

## Did You Know? CONTROLLED “WILD” FERMENTATIONS ARE HERE Sequential Inoculation Yeasts for Aromatic Complexity

It has long been known that wild non-*Saccharomyces* yeasts (particularly *Torulaspora delbrueckii*) present at the beginning of fermentations add complexity to wine. Little was known about how to culture *Torulaspora* into a reliable and consistent tool for the winemaker. Until now it has largely been a question of luck.

In recent years the fermentation scientists at Lallemand took up the challenge. The task was to isolate wild non-*Saccharomyces* and then select a *Torulaspora* of premium quality and vitality. The next challenge was to produce the yeast in an active dry form. The dry *Torulaspora* was then paired with a compatible *Saccharomyces cerevisiae* for use in sequential fermentations.

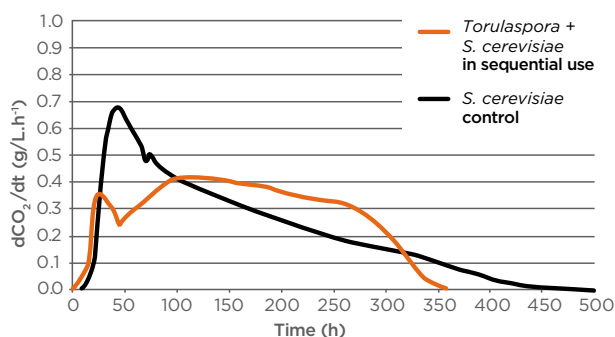
Lallemand adopted the idea of sequential fermentations to mimic what occurs in uninoculated musts. The

*Torulaspora* initiate the fermentations but as in nature the *Saccharomyces* quickly begin to dominate after a drop of only a few Brix. Lallemand has named their new two stage fermentation kit **Level<sup>2</sup>TD**.

Lallemand has been doing trials since 2004 in France, Italy, Spain, USA, Germany and Argentina to identify the most compatible yeast among the *Saccharomyces* and the *Torulaspora delbrueckii*. One such trial is indicated below (see **Figure 1**). The control wine was fermented with *Saccharomyces cerevisiae* only. The experimental wine was fermented with a blend of *Saccharomyces* and the *Torulaspora delbrueckii* in a sequential inoculation. The sequential fermentation finished about 10 hours before the control showing good compatibility of the two yeasts and thereby providing fermentation security.

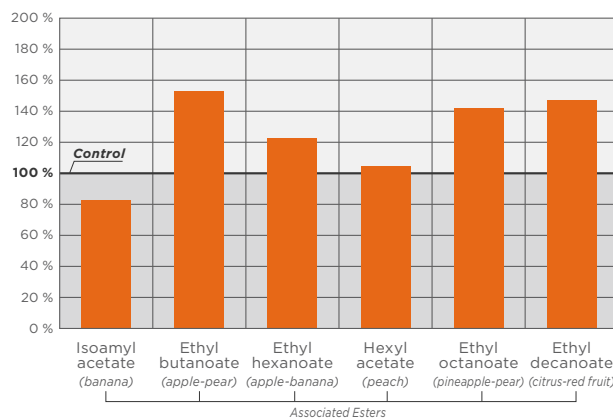
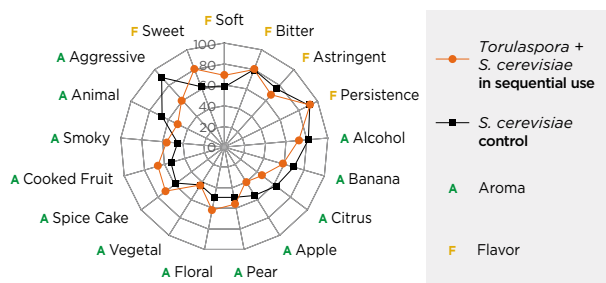
In addition, the use of **Level<sup>2</sup>TD** promotes aromatic complexity. The sequential inoculation enhances the perception of certain esters without overwhelming the wine (see **Figure 2**). Ethyl butanoate, ethyl octanoate and ethyl decanoate esters associated with apple, pear, pineapple, citrus and red fruit were enhanced compared to the control.

Results from other trials (see **Figure 3**) show that sensory attributes such as sweet, floral and spicy are increased while the aggressive attributes are reduced when compared to the control wine. Tastings showed significant preference for wines fermented in sequential inoculations with *Saccharomyces* and *Torulaspora delbrueckii* when compared to wine fermented with *Saccharomyces cerevisiae* alone.



**Figure 1:** Fermentation kinetics in sequential and conventional inoculations (synthetic must deficient in sterols; 220 g/L sugar; 13% potential alcohol (v/v); fermentation temperature 20 °C (68 °F).

**Figure 2:** Illustrates the evolution of specific esters in sequential fermentation compared to a control.



**Figure 3:** Compares the sensory profiles of **Level<sup>2</sup>TD** wines compared with wines fermented only with *Saccharomyces cerevisiae*.