



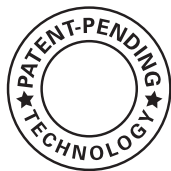
**LalVigne**<sup>TM</sup>  
*Grow your wine*



# From vine to wine

LALVIGNE,  
NATURAL AND INNOVATIVE  
MICROBIOLOGICAL SOLUTIONS FOR  
VITICULTURE AND WINE QUALITY.

[www.lalvigne.com](http://www.lalvigne.com)



With the guarantee and quality of:



LALLEMAND OENOLOGY

Original *by culture*





# Grow your wine

## Microbiological solutions for viticulture

Improve the profitability of your vineyard and the quality of your wine

### **LalVigne is the range of selected vineyard solutions of Lallemand Oenology**

We are pioneers in innovation with research for the benefit of the wine industry.

LalVigne is an extension of the work we have been doing to understand the microbiology of wine.

With LalVigne, we offer you our expertise and experience in microbiology and winemaking for better vineyard management to improve the quality of grapes and wines.

### **From vine to wine**

Our team of microbiologists, agronomists, and winemakers develop **LalVigne** vineyard solutions in collaboration with Universities, Research Centres, winegrowers and wineries worldwide.

We produce and control the quality of all LalVigne products in our own facilities.

### ***Grow Your Wine***



# About us

## Experience

Lallemand was founded at the end of the nineteenth century.

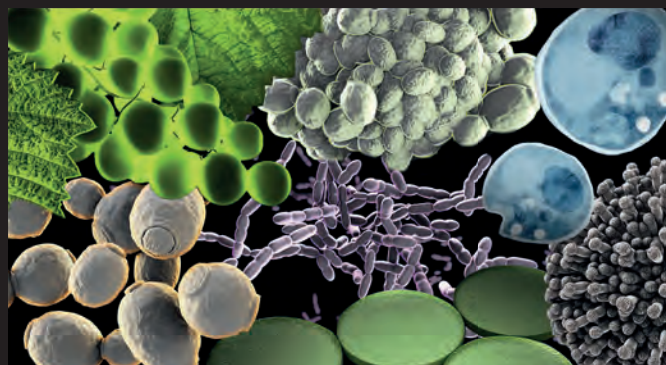
More than 100 years dedicated to provide natural solutions.

## Research and development

In Lallemand we develop biotechnological tools for the viticulture and wine sector. Our R&D department collaborates with Universities and international Research Institutes.

## Quality

We offer traceability and quality assurance. We apply a strict quality policy. All products are subjected to at least 20 rigorous quality tests.



## Specialization in microbiology

Development of natural applications based on microorganisms for viticulture and enology.





## **Global knowledge**

Our team is present in all grape and wine producing regions. We collaborate with the most renowned research centers in Viticulture and Oenology, and with winegrowers and winemakers at an international level.

## **Production**

100% own production.

We produce LaVigne products in our own plants. Production centers in Grenaa (*Denmark*), Montreal (*Canada*), Vienna (*Austria*), Salutaguse (*Estonia*), Verona (*Italy*)...





© LaVigne

**Visionary biological solutions**



# Key developments

● **Late XIX century**  
Lallemand's foundation  
[www.lallemand.com](http://www.lallemand.com)



● **1970's**  
Solutions for oenology  
[www.lallemandwine.com](http://www.lallemandwine.com)

● **2006**   
First research directed towards viticulture

● **2007 - 2010**  
In vitro assays


● **2011**  
First field trials  
*Spain*

● **2012**  
International trials

● **2014**  
Solutions for the viticulture  
Launch in North Hemisphere



● **2016**  
Launch in Southern Hemisphere

● **2017 - Current**   
Contributing to knowledge

● **2021**  
Launch



● **2022**  
Launch





# Facts and figures

## + 25 countries

Different weather, soils, varieties, yields,...

Germany, Australia, Austria, Bulgaria, Chile, Croatia, Slovenia, Spain, France, Greece, Hungary, India, Israel, Italy, Japan, Macedonia, Mexico, New Zealand, Peru, Portugal, Czech Republic, Romania, Russia, Serbia, South Africa, Switzerland, Turkey, Ukraine, United States, Uruguay

## + 70 varieties

Albariño, Sauvignon Blanc, Chardonnay, Riesling, Airén, Verdejo, Godello, Treixadura, Glera, Macabeo, Grüner Veltliner, Viognier, Pinot Gris, Sylvaner, Tempranillo, Cabernet Sauvignon, Merlot, Syrah, Pinot Noir, Cabernet Franc, Carmenere, Petit Verdot, Grenache, Bobal, Monastrell, Pinotage...

## + 35 scientific papers

American Society of Enology and Viticulture (ASEV, USA), International Organization of Vine and Wine (OIV), Macrowine, South African Journal of Enology and Viticulture (SAJEV, South Africa), Food & Chemistry, International Organization of Vine and Wine (OIV)...



No residual limits. No safety time limit





## News

🌿 LalVigne™  
**RESILIENS™**

*Balance abiotic stress*

Protects vineyards against  
abiotic stresses



🌿 LalVigne™  
**CICATRIX™**

*Hail damage recovery*

Natural solution  
after hail



🌿 LalVigne™  
**PROHYDRO™**

*Water stress management*

Improves adaptation  
and resistance of grapevine  
to water stress



🌿 LalVigne™  
**BOTRYLESS™**

*Natural botrytis defense*

Natural solution for  
Botrytis control





# Application Timing



Eichhorn-Lorenz	4	12	19
BBCH	9	51	61
Baggiolini	C	G-H	

LaVigne  
**CICATRIX**  
Hail damage recovery



LaVigne  
**RESILIENS**  
Balance abiotic stress



LaVigne  
**PROHYDRO**  
Water stress management



LaVigne  
**BOTRYLESS**  
Natural botrytis defense



LaVigne  
**AROMA**  
Elevate aroma precursors



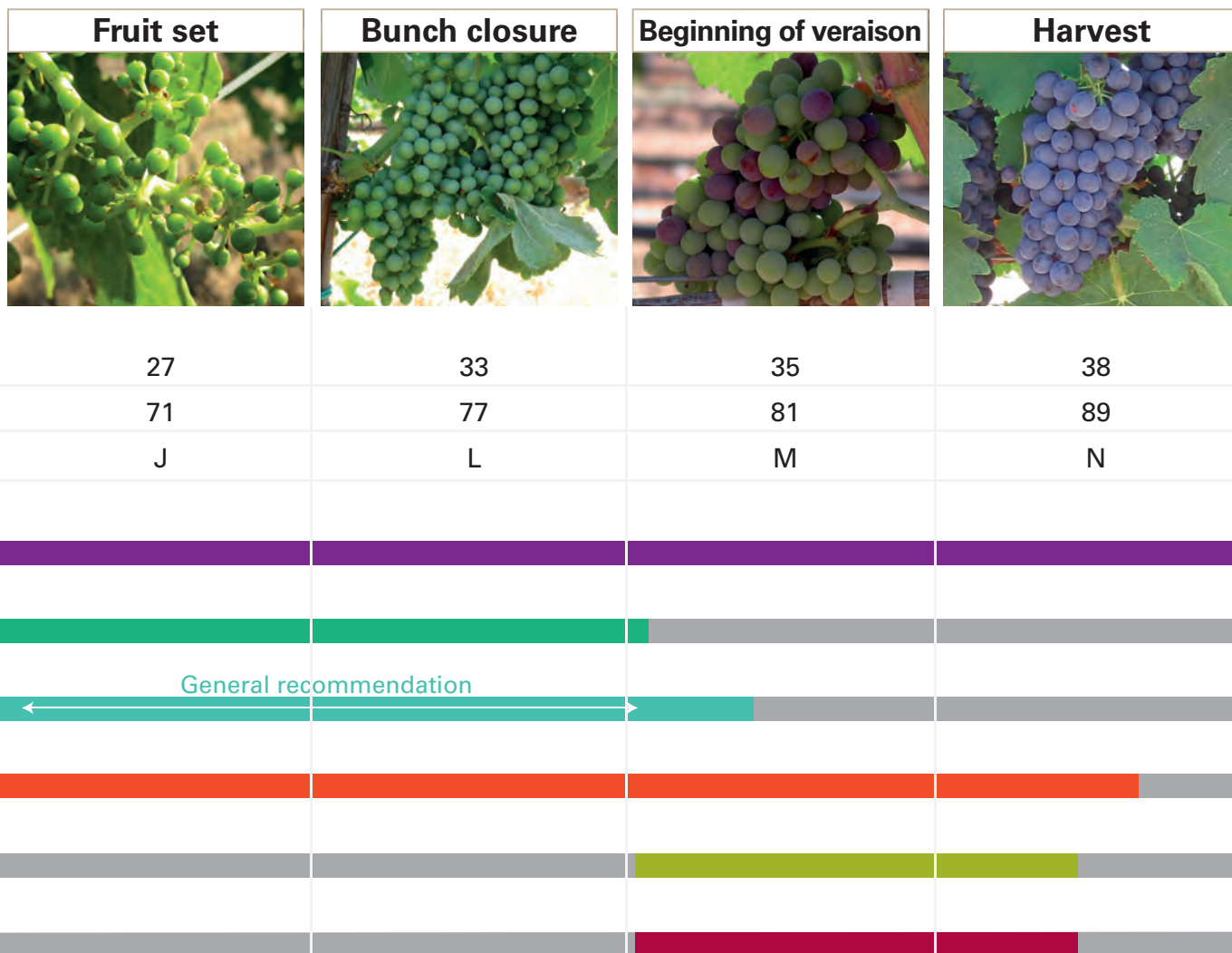
LaVigne  
**MATURE**  
Advance phenolic maturity



- **LaVigne CICATRIX:** After hail damage. 1-3 applications every 10-14 days
- **LaVigne RESILIENS:** Abiotic stress resistance. General recommendation between 4-6 inch shoots and beginning of flowering. Number of applications:  $\geq 1$  (1-3 usual; no maximum limit). Applications every 10-14 days. Effective from the first application.
- **LaVigne PROHYDRO:** Water stress resistance. General recommendation between fruit set and bunch closure. Number of applications:  $\geq 1$  (1-3 usual; no maximum limit). Applications every 10-14 days. Effective from the first application.







- LaVigne BOTRYLESS: Prevention of Botrytis. From flowering to ripening
- LaVigne AROMA: Increases accumulation of aromatic precursors. Beginning of veraison + 7-14 days
- LaVigne MATURE: Increases phenolic maturity. Beginning of veraison + 7-14 days





Protects vineyards against  
abiotic stresses



**ENDURANCE**

Reduces negative impact of abiotic stress in the vineyard

**EFFICIENCY**

Increases physiological activity, increases photosynthesis, improves water potential and microclimate of the bunch

**RECOVERY**

Promotes the recovery of the vineyard after episodes of abiotic stress

**PERFORMANCE**

Increases performance. Reduces fruit set problems associated with unfavorable environmental conditions

**QUALITY**

Improves the quality and balance of the grape by achieving a better leaf/fruit balance for a more balanced maturity

**RESILIENCE**

Prevents the effects of climate change and global warming on the vine: Prevents abiotic stress



## BENEFITS

**Increases the adaptive capacity of the vine with positive results in adverse situations.**

*Natural treatment that reduces the negative impact that abiotic stress conditions can have on the vineyard*

*Increases yield*

*Improves the quality and balance of grapes*

*Increases the physiological activity of the plant*

*Improves leaf water potential values*

*Prevents stress caused by extreme temperatures, UV radiation, salinity, drought, wind and limits the effects of heat waves*

*Favors vineyard recovery after frost episodes*

*Improves bunch microclimate conditions*

*Reduces problems associated with abiotic stresses on wine quality and winemaking process*

## CHARACTERISTICS

Product for foliar application.

### Composition

Oenological yeast derivative (*Saccharomyces cerevisiae*) from Lallemand Oenology.

Non GMO.

### Packaging

10 kg carton containing 10 bags of 1 kg.

### Storage

Non-flammable product.

Store in sealed original packaging. Store preferably in a cool and dry place. Avoid extreme storage condition.

## DOSE AND APPLICATION

It is recommended to start applications preventively before the onset of conditions that may cause abiotic stress in the vineyard.

Recommended application rate on vines 0,5 kg/ha.

Effective beginning at the first application.

It is recommended to start the application once the shoots reach a size of 10 to 20 cm and to maintain applications at intervals of about 14 days during the vegetative growth phase of the vineyard.

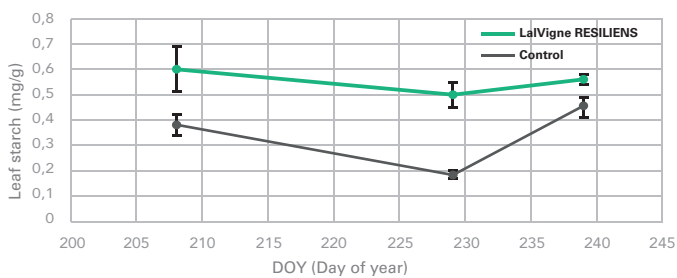
Interval between applications around 14 days.

If LalVigne RESILIENS has not been applied preventively, it can be used once stressful situations occur to promote plant recovery.

Foliar application.

Dilute in water for its application (approximately 100 - 1000 L / ha; 10 - 110 gal / acre).

Follow the instructions on the application protocol and recommended crops.



This graph, results of a test carried out by the Catholic University of Piacenza (Italy), shows how the vines treated with LalVigne RESILIENS had significantly higher levels of starch in the leaves than the untreated control. Starch is a primary product of photosynthesis and it is stored in the leaf chloroplasts during the day and is used during the night to support respiration, leaf metabolism and growth. Higher starch concentration is linked to higher leaf photosynthetic rates and contributes to ameliorate vine carbon balance when assimilation rates are limited by environmental factors.



Improves adaptation  
and resistance of  
grapevines to water stress



#### **ADAPTATION**

Improves grapevine adaptation and resistance to water stress

#### **PERFORMANCE**

Reduces berry weight losses caused by high temperatures and lack of water

#### **PROTECTION**

The proline present in its composition acts as an osmoprotector balancing the cellular water

#### **WATER USE**

Increases physiological activity, photosynthesis rate, water use efficiency (WUE) and chlorophyll level

#### **ELASTICITY**

Greater elasticity of the tissues, allowing greater recovery after episodes of hydric stress

#### **BUNCH MICROCLIMATE**

Better thermoregulation of the plant, reducing the temperature and the level of sunburn in the bunches

#### **QUALITY**

Reduces imbalances due to water stress and physiological stoppage in maturation, maintaining the typicity of the wines



## BENEFITS

It naturally improves the vine tolerance to water stress.

Increases yield

Improves the quality and balance of the grape

Preserves or recovers the typicity of the wine

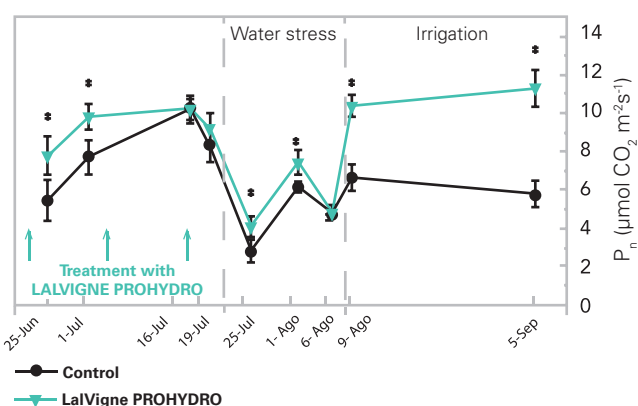
Increased physiological activity of the plant

Improves values of leaf water potential

Maintains greater tissue elasticity, which allows for greater vine recovery after episodes of water stress

Reduces the level of sunburn in bunches

Increased chlorophyll level in leaves



Level of photosynthesis in vines treated with LalVigne PROHYDRO versus untreated vines. P<sub>n</sub> (µmol CO<sub>2</sub> m<sup>-2</sup>s<sup>-1</sup>)

In the above graph from a trial carried out by the University of Perugia (Italy), in controlled vines subjected to severe water stress between 20 June and 8 August, it was observed that the application of **LalVigne PROHYDRO**, already from the first application, had a positive effect on the physiological activity of the plant, increasing its level of photosynthesis. This positive effect is maintained during the period of greatest water deficit increasing significantly once the water stress ceases, demonstrating that the plant treated with **LalVigne PROHYDRO** recovers in a more effective due thanks to the greater elasticity of its tissues.

## CHARACTERISTICS

Product for foliar application.

### Composition

Oenological yeast derivative (*Saccharomyces cerevisiae*) from Lallemand Oenology, L-Proline (*Corynebacterium glutamicum*).

NON GMO.

### Packaging

10 kg carton containing 10 bags of 1 kg.

### Storage

Non-flammable product.

Store in sealed original packaging. Store preferably in a cool and dry place. Avoid extreme storage conditions.

## DOSE AND APPLICATION

It is recommended to start preventive applications before the onset of conditions that may cause water stress in the vineyard.

**Recommended dose by application on vines:** 1 kg/ha.

1<sup>st</sup> application: prior to stressful conditions.  
Effective from the first application.

Situations of severe post-bloom stress (3 applications at the phenological stages JKL according to M. Baggiolini)

1<sup>st</sup> application: STATE J. Fruitset

2<sup>nd</sup> application: STATE K. Pea size

3<sup>rd</sup> application: STATE L. Bunch closure

Interval between applications around 14 days.

In case the water stress appears before flowering, it is recommended to start the treatment earlier and increase the number of applications up to 4 or 5.

Foliar application.

Dilute in water its application (approximately 100 - 1000 L / ha; 10 - 110 gal / acre).

Follow the instructions on the application method and recommended crops.





**Natural solution  
after hail**

**BEFORE**



**AFTER**

**LalVigne™**  
**CICATRIX™**  
*Hail damage recovery*



**RECOVERY**

Natural treatment that accelerates the recovery of vines that have suffered hail damage

**PERFORMANCE**

Increases yield, reducing losses caused by hail. In previous experiences recoveries  $\geq 10\%$

**EFFICIENCY**

Increases physiological activity, increases the rate of photosynthesis

**HEALING**

Helps the plant in the containment of areas injured by hail

**UNIFORMITY**

Greater uniformity of the clusters, more balanced maturation, favoring a better quality of the wine

**COST EFFECTIVENESS**

Improves profitability for the winegrower by increasing the recovery of the vineyard and its productive potential



## BENEFITS

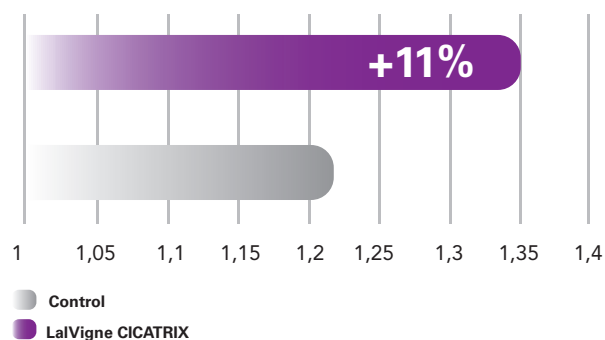
**Increases yield, reducing losses caused by hail. In previous experiences increases  $\geq 10\%$**

Natural treatment that accelerates the recovery of vines that have suffered hail damages.

Increases the physiological activity of the plant for a greater and faster recovery.

Increases the homogeneity of the bunches, balancing their development and ripening level.

Improves the balance in the grape components impacting on a higher wine quality.



### Increase in yield (kg/vine) in a Tempranillo vineyard affected by hail.

*This trial was carried out by Itacyl in the frame of the Freshwines project, led by Lallemant Oenology, financed by CDTI with ERDF (European Regional Development Fund) funds.*



Hailstorms can cause damage that significantly reduces the yield of a vineyard and therefore the profitability for the winegrower.

## CHARACTERISTICS

Product for foliar application.

### Composition

Oenological yeast derivative (*Saccharomyces cerevisiae*) from Lallemant Oenology.

NON GMO.

### Packaging

10 kg carton containing 10 bags of 1 kg.

### Storage

Non-flammable product.

Store in sealed original packaging. Store preferably in a cool and dry place. Avoid extreme storage conditions.

## DOSE AND APPLICATION

Effective from the first application.

Product for foliar application. Apply as soon as possible after hail damage.

**Recommended dose by application on vines: 1 kg/ha.**

1<sup>st</sup> application: after hail damage as long as there are enough leaves to receive the foliar application. In case the hail eliminates the entire leaf surface, make this first application once the new shoots present at least 3-4 leaves.

As a general recommendation 2 to 3 applications are advised in order to increase vine recovery and yield. Interval between applications around 14 days.

Dilute in water for its application (approximately 100 - 1000 L / ha; 10 - 110 gal / acre).

Follow the instructions on the application method and recommended crops.



Natural solution for  
*Botrytis* control



**ACTIVATION:** Activates the natural defenses of the plant

**PROTECTION:** Prevents the growth of the fungus, limiting the spread of the *Botrytis cinerea* infection

**PROFITABILITY:** In the event of a Botrytis attack, it improves the health of the bunches, allowing a better selling price for the grapes and therefore greater profitability.

**QUALITY:** By reducing the Botrytis infection, the gluconic level decreases producing higher quality grapes and resulting wines.

**YIELD:** Reduces yield losses due to Botrytis attack during the maturation phase

**SAFETY:** It does not cause any type of residue problem on the grape and does not interfere with the fermentation of the musts.

**EFFECTIVENESS:** fungal origin that guarantees greater recognition by the plant



## BENEFITS

### Natural solution for Botrytis control

Inhibits the growth of Botrytis

Strengthens the natural defense of the vine

Reduces yield and quality losses associated with Botrytis

No safety period or maximum residue limit

Fungal origin: higher efficacy, better plant recognition

No negative impact on winemaking process

Healthier grapes, healthier wines

No resistance risk, offers an alternative or organic-based complement to agents with resistance risk, especially at short spray intervals



If the previous year's infection pressure was high, it is important to start preventive treatments well in advance in the new season when favorable conditions for the fungus appear. In climatic conditions favorable to Botrytis, treatments should begin before bunch closure.

## CHARACTERISTICS

Product for foliar application.

### Composition

100% fungal chitosan (*Aspergillus niger*).  
NON GMO.

### Packaging

1 kg bags.

### Storage

Non-flammable product.  
Store in sealed original packaging.  
Store preferably in a cool and dry place.  
Avoid extreme storage conditions.

### Basic substance

Product authorized as basic substance according to Regulation (EC) No 1107/2009.

## DOSE AND APPLICATION

Time of application: the usual for antibotrytis treatments. From flowering to fruit set. It is recommended to apply before bunch closure.  
Preventive use: 200-400 g/ha (100 g/hL).  
Conditions of high risk of *Botrytis* development and/or curative use: 500-600 g/ha.

Effective from the first application.

### N° of applications: $\geq 1$ (1-3 usual - Max 8).

It is recommended to direct the application to the bunch area.

### Interval between applications: 14 days.

Direct the application to the cluster area.

Dilute in water its application (200 – 600 L / ha).

To improve its dilution, prepare in water with  $\text{pH} \leq 5$

Follow the instructions on the application method and recommended crops.



Enhance the flavor of your wine,  
increasing the concentration  
in aroma precursors  
of your grapes



**SKIN THICKNESS**

Increased berry skin thickness  
*Giacosa et al., 2016*

**AROMA PRECURSORS**

Increased varietal aroma compounds  
*Tomasi et al., 2017*

**RESPECT**

Without impact of berry weight, Brix, pH,  
or TA  
*Téllez et al., 2015*

**GLUTATHIONE**

Increased concentration of GSH  
*Šuklje et al., 2016*

**THIOLS**

In thiolic varieties: increased 3MH and  
3MHA in wines  
*Suklje et al., 2016*

**BALANCE**

Reduction of herbaceous / aggressive character  
*Tomasi et al., 2017*

**STABILITY**

Higher stability of aroma compounds  
*Suklje et al., 2016*



## BENEFITS

Free amino acids and Glutathione play a crucial role in the development and stability of wine aromatic potential. **LalVigne AROMA** has a positive impact on the concentration of free amino acids and reduced Glutathione, as demonstrated by the analyses carried out on grapes from trials conducted.

Greater uniformity of veraison

Improved ripening uniformity

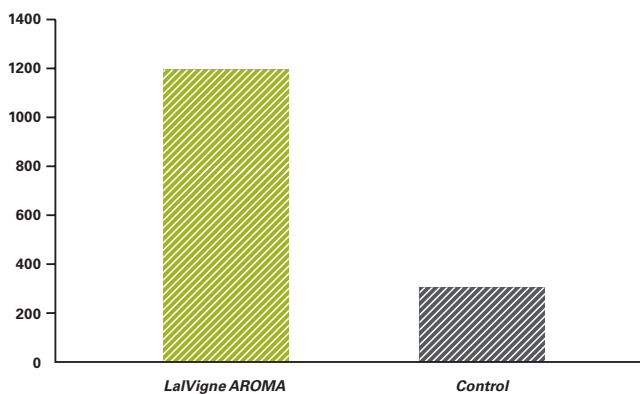
Increased grape and wine quality

Increase in the proportion of free run must and at low pressures

### Sauvignon Blanc grapes at harvest, Spain 2013

Grapes at harvest time

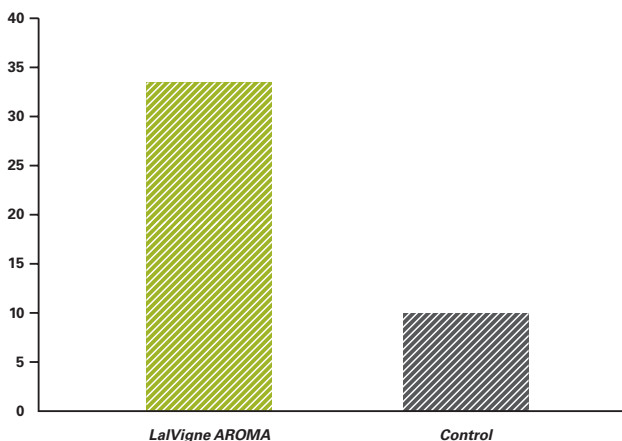
Total concentration of free amino acids (mg/L)



### Sauvignon Blanc grapes at harvest, Spain 2013

Grapes at harvest time

Concentration of reduced GSH (mg/L)



## CHARACTERISTICS

Foliar application product.

### Composition

100% specific fractions of inactivated wine yeast, *Saccharomyces cerevisiae*.

It is non-pathogenic, non-hazardous, food grade and non-GMO.

### Packaging

1 hectare (2.5 acres) carton:

Each box contains two 3 kg bags (6 kg total)

### Storage

Non-flammable product.

Store in sealed original packaging.

Store preferably in a cool, dry place.

Avoid extreme storage conditions.

## DOSE AND TREATMENT

1 Treatment = 2 applications.

### Recommended dose by application on vines

3 kg / ha (6.6 lb / 2.5 acre).

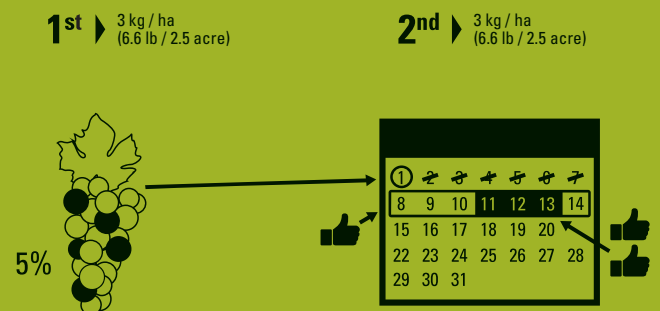
1<sup>st</sup> Application = beginning of veraison (around 5%).

2<sup>nd</sup> Application = 7 - 14 days after 1st application (best 10 - 12 days).

Foliar spraying application.

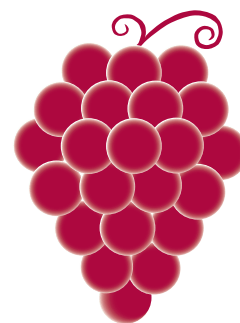
Dilute in water before applying (around 200 - 600 L / ha ; 50 - 160 gal / 2.5 acre).

Follow application recommendations.





**Increased and advanced phenolic maturity**



**SKIN THICKNESS**

Increased berry skin thickness with higher extractability of anthocyanins

**RESPECT**

Without impact on berry weight, Brix, pH, TA  
*González et al., 2016*

**BALANCE**

Reduction of herbaceous / aggressive character  
*Tomasi et al., 2017*

**ANTHOCYANINS**

Increases concentration of extractable anthocyanins  
*Villangó et al., 2015*

**TANNIN**

Increases skin tannins  
*Lissarrague et al., 2014*

**QUALITY**

Increased degree of polymerization  
*Villangó et al., 2015*

## BENEFITS

**LalVigne MATURE** stimulates the vine, which responds by increasing and accelerating the synthesis of secondary metabolites positive for wine quality, contributing to an improvement in phenolic maturity.

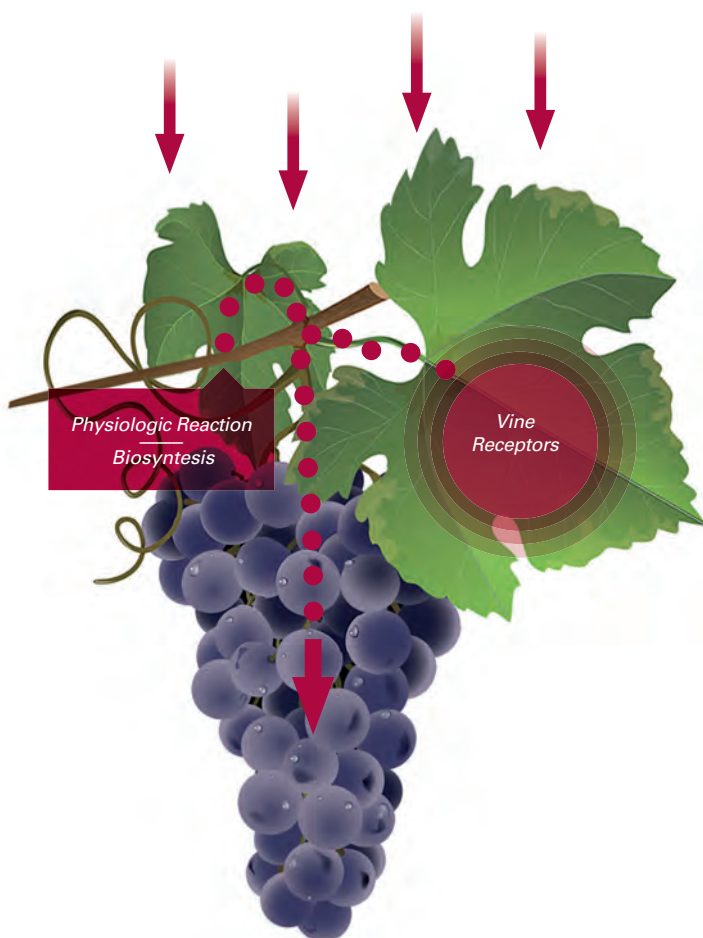
Increased grape and wine quality

Greater uniformity of veraison

Improved ripening uniformity

Reduction of pyrazines and green character

Increasing and advancing phenolic maturity



## CHARACTERISTICS

Foliar application product.

### Composition

100% specific fractions of inactivated wine yeast, *Saccharomyces cerevisiae*.

It is non-pathogenic, non-hazardous, food grade and non-GMO.

### Packaging

3 hectares (7.5 acres) carton: 3 separate boxes.  
Each box contains two 1 kg bags (6 kg total).

1 hectare (2.5 acres) carton:

Each box contains two 1 kg bags (2 kg total).

### Storage

Non-flammable product.

Store in sealed original packaging.

Store preferably in a cool, dry place.

Avoid extreme storage conditions.

## DOSE AND TREATMENT

1 Treatment = 2 applications.

### Recommended dose by application on vines

1 kg / ha (2.2 lb / 2.5 acre).

1<sup>st</sup> Application = beginning of veraison (around 5%).

2<sup>nd</sup> Application = 7 - 14 days after 1<sup>st</sup> application (best 10 - 12 days).

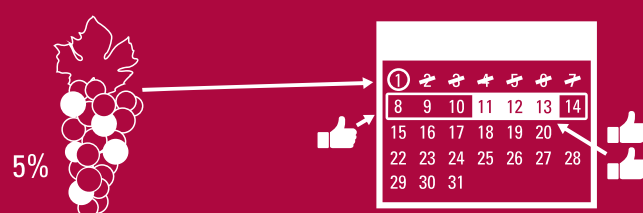
Foliar spraying application.

Dilute in water before applying (around 200 - 600 L / ha ;  
50 - 160 gal / 2.5 acre).

Follow application recommendations.

1<sup>st</sup> ▶ 1 kg / ha  
(2.2 lb / 2.5 acre)

2<sup>nd</sup> ▶ 1 kg / ha  
(2.2 lb / 2.5 acre)





# Advantages for viticulture

## **COST EFFECTIVENESS**

Reduces losses caused by adverse weather events including yield losses due to berry dehydration.

## **PERFORMANCE**

Greater elasticity of the tissues allows a greater and faster recovery of the vines.

## **PROTECTION**

It favors the adaptation to adverse situations maintaining a greater activity of the plant. Greater resilience and adaptation to adverse conditions throughout the season.

## **NATURAL**

All LalVigne products are of 100% natural origin.

## **UNIFORMITY**

Increases harvest quality due to a more balanced maturation of the grapes, allowing for a more optimal harvest timing.

# Advantages for oenology

## **WINE IMPROVEMENT**

Improves the quality of grapes and wine.

More balanced maturation, more balanced wines, concentrated, complex and less aggressive on the palate

## **SAVINGS**

Less need for oenological inputs.

Reduces processing costs and fermentation problems associated with unbalanced or overripe grapes

## **RESPECT**

Increase in varietal typicity of the wines, and express the individuality of the site.

## **LONGEVITY**

Increases the longevity of wines, greater stability of aromas, lower risks of oxidation and volatile acidity

## **COST EFFECTIVENESS**

Increases the volume of wine by reducing losses of grape production caused by situations of unwanted stress in the vineyard

## **SECURITY**

Products without residue problems in wine



# Committed to wine from the vineyard

Wine is influenced by factors linked to viticulture, winemaking and consumer tastes. Wineries that are able to manage these factors achieve a competitive advantage in the market.

The **LalVigne** project grows thanks to our collaboration with universities, institutes, wineries, grape growers and winemakers from different countries.



**The LalVigne products** have been tested through scientific, monitored and observational studies, which have shown the effect of their application in the vineyard, on the grape and in the wine.

### **Visionary biological solutions**

Being original is key to your success. At Lallemand Oenology, we apply our passion for innovation, maximize our skill in production and share our expertise, to select and develop natural microbiological solutions. Dedicated to the individuality of your wine, we support your originality, we cultivate our own.