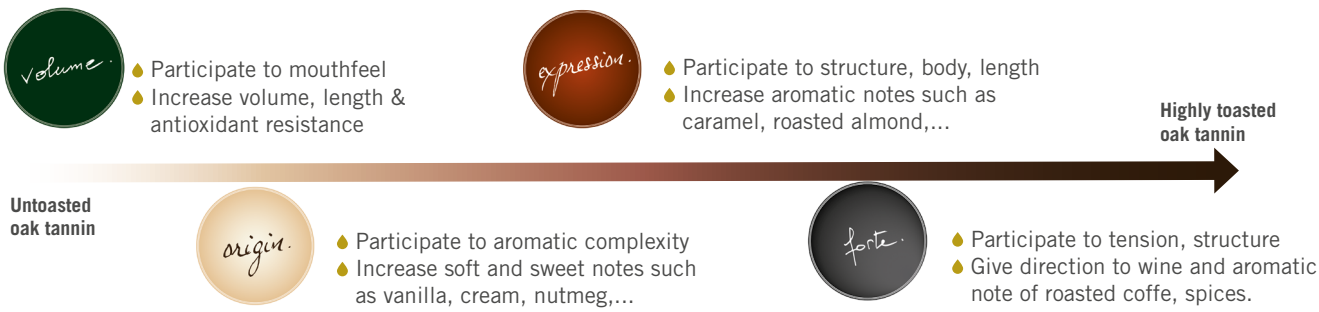
The **Softan®** range is based on a technology that is exclusive to Lamothe-Abiet. It offers solutions for each step of wine production thanks to its formulations of **specific tannins combined with natural polysaccharides of plant origin**. This technology is based on a phenomenon which naturally takes place in wines wherein the tannins combine with polysaccharides.

Softan® Finition (FT) products significantly increase the **volume** and **length** of the wine without adding dryness or astringency, , it increases aromatic complexity and participate to foam quality.

Dosage: 2-15 g/hL. **Application:** Base wine, tirage, disgorging. **Packaging:** 250 g.

TAN&SENSE®

High quality oak tannin, extracted with unique technology from oak staves, to increase stability and aromatic complexity to wine



Applications: Base wine, tirage, disgorging. **Dosage:** 0.5-5 g/hL. **Packaging:** 250 g.

PREPARATION OF RIDDLING AIDS – TRADITIONNAL METHOD

a) Process overview

Riddling is rotating the movement of the bottles after the secondary fermentation, done to bring the yeast into the neck of the bottle for a good disgorging. Riddling agents are adjuvants used to help yeast to agglomerate, sediment smoothly and compact in the bottle without sticking to the glass.

The riddling aids, especially when formulated with alginates, are likely to turn to gel immediately if added on their own to the wine. It is therefore highly recommended to first add them to the yeast starter or at exactly the same time as adding the yeast starter.

b) Focus product

BENTOSOL POUDRE

Powdered sodium bentonite for manual & mechanical riddling

BENEFITS

- Selected for its strong deproteinizing ability, and its compacting potential
- Preserve wines' aromas
- Effective over a wide range of pH, particularly at high pH (>3.4)

Dosage : 10-20 g/hL.

ALGINATE E2F®

Liquid formulation of bentonite and alginate

BENEFITS

- Selected for its low deproteinizing capacity and its compacting potential
- Help to reduce riddling time
- Give a compact deposit that does not stick and is easy to remove

Dosage : 7-10 cL/hLL.

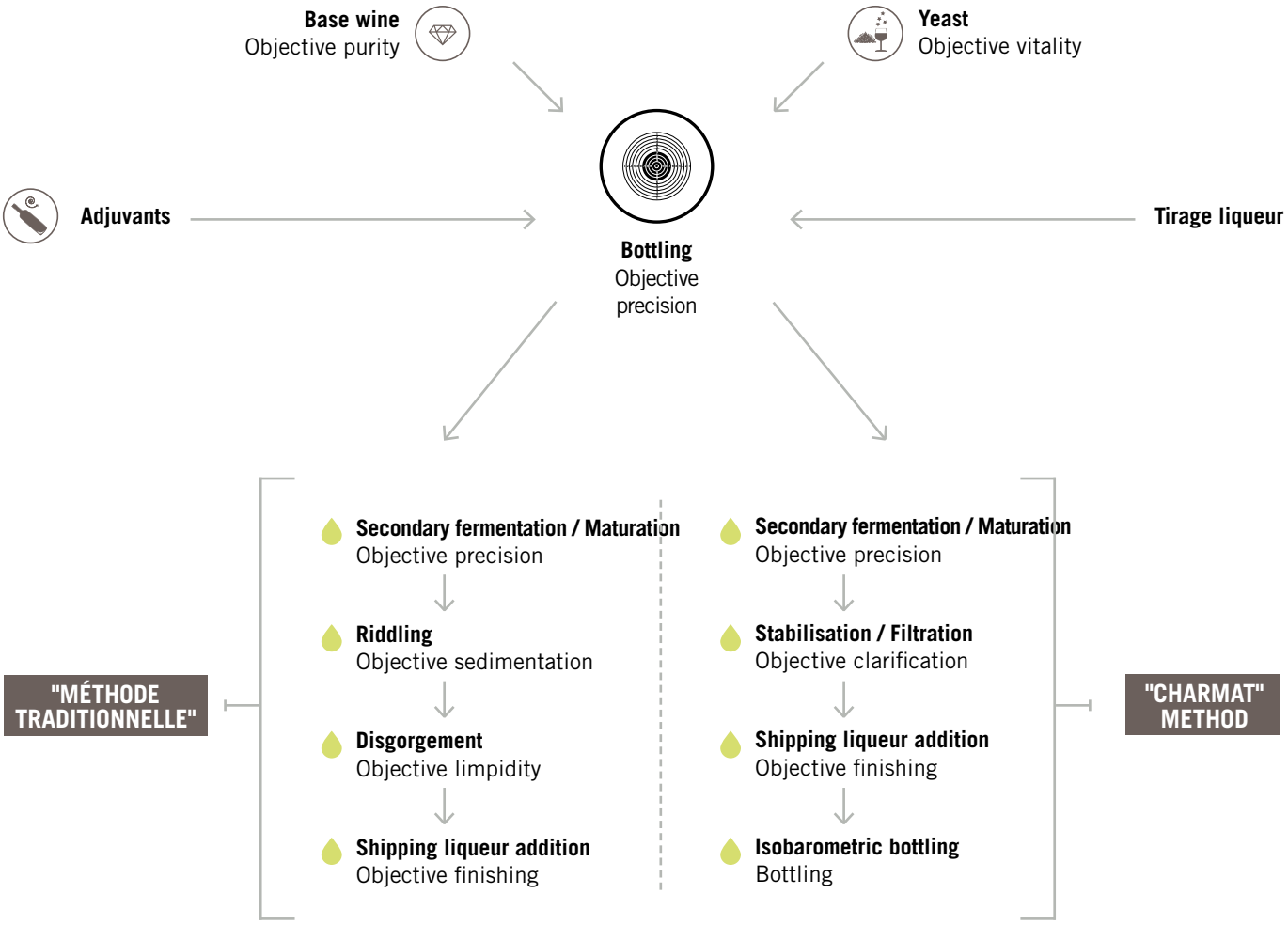
TIRAGE

a) Process overview

Tirage is the cornerstone of the sparkling wine to come and requires the upmost precision. It involves putting into bottle perfectly homogeneously 4 essential constituents for a good secondary fermentation: clarified and stabilized **base wine**, ready and healthy **yeast culture**, **adjuvant/riddling aid**, and **tirage liquor**.

b) Protocol and recommendations

1. **Stir well the tank** throughout the entire tirage process **to have a perfectly homogeneous mixture** and **prevent any later difficulties** (riddling problems through lack of adjuvant, sluggish fermentation due to lack of yeast starter, etc.).
2. Respect **perfect hygiene measures** to avoid any microbial contamination.
3. Avoid heat shocks to the yeast during the tirage: **control the temperature** of the wine, the starter, the bottles, and the air temperature when bottles are being transferred between storage and tirage.
4. Yeast population in bottle: **ideal initial population in bottle ~ 2-5*10^6 viable cells/mL**.



DISGORGING / BOTTLING – TRADITIONNAL /TRANSFER/ CHARMAT METHODS

Disgorgement involves removing the deposit which has been formed after the secondary fermentation and brought down to the neck of the bottle during riddling. This aim of this operation is to ensure the subsequent limpidity of the wine in the bottle.

A real signature of each sparkling wine, the expedition liqueur is **the last change made to the wine as it is added in bottle after disgorgement or before bottling**. It must therefore be prepared with care. It can be made up of wine, grape must, sugar, eau-de-vie, finishing tannins and polysaccharides, SO_2, … When we are using transfer or charmat method, the final adjustments of the wine, can be done in tank.

Lamothe-Abiet has developed a **range of products designed for sparkling wines to improve wine profile** to meet the needs of each market: softness, mouthfeel, elegance and finesse, foam quality, freshness or aromatic complexity. These products can be added during tirage or with the liqueur expedition, at disgorgement. ***Ask for your trial kit!***

FAQs

// L.A SOLUTIONS

	RECOMMENDATIONS
WHAT TYPE OF SUGAR CAN BE USED FOR THE DISGORGING LIQUEUR?	**Cane sugar** or **beet root sugar**. Cane sugar is most commonly used for its purity, but it still needs to be mixed and filtered. Beet root sugar can be used if the purity is good.
DOES MY DISGORGING LIQUEUR NEED TO BE FILTERED PRIOR TO USE?	Yes, it is very important to have a **clean dosage liqueur** for microbial stability and particle removal.
WHAT ADDITIVES CAN BE USED IN THE DISGORGING LIQUEUR?	SO_2, Tannins, CMC, Yeast extracts, Gum Arabic, Mannoproteins,…
HOW MUCH SUGAR CAN I USE IN THE EXPEDITION LIQUOR?	

	Champagne*	Prosecco**	Cava do***
Sweet	> 50 g/L RS	-	> 50 g/L RS
Semi dry	32-50 g/L RS	32-50 g/L RS	32-50 g/L RS
Dry	17-32 g/L RS	17-32 g/L RS	17-32 g/L RS
Extra dry	12-17 g/L RS	12-17 g/L RS	12-17 g/L RS
Brut	12 g/L RS	12 g/L RS	12 g/L RS
Extra brut	0-6 g/L RS	-	< 6 g/L RS
Brut nature	0-3 g/L RS	-	< 3 g/L RS

PREVENTING GUSHING	**The most common root cause is insoluble particles in the base wine that do not clear through riddling and disgorging.** Common residual impurities include bentonite, silica gel, cellulose fibers, yeast, bacteria and calcium or potassium tartrates. It is vital that clean, quality bottles free of interior imperfections be used. Imperfections in the glass will be points of emanation for bubbles. **Excess sugar at tirage will result in too much CO_2, which can cause gushing.** Time in the bottle and cap permeability result in different levels of CO_2 over the tirage period. Prior to disgorging, the wine should rest without movement for 3–5 days. Ideally, it should be chilled to 2°C (35° F).

LAMOTHE-ABIET

Solutions for winemaking

WWW.BVNORTHAMERICA.COM/LAMOTHE