Improve ripening from veraison
Improve ripening from veraison for vinegrowers and winemakers.

- Uniform veraison
- Homogeneous maturation
- Improve your grapes
- Reduce risks
- Improve your wines

Profitability
Security
Natural
Innovation
Organic Agriculture

LalVigne™
Grow your wine

Reduce risks, improve your wines.
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.

Production
100% own production.
We produce LalVigne™ MATURE and LalVigne™ AROMA in our own production plants.
Production centers in Grenaa (Denmark), Montreal (Canada), Vienna (Austria), Salutaguse (Estonia), Verona (Italy)…
Key dates

Lallemand’s foundation
www.lallemand.com

Late XIX century

1970’s
Solutions for oenology
www.lallemandwine.com

2006
First research directed towards viticulture

2017 - current
Lallemand Academy
Contributing to knowledge

2016
Launch in Southern Hemisphere

2014
Solutions for the viticulture
Launch in North Hemisphere
2007 - 2010
In vitro assays

2011
First field trials
Spain

2012
International trials

2013
Patent request (PCT) in USA
Facts and figures

+ 25 countries
Different weather, soils, varieties, yield, ...

+ 70 varieties
Albariño, Sauvignon Blanc, Chardonnay, Riesling, Airen, 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...

No residual limits. No safety time limit
Improve ripening from veraison
Foliar application

100% specific fractions of selected inactivated yeast
*Saccharomyces cerevisiae*, non GMO.
**Increased varietal aroma compounds**
Tomasi et al. 2017

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

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

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

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

**Increased and advanced accumulation of aroma precursors**
Characteristics

Composition
100% specific fractions of selected inactivated yeast.
_Saccharomyces cerevisiae_.
Non GMO.

Packaging
1 hectare (2.5 acres) carton
Each box contains 2x3 kg bags for two applications.
Total weight: 6 kg.

Storage
Non-flammable product.
Store in sealed original packaging.
Avoid extreme storage conditions.

Organic Agriculture
Product suitable in organic farming according to CE n°834/2007 and 889/2008 regulation.
Product compliant under NOP Controlled by ECOCERT SA F – 32600

Dose
1 treatment = 2 applications
Recommended dose by application on vines
3 kg / ha (6.6 lb / 2.5 acre)

Foliar application

1º Application = beginning of veraison
2º Application = 7 - 14 days after 1º application (best 10-12 days)

Suspend LalVigne™ AROMA in approximately 10 times its weight in water in order to get a perfect dissolution.

Dilute in water for its application
Keep the agitator running during the application

Avoid leakage losses

LalVigne™ Preparation & Application
Increased and advanced phenolic maturity

**SKIN THICKNESS**
Increased berry skin thickness with higher extractability of anthocyanins
*Rio Segade et al. 2016*

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

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

**TANNIN**
Increases skin tannins
*Lissarrague et al. 2014*

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

**QUALITY**
Increased degree of polymerization
*Villangó et al. 2015*
Characteristics

Composition
100% specific fractions of selected inactivated yeast. *Saccharomyces cerevisiae.* Non GMO.

Packaging
3 hectares (7.5 acres) carton: contains 3 separate boxes.
Each box contains 2x1 kg bags for 1 ha (2.5 acres) Total weight: 6 kg.
1 hectare (2.5 acres) carton: contains 2x1 kg (2.2lb) bags for two applications.
Total weight: 2 kg.

Storage
Non-flammable product.
Store in sealed original packaging.
Avoid extreme storage conditions.

Organic Agriculture
Product suitable in organic farming according to CE n°834/2007 and 889/2008 regulation.
Product compliant under NOP Controlled by ECOCERT SA F – 32600

Dose
1 treatment = 2 applications
Recommended dose by application on vines
1 kg / ha (2.2 lb / 2.5 acre).

Foliar application

1ª Application = beginning of veraison
2ª Application = 7 - 14 days after 1ª application (best 10-12 days).

Suspend LalVigne™ MATURE en in approximately 10 times its weight in water and stir/agitate to mix.

Dilute in water for its application
Keep the agitator running during the application.

Avoid leakage losses.
Uniform veraison

LalVigne™ MATURE Time Lapse (English).

Visit the explanatory Time Lapse video of the veraison on the Lallemand Oenology Channel on YouTube.
Cabernet Sauvignon, Ribera del Duero, Spain. 2016

Vines treated with LalVigne™ MATURE reached 100% veraison 7 days before the control vines.
Mode of action

RECOGNITION
Recognition by plant receptors

ACTIVATION
Plant respond activation

SECONDARY METABOLISM
Stimulation of genes involved in the synthesis of secondary metabolites

GRAPE IMPROVEMENT
Increased berry skin thickness
Positive compounds extractability

WINE IMPROVEMENT
More balanced wines
Impact of LalVigne™ MATURE on the expression of genes directly involved with the synthesis of anthocyanins

This graph shows the expression of the UFGT gene (flavonoid 3 O-glucosyltransferase) during the grape’s maturation phase, comparing an untreated control versus the treatment with LalVigne MATURE in two moments of application (LVM A1 and LVM A2). This gene is directly related to the synthesis of phenolic compounds such as anthocyanins.

Increased skin thickness

It can be observed in the graph the significant increase achieved with the application of LalVigne™ AROMA and LalVigne™ MATURE on the berry skin thickness.

In this study carried out at the University of Turin, the improvement obtained in different varieties with the different treatments is shown.

Foliar spray application of specific inactive dry yeast at veraison: effect on berry skin thickness, aroma and phenolic quality. Giacosa et al. 2016
Advantages for the viticulture

PROTECTION
Increase berry skin thickness
Lower berry break in the case of mechanical harvesting

SAFETY
Advanced phenolic maturity and aroma precursors
Possibility of advancing harvest
Reduce risks associated with late harvests (rainfall, frost)

HOMOGENEITY
Facilitates the decision of the optimal moment of harvest
Reduces heterogeneity after weather incidents (frost, hail...)

ECOLOGIC
Authorized in organic viticulture

PROFITABILITY
Complementary or alternative to cluster thinning and other canopy management practices
More balance grapes
It allows to advance harvest and also reducing the loss of yield due to dehydration
**Advantages for the oenology**

- **INCREASE**
  - Grapes balance
  - Skin compounds (anthocyanins, skin tannins...)
  - Aroma precursors
  - Glutathione (GSH)

- **REDUCE**
  - Less herbaceous / vegetable character of the grapes and wine
  - Reduces wine aggressiveness in mouthfeel

- **SAVING**
  - Less need for oenological inputs (example, addition of skin tannin)

- **EASINESS**
  - Optimize maceration
  - Fast release of compounds
  - Reduces fermentation risks associated with excessively mature grapes

- **WINE IMPROVEMENT**
  - More balanced wine, concentrated and complex
  - Allows the production of lower alcohol wines

- **RESPECT**
  - Wines that convey the differentiation provided for each plot, for each origin

- **LONGEVITY**
  - Higher wine aromas stability
LalVigne™ experiences

Christian Roguenant.
Enólogo. Baileyana Winery,
Paso Robles, California, USA:

“After hearing about LalVigne in 2014, we decided (with the cooperation of Scott Williams of Pacific Vineyard Co.) to test the products in two blocks. We use LalVigne™ AROMA on White Grenache and LalVigne™ MATURE on Syrah.
We observed an earlier maturity in the treated area compared to the control and a higher level of polyphenols in the finished wines.

The chemical analysis was very similar, however, the wines showed great differences in the sensory analysis. Both on White Grenache and on Syrah, we preferred treated wines that presented more concentration and better maturity. Improved fruity taste and mouthfeel. In the treated Syrah block we noticed a greater complexity and a better balance acidity / tannin. In the 2015 vintage we saw similar results in other treated blocks and we decided to extend the treatments to other varieties”.

Jordan Harris.
Tarara Vineyards, Leesburg
Virginia, USA:

“In our experience, we have repeatedly seen a great increase in quality through sensory analysis with LalVigne™”

Joe Wright.
Winemaker. Left Coast Cellars,
Oregon, USA:

“We observed the effectiveness of LalVigne™ MATURE in our experimental plot from the week after the first application. At harvest the lignification of the bunch stem increased, advanced the maturity of the seed, the grape had more color and was more ripen. I preferred the treated blocks over the controls in cold years as well as in warmer years”
“keeping the natural acidity in the vineyard can be a challenge in Texas and other hot climate winemaking regions around the US. Our most challenging grape to ripen is Mourvedre. It is a late bud breaking grape which is great to avoid the spring freezes that hit Texas regularly.

The downside with Mourvedre is our hot climate during the growing season. We tend to have high pH wines with low Brix grapes at harvest. Our vineyard site is not conducive to making a red wine from our Mourvedre grapes. Years ago, I decided to make dry rosé from this block. We were still getting high pH and low Brix fruit.

In 2016, I sprayed with LalVigne™ MATURE. The results were amazing. We harvested the treated block 20 days earlier than the control block. They both had the same Brix when each block was harvested, but the pH was so much lower from the grapes treated with LalVigne™ MATURE. We will spray both blocks of Mourvedre this year (2017) with LalVigne™ MATURE and in the future.”

“During the very dry and early harvest of 2016 it became evident that many of the more aromatic cultivars such as Sauvignon Blanc would struggle to produce wines with true varietal character in South Africa. In the Daschbosch cellar of Uniwin in the Breedekloof Valley we decided to apply LalVigne™ AROMA at veraison on a large block with a control to attempt to achieve Sauvignon Blanc with more aromatic intensity in these hard conditions. In the blending sessions that followed the treated wine stood out with more aromatic intensity and varietal character in a tasting session of over 30 Sauvignon Blancs.”
**Frequently asked questions (I)**

What differentiates LalVigne™ MATURE from LalVigne™ AROMA?

<table>
<thead>
<tr>
<th></th>
<th>LalVigne™ Aroma</th>
<th>LalVigne™ Mature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased and advanced accumulation of aroma precursors</td>
<td>++++</td>
<td>++</td>
</tr>
<tr>
<td>Increased and advanced of phenolic maturity</td>
<td>++</td>
<td>++++</td>
</tr>
<tr>
<td>Vine recognition</td>
<td>LalVigne™ Aroma Increases 100%</td>
<td>LalVigne™ Mature Increases 100%</td>
</tr>
<tr>
<td>Skin thickness</td>
<td>LalVigne™ Aroma Increases 100%</td>
<td>LalVigne™ Mature Increases 100%</td>
</tr>
<tr>
<td>Specific inactivated yeast</td>
<td>LalVigne™ Aroma Natural NO GMO</td>
<td>LalVigne™ Mature Natural NO GMO</td>
</tr>
<tr>
<td>Non GMO</td>
<td>LalVigne™ Aroma A</td>
<td>LalVigne™ Mature B</td>
</tr>
<tr>
<td>Composition</td>
<td>LalVigne™ Aroma</td>
<td>LalVigne™ Mature</td>
</tr>
<tr>
<td>Dose</td>
<td>2 x 3 Kg/ha</td>
<td>2 x 1 Kg/ha</td>
</tr>
<tr>
<td>Timing of application</td>
<td>LalVigne™ Aroma Start veraison and 7-14 days later</td>
<td>LalVigne™ Mature Start veraison and 7-14 days later</td>
</tr>
</tbody>
</table>

Could you make a double dose application instead of two with the recommended dose?

Our recommendation is based on the results of scientific and technical trials made. To get the best effectiveness, follow the recommendations.

How much water should I use to make the application of LalVigne™ products?

Dilute the product in about 10 times its weight in water to put in suspension. Add to the tank of the spray machine with the minimum amount of water that allows to perform a homogeneous spray, avoiding excess of water that can cause loss of product by dripping. Water acts as the treatment vehicle, what is important is the dose of the product used.
At what point should I do the treatment?
And in my case...?

In case of not mixing, but the treatment with another product is going to be done right away, what recommendation should I follow?

Apply first LalVigne™ AROMA and/or LalVigne™ MATURE.

Wait 48 H.
Apply the other product.

Can I mix LalVigne with other products?
You can mix LalVigne™ AROMA and LalVigne™ MATURE.

Avoid mixing when possible
Do not mix with oils, alkaline products and lime sulfur solutions.
No incompatibilities with other products were found. In case of mix, check the recommendations of the other product used and perform phytotoxicity test.

Real cases

<table>
<thead>
<tr>
<th>% veraison</th>
<th>1st application</th>
<th>2nd application</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5%</td>
<td>&lt; 5%</td>
<td>+12/14 days after first application</td>
</tr>
<tr>
<td>5-30%</td>
<td>5-30%</td>
<td>Recommendation 7-14 days after the 1st.</td>
</tr>
<tr>
<td>30-50%</td>
<td>30-50%</td>
<td>Optimum 10-12 days after the 1st.</td>
</tr>
<tr>
<td>50-70%</td>
<td>50-70%</td>
<td>7 Days after the 1st</td>
</tr>
<tr>
<td>70%</td>
<td>Make only first application</td>
<td>Do not make 2nd application</td>
</tr>
</tbody>
</table>

In case of not mixing, but the treatment with another product is going to be done right away, what recommendation should I follow?

Apply first LalVigne™ AROMA and/or LalVigne™ MATURE.

Wait 48 H.
Apply the other product.
Frequently asked questions (II)

Should I take into account possible rainfall before applying the LalVigne™ products?
Yes, the effectiveness of the product is higher if after each application there is at least a 48h free period of rain.

What if it rains before 48 hours have passed since the application?

<table>
<thead>
<tr>
<th>SITUATION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain before 48 hours</td>
<td>Rain before 48 hours</td>
</tr>
<tr>
<td>after the 1st application</td>
<td>after the 2nd application</td>
</tr>
<tr>
<td>LalVigne™</td>
<td>LalVigne™</td>
</tr>
<tr>
<td>Make the 2nd application</td>
<td>Repeat the 2nd application</td>
</tr>
<tr>
<td>7 days after the 1st</td>
<td></td>
</tr>
</tbody>
</table>

Do the LalVigne™ products have Maximum Residual Limits? (MRL).
LalVigne™ products do not have MRL.
LalVigne™ products are food quality.
Although it is not usual, grapes could be harvested just after the application.
Attention: If it is mixed with another product, the MRL will be marked by this specific product.

How many days can I advance harvest if I apply LalVigne™ MATURE or LalVigne™ AROMA?
There is no exact value. Multiple factors should be taken into account: grape variety, temperature during ripening, etc.
To give some reference examples, we have clients who have advanced 5 days in warm regions and short cycle varieties and 14 days in cold regions and long cycle varieties. In some cases even more.
I make UREA foliar applications in some white varieties. Can I also use LalVigne™ AROMA?

Yes, LalVigne™ AROMA has a complementary effect. Increases skin thickness and compounds present in it. It will improve wine sensory characteristics and provide greater longevity and complexity. Both products can be mixed.

Can I apply LalVigne™ AROMA on red varieties and LalVigne™ MATURE on whites?

Yes, if you wish. In these cases it is a matter of wine style. We have clients doing it. They use LalVigne™ AROMA in red varieties to increase the aroma. Some use LalVigne™ MATURE in white varieties seeking the improvement of mouthfeel.

What is usual is apply LalVigne™ AROMA on white varieties and LalVigne™ MATURE on red varieties.

What product do you recommend for grapes intended to make rosé wine?

In general, LalVigne™ AROMA if the vineyard management and wine objective is to make rosé.

If you make rosé to concentrate the red wines, LalVigne™ MATURE will give you better results.

In any case you will get good results.
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.

LalVigne™ MATURE and LalVigne™ AROMA have been tested through scientific, monitored and observational studies, which have shown the effect of their application in the vineyard, in the grape and in the wine.
Elicitors and water stress. Effect on Syrah grapes & wine quality cultivated in Gruissan, France.  
Duo et al  
2014 OIV Congress. Mendoza

Impact on agronomic parameters in Vines and wine quality of foliar treatments with specific fractions of yeast derivatives.  
J. R. Lissarrague, J. Téllez, E. García, E. Peiro  
2014 ASEV US. Texas

PhD Doctoral Thesis: Examination phenolic maturity of syrah grape variety.  
Villangó Szabolcs.  
2015 Hungary

Enhancing phenolic maturity of syrah with the application of a new foliar spray.  

Foliar application of yeast derivatives on grape quality and resulting wines  
J. Téllez, V. González, E. García, E. Peiro, J.R. Lissarrague  
2015 ASEV US

Application of wine-yeast derivatives in viticulture, new ways of creating wine styles  
H. Redl, M. Redl, C. Redl et al.  
BOKU University of Natural Resources and Life Sciences, Vienna, Austria  
2015, Der Winzer 07.08.2015

Inactive dry yeast application on grapes modify Sauvignon Blanc winearoma  
2016 Food Chemistry 197 (2016)

Influence of specific inactive dry yeast treatments during grape ripening on postharvest berry skin texture parameters and phenolic compounds extractability  
2016 Macrowine

Effect on berry skin thickness and anthocyanins of muscat bailey A grape with the foliar spray application of specific inactive dry yeast.  
Institute of enology and viticulture, Univ. of Yamanashi Masashi HISAMOTO  
2017 ASEV JAPAN

Foliar application of specific inactivated yeast with action on phenolic and aromatic metabolism of grapes.  
D. Tomasi, A. Panighel, R. Flamini, L. Lovat, F. Battista  
2017 OIV congress

Impact of a specific yeast derived foliar spray on gene expression and accumulation of anthocyanin in sangiovese.  
I. Filippetti, C. Pastore, G. Allegro, E. Colucci, G. Valentini  
2017 ASEV US

Vine performance and wine quality of muscat hamburg cultivar after a specific inactivated dry yeast application as adaptation strategy to climate change  
D. Petoumenou, E. Xyrafis, C. Vassileioy, I. Dimakis and F. Battista  