

# LAMOTHE-ABIET



## Cidermaking brochure

Fermenting fruit sources other than grapes can pose many challenges including nutrient deficiency, high pectin content, lower starting sugar, etc.

The most common challenges in cidermaking are settling and filtration, mitigating sulphur-off compounds production and other reductive compounds during fermentation as well as microbial management.



## EXCELLENCE® B-NATURE®

Pure *Metschnikowia pulcherrima* strain, used as bio-protection.

Lamothe-Abiet has selected Excellence® B-Nature®, an **anti-microbial solution, used as alternative to SO<sub>2</sub> for microbial control.**

**It inhibits, in the early stages of cidermaking, the development of spoilage microbes (non-*Saccharomyces*, *Brettanomyces*, as well as bacteria).**

### BENEFITS

- ◆ Control microbiological flora
- ◆ Replace or complement the use of SO<sub>2</sub> on apples/juice
- ◆ Protect apples/juice from microbial contamination during processing
- ◆ Reduction of SO<sub>2</sub> combining compounds=> increase SO<sub>2</sub> efficiency
- ◆ Increased aromatic complexity of the cider

**Yeasts are at the heart of Lamothe-Abiet's oenological expertise. Excellence® yeasts are selected via breeding technique, which allow us to ensure:**

- High implantation
- Short lag phase
- Resistance to difficult conditions and stress (high alcohol, wide range of temperature, wide range of turbidity, ...)
- Low production of VA, H<sub>2</sub>S
- POF (-) : no production of Phenolic Off-Flavors
- URE2 (-) : aromatic optimization, no catabolic repression

### TO KNOW

**YEAST PREPARATION AND REHYDRATION** - Proper yeast rehydration is one of the most important steps to help ensure a strong and healthy fermentation.

1. Suspend 2.5 lbs/1000 gal (30 g/hL) of OenoStim in 20 times its weight of clean, chlorine free, 110°F (43°C) water.
2. Once the temperature of the solution has dropped to 104°F (40°C), add 2 lbs/1000 gal (25 g/hL) of active dried yeast. Stir gently to break up any clumps. Let suspension stand for 20 minutes, then stir gently again.
3. Slowly add some juice to the yeast suspension to drop temperature 18°F (10°C). This will help the yeast adjust to the cooler temperature of the juice and will help avoid cold shock caused by a rapid temperature drop. Wait 20 min. This acclimation step may need repeating for very low temperature juice.
4. Once yeast preparation temperature is within 18F of difference with the tank, add the yeast preparation to fermentation vessel and mix gently.

	VARIETAL	CHARACTERISTICS
EXCELLENCE® YEASTS	FTH	<ul style="list-style-type: none"> <li>• Fresh, intense expression of thiolic compounds. Citrus, Lime, Grapefruit, boxwood aromas.</li> <li>• Lively, direct, fresh and vibrant mouthfeel.</li> <li>• Recommendations: Fresh, citrus, easy to drink.</li> </ul>
	TXL	<ul style="list-style-type: none"> <li>• Complex expression of volatile thiols and esters. Citrus, Fruity and tropical fruits.</li> <li>• Complex, round and rich mouthfeel.</li> <li>• Recommendations: Great for ageing on lees.</li> </ul>
	STR	<ul style="list-style-type: none"> <li>• Strong production of esters and acetates. Stonefruit, floral, 'sweet' tropical fruit notes.</li> <li>• Balanced, vibrant and fresh mouthfeel.</li> <li>• Recommendations: Boost freshness, fruity aromatics.</li> </ul>
	XR	<ul style="list-style-type: none"> <li>• Terroir expression, aromatic complexity. Dark fruits, spices.</li> <li>• Complex, structured and round mouthfeel.</li> <li>• Recommendations: Terroir, Complex, long ageing ciders.</li> </ul>
L.A YEAST	BAYANUS	<ul style="list-style-type: none"> <li>• Fresh, fruity and clean aromatic profile.</li> <li>• Clean, and rich mouthfeel.</li> <li>• Recommendations: Second fermentation, restart, neutral base cider.</li> </ul>

## NUTRIENTS AND YEAST DERIVATES



**Nutrient management is an essential part of cidermaking; to ensure regular and complete fermentations, minimizing sulfur -off compound production, while enhancing positive sensory qualities. Yeast assimilable nitrogen (YAN) is composed of amino acids (organic nitrogen) and ammonium ions (inorganic nitrogen).**

The ammonium ions can be assimilated **easily** and **quickly** by the yeast. The amino acids are consumed slowly but on a continued basis by the yeast. **Organic nitrogen** has been shown to be **3-5 times more efficient** when compared to equivalent nitrogen values of DAP (ammonium ions).

**When complex nutrient strategies include organic forms of nitrogen the kinetics are more controlled with less likelihood of heat spikes when compared to just straight DAP additions.** Less stress on the yeast can help minimize off-aroma production during fermentation.

### TO KNOW

#### WHAT ARE THE NUTRITIONAL NEEDS OF YEAST?

Yeast Assimilable Nitrogen (YAN), vitamins (thiamine) and mineral salts (Mg, Zn) are essential for yeast activity. Additionally, sterols and long-chain unsaturated fatty acids are elements which protect yeast and help them to survive in stressful conditions. The quantity and quality of these compounds play an essential role in yeast metabolism, fermentation kinetics and the organoleptic profile of cider.

#### WHAT IS YEAST ASSIMILABLE NITROGEN (YAN)?

YAN is the sum of ammonium ions and alpha amino acids (except proline). Yeast use nitrogen to build proteins, cell wall components, enzyme synthesis, for growth and sugar transport. Ammonium ions are quickly and preferentially assimilated by yeast. Amino acids are used by yeast as a source of nitrogen and aromatic precursors to synthesize higher alcohols, esters and acetates.

#### WHAT ARE THE SOURCES OF YAN IN APPLES?

Fruits provide nitrogen in the form of proteins, peptides, alpha amino acids and ammonium ions, though to a lesser degree than grapes. Cider can be currently made from fresh apples of dual-purpose and dessert cultivars, juice and/or concentrate. Relative to grapes, apples tend to have lower endogenous YAN (Yeast Assimilable Nutrient) concentrations. YAN can be variable across apple varieties, orchards and even the age of the fruit. Clarified juice and juice from concentrate will always have lower nutrient levels than their fresh pressed counterparts.

#### HOW MUCH YAN IS NEEDED?

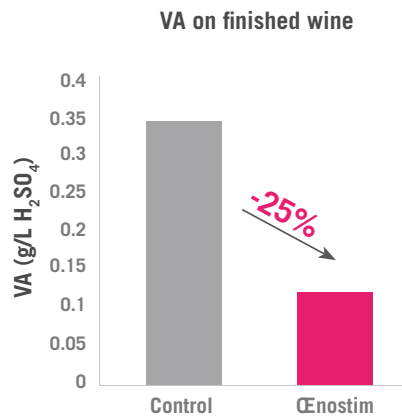
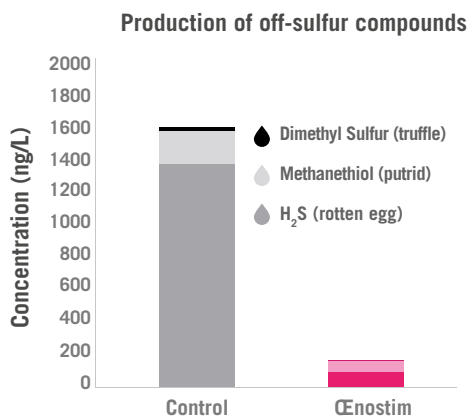
The range of YAN can vary depending on vintage conditions, culture practices and selection of cultivated varieties. As a general rule, we recommend aiming for YAN's of 150–200 mg/L in cidermaking.

# ÆNOSTIM®

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

BENEFITS

- ◆ Reinforces yeast activity and metabolism, limits fermentation risks, prevents off-flavors production and increases aromatic production
- ◆ Ensures good yeast implantation and shortens lag phase
- ◆ Improves yeast cell wall health and increases yeast resistance to difficult conditions
- ◆ Regulates and helps completion of AF



**Dosage:** 2.5 lbs/1000 gal (30 g/hL).

**Application:** Addition in rehydration water, at yeast preparation.

# OPTIFLORE 0®

Yeast nutrient, 100% organic nitrogen for an essential, and efficient nutrition. High nutritive power nutrient.

BENEFITS

- ◆ Alternative to DAP and rich in easily assimilable amino acids as well as vitamins, minerals and oligoelements
- ◆ Qualitative and sustainable nutrition for yeast
- ◆ Limit fermentation risks, off-flavors production and increase aromatic production
- ◆ Maintain yeast cells in optimal physiological state
- ◆ No overproduction of biomass
- ◆ Acts as detoxifiant to reduce stress conditions

# OPTIFERM

Blend of inactivated yeast, amino acids (organic nitrogen), sterols, unsaturated fatty acids, and inorganic ammonium salts (DAP).

BENEFITS

- ◆ Unsaturated fatty acids and sterols provided are important survival factors needed to maintain alcohol resistance and fermentation activity
- ◆ The presence of both forms of nitrogen provides a complex and complete nutrition
- ◆ The cell wall fractions absorb short and medium chain fatty acids that are toxic to the yeast. They also provide nucleation sites to help keep the yeast in suspension

**Dosage:** 1.6 – 3.2 lbs/1000 gal (20-40 g/hL).

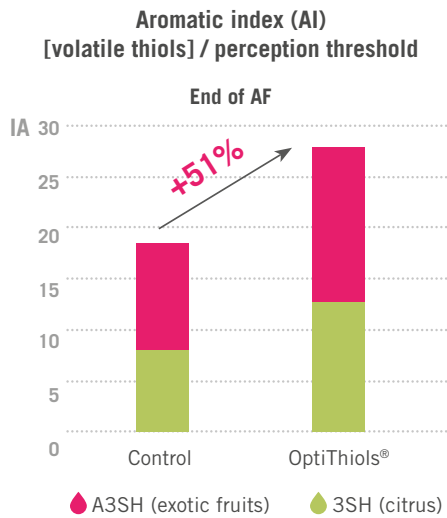
**Application:** during fermentation.

# OPTITHIOLS®

Inactivated yeast rich in Glutathione and Cystein derivatives to increase thiolic compounds production and antioxidant potential

BENEFITS

- ◆ Generates a very significant increase in aromas (30 - 120%)
- ◆ Increases thiolic compounds production by yeast
- ◆ Increases anti-oxidant wine potential

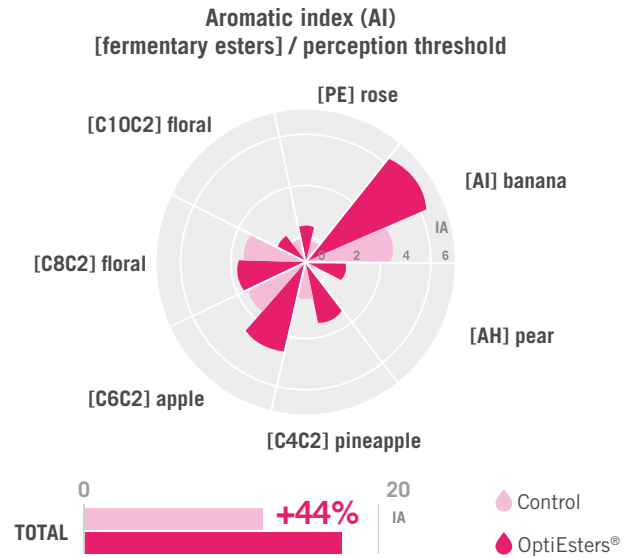


# OPTIESTERS®

Selection of amino acids and ergosterols to increase the aromatic intensity and freshness of wines

BENEFITS

- ◆ Important role in defining the profile of aromatic esters, both in their quality and quantity
- ◆ Increase stone fruits, fresh fruits and floral notes



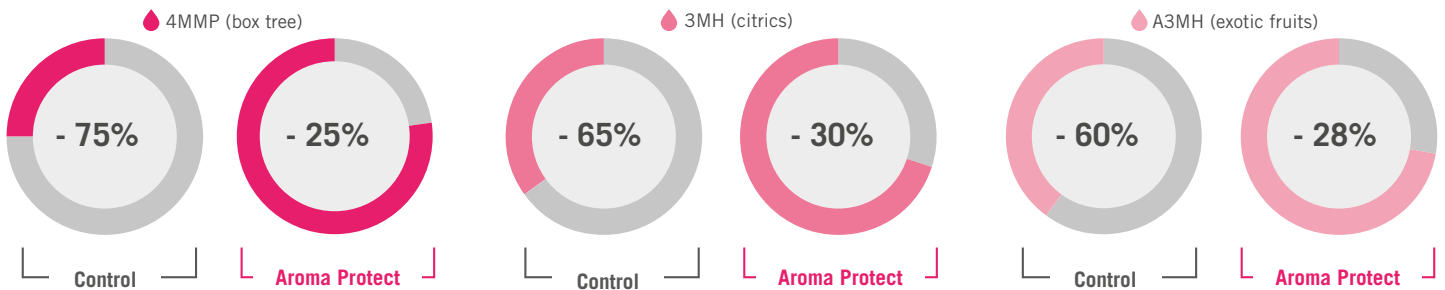
**Dosage:** 1.6-2.5 lbs/1000 gal (20-30 g/hL).    **Application:** OptiThiols: at inoculation. OptiEsters: during first 1/3 of fermentation.

# AROMA PROTECT®

Inactivated yeast rich in Glutathione and Cystein derivatives to increase anti-oxidant resistance of the cider and control redox potential

Producing aroma is one challenge, protect 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.

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



**Dosage:** 0.7 – 2.5 lbs/1000 gal (10-30 g/hL).    **Application:** end of AF or MLF, early maturation.

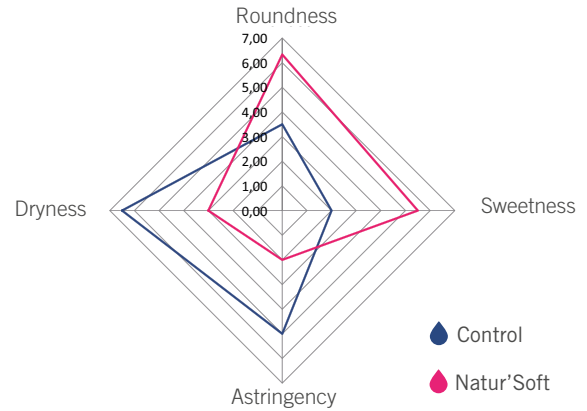
# NATUR'SOFT®

Preparation of specific yeasts hulls, selected for their high content of polysaccharides

## BENEFITS

- ◆ Increases cider **complexity**
- ◆ Reduces tannins perception
- ◆ Enhances **fruity characters**

Mouthfeel perception Control - Natur'Soft



**Dosage:** 1.6 – 3.2 lbs/1000 gal (20-40 g/hL).

**Application:** during fermentation.

# ACTIBIOL

Bioactivator of the alcoholic fermentation, made of yeast wall cells, inactivated yeasts and cellulose support elements

## BENEFITS

- ◆ Help yeast development and extends fermentation activity
- ◆ Helps highly clarified juices as a yeast support
- ◆ Facilitate the restarting of fermentations

**Dosage:** 1.6 - 3.2 lbs/1000 gal (20-40 g/hL).

**Application:** end of fermentation, before restart fermentation.

# ML BACTERIA



**Malolactic bacteria converts malic acid to lactic acid, but is not always desired in cider production. It can, however, have a direct impact on cider quality.** Uncontrolled spontaneous malolactic fermentations or wild lactic acid bacteria can result in diminished varietal and fruit flavors, reduced esters, masked aromas and off-characters. The use of selected malolactic strains can **contribute positively to ciders while minimizing risks**. It is very important to know the status of the cider prior to inoculating with malolactic bacteria.

## Principal factors influencing lactic acid bacteria:

MLF problems can arise when pH is low (<3.4), alcohol is high (>14.5%), temperature is low (<65°F) or high (>80°F), total SO<sub>2</sub> is high (>50 mg/L) and/or free SO<sub>2</sub> is high (>10 mg/L). These four parameters (pH, temperature, alcohol and SO<sub>2</sub>) have a negative synergistic effect, making the completion of Malolactic conversion difficult when combined.

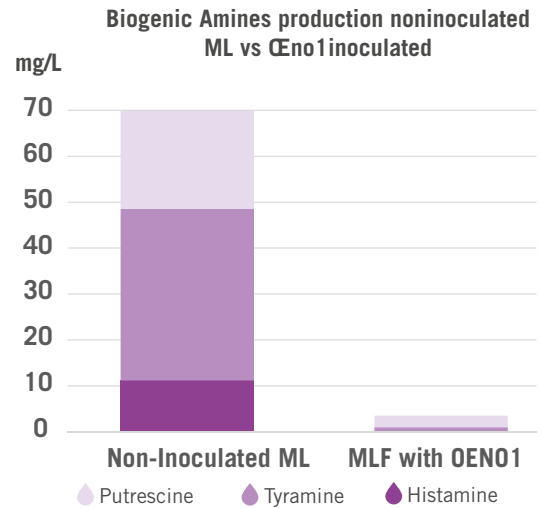
Compatibility between yeast and bacterial strains is another significant consideration. With minor impact, residual pesticides, initial malic acid and phenolic content can also be stress factors.

# ŒNO 1®

*Oenococcus oeni* for MLF. Well adapted and resistant to extreme conditions.

## BENEFITS

- ◆ Produces fruity, fresh and clean cider profile
- ◆ Low biogenic amines production
- ◆ Low VA, acetaldehyde and off-aromas production
- ◆ Low diacetyl production



**Dosage:** 1-2 g/hL.

**Application:** Co-inoculation - especially recommended with Excellence® XR  
Sequential inoculation • Adapted for MLF restart • Direct addition

# ENZYMES



Using pectolytic enzymes on milled apples prior to pressing increases juice extraction rates, especially for cold storage apples with high pectin level due to the breakdown of cellular walls.

After pressing, it is important to **apply clarification enzymes to improve settling and dramatically improve filterability**. Pectins make up 1-1.5% of total solids in apple juice and are usually the cause of difficult clarification and pre-bottling filtration issues. Clarification enzymes also helps in precipitating microbes and reducing overall population.

## ŒNOZYM® THIOLS

Pectolytic enzyme preparation from *Aspergillus niger* free from cinnamyl-esterase activity used to increase thiolic compounds expression

## BENEFITS

- ◆ Increase conversion rate of thiolic precursors and aromatic intensity and lifespan of aromas
- ◆ Decrease the risks of losses through oxidation (pre-bottling)

**Dosage :** 150-300 mL/1000 gal (4-8 g/hL).

**Application :** during fermentation, maturation, pre-bottling.

**Packaging:** 250 mL.

## ŒNOZYM® FW

Preparation of pectolytic enzymes rich in glycosidase activity which can cut the glycosyl group from the precursors, thus expressing varietal aromatic molecules

## BENEFITS

- ◆ Help clarification
- ◆ Boost aromatic potential of cider by liberation of varietal aromas

**Dosage :** 150-300 g/1000 gal (4-8 g/hL).

Stop enzymatic activity with 5-10 g/hL of Bentosol Poudre.

**Application :** end of fermentation, maturation.

**Packaging:** 100 g.

# ENOZYM® CLAR

Liquid enzymatic formulation to accelerate the clarification of musts before alcoholic fermentation

## BENEFITS

- ◆ Increase juice yield by compacting lees
- ◆ Accelerate settling time: fast depectinization and flocculation
- ◆ Formulation active at low (<5°C) and high (<68°C) temperature
- ◆ Suitable for clarification by static settling and flotation

**Dosage :** 150-300 ml/ 1000 gal (4-8 mL/hL).

**Application :** juice, finished cider.

**Packaging:** 1L.

# FINING AND CLARIFICATION AGENTS



## POLYMIX NATUR'®

Preparation of PVPP, yeast extracts and bentonite to prevent and treat oxidation. Vegan, allergen free fining agent, alternative to casein.

## BENEFITS

- ◆ Improve clarification and adjusts color
- ◆ Shelf life wine stability: removes easily oxidable phenolic compounds, precursors of oxidation
- ◆ Clean-up aromas (removes volatile phenols)
- ◆ Reduce bitterness and smooth harsh tannins

## CASÉIMIX

Potassium caseinate instantaneously soluble for an easy application, used in juice to help to freshen cider, stabilize color and smooth mouthfeel.

## BENEFITS

- ◆ High purification and protein content
- ◆ Treat oxidized phenolics and bitter compounds
- ◆ Help to freshen wine, stabilize color and smooth mouthfeel

**Dosage :** 0.85 - 5 lbs/1000 gal (10-60 g/hL).

**Application :** pre, during or post fermentation.



## BENTOSOL POWDRE

Natural sodic bentonite for protein removal

BENEFITS

- ◆ High capacity to remove protein;
- ◆ Good lees compaction to limit lees loss;
- ◆ Low impact on aromas;

## BENTOSOL FT

Purified calco-sodic bentonite for protein stabilization

BENEFITS

- ◆ Low in crystalline silica, to prevent abrasion of the membrane and pumps of cross-flow filters;
- ◆ Enables in-line injection of bentonite straight to the cross-flow filter, saving time and cider quality.

**Dosage :** 0.85 - 16 lbs/1000 gal (10-200 g/hL).

**Application :** pre, or during fermentation, maturation.

## MICROBIAL CONTROL



## COEFF 2 & COEFF 5

Blend of potassium metabisulfite and potassium bicarbonate, self-dissolving and self-mixing, for sulfiting

BENEFITS

- ◆ Self-mixing in barrels or small tanks while reducing time and labor needed for stirring
- ◆ Easy, fast and safe to use : helps prevent overdose problems associated with traditional forms of SO<sub>2</sub>
- ◆ No need of special permit, safety training, or respirator
- ◆ Accurate, precise dosage of SO<sub>2</sub>

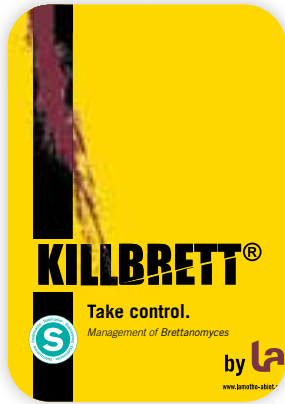
SO<sub>2</sub> contributions (mg/L) by COEFF-2 or COEFF-5 in volume of wine

SO <sub>2</sub> Dose	1 Liter	1 Gallon	60 Gallon	100 Gallon	1000 Gallon
<b>Coeff 2</b>	2,000	529	9	5	0.5
<b>Coeff 5</b>	5,000	1,321	22	13	1.3

**Dosage :** COEFF-2 releases 2 g of SO<sub>2</sub> ~ 9 mg/L in a barrel. COEFF-5 releases 5 g of SO<sub>2</sub> ~ 22 mg/L in a barrel.

**Application :** juice, maturation, pre-bottling.

**Packaging:** COEFF-2 cases of 48 tablets. COEFF-5 cases of 42 tablets.



## KILLBRETT®

Pure chitosan, for microbiological stabilization of wines and ciders

**Chitosan is a polysaccharide with a powerful and wide spectrum anti-microbial.** It eliminates and prevents the contamination of *Brettanomyces*, Lactic Acid Bacteria, and Acetic Acid Bacteria. Chitosan causes the lysis of the cell walls of spoilage microbes and their sedimentation. It is used as a **curative and/or preventive treatment**.

Easy-to-use and efficient at low dosage, KillBrett® is a pure chitosan fining agent, **vegan and non-allergenic product**, produced of 100 % fungal.

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**Dosage :** 2-8 g/hL. Preventive: 4 g/hL. Treatment: add 6 g/hL and rack off lees after 10 days.

Add 2 g/hL KillBrett every 4 months.

**Application :** full cidermaking process.

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## TANNINS



**The cultivated variety of apples used for cider making determine the aromas, flavors and mouthfeel characters of the final product.** For apples that are lacking in textural tannins or acidity balance, it is possible to help build a great cider especially when dessert apples are used through the addition of certain products. The use of tannins, polysaccharides and yeast derivatives rich in mannoproteins helps to **design the organoleptic profile and balance mouthfeel during fermentation and maturation**.

**Tannins used in cidermaking come from a variety of sources**, including oak, grapes, exotic woods and gall nuts. They have many applications in cidermaking depending on their origin and production method: **anti-oxidant, anti-oxidasic, protein removal, redox potential regulation, reduce green characters perception and reductive notes, increase structure, and balance mouthfeel**.

The tannins Lamothe-Abiet offers for cider can be used **during the fermentation, or after fermentation during maturation up to 48 hours pre-bottling**. Common objectives for tannins when used during fermentation are to **enhance structure and mouthfeel, to protect from browning, and to limit the consequences of mold or rot**.

### TO KNOW

**Finishing agents can be valuable tools for perfecting a cider.** Bench trials are a **very important step to determine the right fit** for any of these products. Finishing aids have been found to help with:

- mask pyrazines/greenness
- maximize fruit
- fill mid-palate
- increase aromatic intensity, perception of sweetness and/or body
- brighten acid
- reduction of sulphur-off compounds
- impart oaky character

*Ask us a sample kit to set up bench trials.*

# FERMENTATION TANNINS

## TANNIN GALLIQUE À L'ALCOOL

Protection from oxidation and mouthfeel enhancement

### BENEFITS

- ◆ Gall nut tannin, used on fruit and juice to protect from browning, and oxidation
- ◆ Help protein stabilisation and clarification

**Dosage :** 0.85-1.6 lbs/1000gal (10-20 g/hL).

**Application :** on apples and juice.

## MATURATION/FINISHING TANNINS

MATURATION TANNINS	COMPOSITION	REDOX POTENTIAL	STRUCTURE	ROUNDNESS	HARMONY	TIMING	DOSAGE g/hL
Vinitan® Advance	100% grape tannins	●	●●●	●●	●●●	Maturation Pre-bottling	5 - 25
Tan&Sense® Volume	Pure ellagitannins of untoasted oak	●●●	●	●●	●●	Maturation Pre-bottling	5 - 20
Tan&Sense® Origin	Pure ellagitanins of lightly toasted oak	●	●	●●●	●●●	Maturation Pre-bottling	5 - 20
Tan&Sense® Expression	Pure ellagitanins of medium toasted oak and grape skin tannins	●	●●	●●●	●●	Maturation Pre-bottling	5 - 20
Tan&Sense® Forte	Pure ellagitannins of toasted oak	●●	●●●	●	●●	Maturation Pre-bottling	3 - 10
Tan'Excellence®	Grape tannins and oak ellagitannins	●●●	●●●		●●	Maturation	10 - 30
Softan® Sweetness	Fresh heated oak tannins bounded to polysaccharides	●●	●●●	●●●	●●●	Maturation	5 - 20
Softan® Power	Proanthocyanidic tannins bounded to polysaccharides	●	●●●	●●●	●●	Maturation	5 - 20
Softan® Finition	Oak tannins bounded to polysaccharides	●●	●●	●●●	●●●	Pre-bottling	5 - 20

# POLYSACCHARIDES



In cidermaking, polysaccharides can be derived either from yeast or plant. They are used to stabilize color, aroma and colloids, extend cider shelf life, increase volume sensation and reduce astringency. The finishing polysaccharides of Lamothe-Abiet offers for cider can be used up to 48 hours pre-bottling with common to enhance and elongate mouthfeel, improve roundness and smoothness.

*Ask us a sample kit to set up bench trials.*

## EXCELGOM

Pure powdered arabic gum from Acacia Seyal for colloidal structure and limpidity

BENEFITS

- ◆ Results from a very strict selection made from the best gums, obtained from an original process developed by our research laboratory
- ◆ Instantly soluble into water or cider and doesn't contain SO<sub>2</sub>
- ◆ Participate to the colloid structure of the cider, preserving its limpidity
- ◆ Improve organoleptic qualities by increasing volume and roundness

**Dosage:** 20-120 g/hL.

**Application:** pre-bottling. **Packaging:** 1 kg.



## MANNO'SENSE®

Formulation of mannoproteins rich in sapid peptides

BENEFITS

- ◆ Natural solution which improves the organoleptic qualities and length of aromas
- ◆ Plays a crucial role in the perception of sweetness
- ◆ Increase roundness and balance to wine
- ◆ Add freshness to the palate

**Dosage :** 50 - 200 mL/hL.

**Application :** pre-bottling, after stabilization.

**Packaging:** 5 L.



# SUBLI'SENSE®

Solution of arabic gum and mannoproteins

BENEFITS

- ◆ Participate to the colloid stability of the cider
- ◆ Preserve cider's limpidity
- ◆ Improve organoleptic qualities by increasing volume and roundness
- ◆ Reduce tannin dryness

**Dosage:** 50 - 200 mL/hL.

**Application:** pre-bottling, after stabilization.

**Packaging:** 5 L, 20 L.

## CIDER STYLE AND GUIDELINES



	FRUITY/TERPENES	FRUITY/TROPICAL	TERROIR	'RESERVE'
<b>Clarification</b>	<b>CEnozym® Clar</b> , 150-300 mL/1000 gal (4-8 mL/hL) <b>Tannin Gallique a l'alcool</b> , 0.8 lbs/1000 gal (10 g/hL) <b>Polymix Natur®</b> , 1.8-3.6 lbs/1000 gal (20-40 g/hL)			
<b>Turbidity</b>	100 NTU	200 NTU	200-250 NTU	250 NTU
<b>Fermentation Temperature</b>	53-57°F	58-62°F	60-64°F	
<b>Yeast</b>	<b>Excellence® STR</b> , 2 lbs/1000 gal (25 g/hL)	<b>Excellence® FTH</b> , 2 lbs/1000 gal (25 g/hL)	<b>Excellence® XR</b> , 2 lbs/1000 gal (25 g/hL)	<b>Excellence® TXL</b> , 2 lbs/1000 gal (25 g/hL)
	<b>Excellence® B-Nature®</b> , 0.8 lb/1000 gal (10 g/hL)	<b>Excellence® B-Nature®</b> , 0.8 lb/1000 gal (10 g/hL)	<b>Excellence® B-Nature®</b> , 0.8 lb/1000 gal (10 g/hL)	<b>Excellence® B-Nature®</b> , 0.8 lb/1000 gal (10 g/hL)
<b>At yeast rehydration</b>	<b>CEnostim®</b> , 2.5 lbs/1000 gal (30 g/hL)			
<b>At inoculation</b>	<b>OptiEsters®</b> , 2.5 lbs/1000 gal (30 g/hL)	<b>OptiThiols®</b> , 2.5 lbs/1000 gal (30 g/hL)	<b>OptiEsters® + OptiThiols®</b> , 1 lb/1000gal (12 g/hL) of each product	<b>OptiEsters® + OptiThiols®</b> , 1.6 lbs/1000 gal (20 g/hL) of each product
	<b>OptiFlore 0®</b> , 2.5 lbs/1000 gal (30 g/hL)			
		<b>CEnozym® Thiols</b> , 230 mL/1000 gal (6 mL/hL)	<b>CEnozym® Thiols</b> , 150 mL/1000 gal (4 mL/hL)	<b>CEnozym® Thiols</b> , 230 mL/1000 gal (6 mL/hL)
<b>1/3 fermentation</b>	<b>OptiFerm®</b> , 2.5 lbs/1000 gal (30 g/hL)			
	<b>Natur'Soft®</b> , 1.6 lbs/1000 gal (20 g/hL)		<b>Natur'Soft®</b> , 2.5 lbs/1000 gal (30 g/hL)	
				<b>Tan&amp;Sense Volume®</b> , 0.4-1.6 lbs/1000 gal (5-20 g/hL)
	<b>CEnozym® FW</b> , 230 g/1000 gal (6 g/hL)		<b>CEnozym® FW</b> , 150 g/1000 gal (4 g/hL)	<b>CEnozym® FW</b> , 230 g/1000 gal (6 g/hL)
	<b>Bentosol Poudre</b>			
<b>MLF if desired</b>			<b>CEno® 1</b> , 1-2 g/hL	
<b>End of AF</b>	$SO_2$ <b>Killbrett®</b> , 0.4 lbs/1000 gal (4 g/hL) <b>Aroma Protect®</b> , 1.8 lbs/1000 gal (20 g/hL)			



## Promote fast and effective clarification

- 1** To **protect from oxidation** and **improve settling and filtration**, add **Tanin Gallique a l'alcool** at 0.8 lb/1000 gal (10 g/hL).
- 2** Use **Enozym® Clar** at 114–230 mL/1000 gal (3-6 mL/hL) in the juice to **improve settling speed and yield**.
- 3** Juice fining with **Polymix® Natur'** (PVPP + bentonite + yeast derivatives) at 1.8 – 3.6 lbs lb/1000 gal (20-40 g/hL) to **eliminate oxidized and oxidable phenolic compounds and improve lees compaction**.

### Turbidity:

100-150 NTU to optimize the production of esters.

200-250 NTU to favor varietal characteristics.

## Alcoholic fermentation: ensure good yeast nutrition

- 1** **Proper yeast rehydration is one of the most important steps to help ensure a strong and healthy fermentation.**

- Suspend 2.5 lbs/1000 gal (30 g/hL) of **EnoStim®** in 20 times its weight of clean, chlorine free, 110°F (43°C) water, to **reinforce yeast activity, limit fermentation risks, reduce H<sub>2</sub>S production and increase aromatic production**.

- Once the temperature of the solution has dropped to 104°F (40°C), add 2 lbs/1000 gal (25 g/hL) of **active dried yeast**. Stir gently to break up any clumps. Let suspension stand for 20 minutes, then stir gently again.

- Slowly add some juice to the yeast suspension to drop temperature of maximum 18°F (10°C). This will help the yeast **adjust to the cooler temperature of the juice** and will help **avoid cold shock caused by a rapid temperature drop**. Wait 20 min. This acclimation step may need repeating for very low temperature juice.

- Add the yeast preparation to the fermentation vessel and mix gently.

2

**Ensure good yeast nutrition and reduce off-flavors production with:**

**Optiflore O®** at 2.5 lbs/1000 gal (30 g/hL) at the beginning of fermentation and **OptiFerm** at 2.5 lbs/1000 gal (30 g/hL) at 1/3 of fermentation.

3

Additions of **natural yeast derivatives** such as **OptiThiols®** and **OptiEsters®**, at the beginning of the fermentation will **boost the aromatic production** and **help defining cider style**.

- To boost esters, fruity, fresh and floral aromas production add **OptiEsters®** at 2.5 lbs/1000 gal (30 g/hL).
- To boost thiolic compounds, citrus, fresh, lime, lemon aromas production and anti-oxidant protection add **OptiThiols®** at 2.5 lbs/1000 gal (30 g/hL).

4

Addition of **Natur'Soft®** at 1.8 lbs/1000 gal (20 g/hL), yeast derivatives rich in mannoproteins, will help with **colloidal stability and mouthfeel**. It provides early polysaccharide availability that can **improve fresh aromas** and **reduce bitter or phenolic characters**.

5

To **stabilize protein**, add at 1/3 fermentation, **Bentosol Poudre** at 1.8-3.6 lbs/1000 gal (20-40 g/hL).

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**Fermentation temperature with aromatic style desired:**

53-57°F to promote fruity, fresh and floral aromas,  
60-65°F to promote 'terroir' and varietal characteristics

**Malolactic Fermentation:**

If MLF is desired, add 1 g/hL of **CEno 1®**, 72 hours after yeast

## Ageing

- Rack 24 hours after fermentation is finished.
- Add SO<sub>2</sub> and **KillBrett®** at 0.4 lb/1000 gal (4 g/hL) to **eliminate any spoilage microbes**.
- Add **Aroma Protect®** at 1.8 lbs/1000 gal (20 g/hL) to **protect from oxidation, maintain cider freshness** during ageing.
- If lees are clean and free from off-odors, you can age cider on lees **to gain texture, complexity and mouthfeel**.
- **Finishing agents** can be valuable tools for **perfecting a cider**. Bench trials are a very important step to determine the right fit for any of these products.

*Ask us a sample kit to set up bench trials.*



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# LAMOTHE - ABIET

## Solutions for winemaking



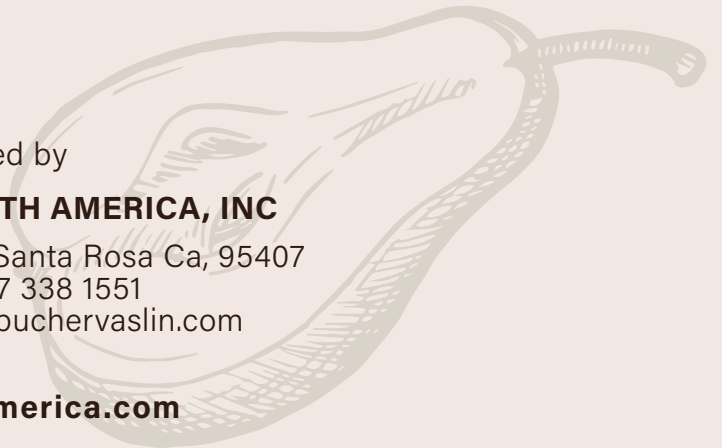
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