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Tannin management keys
A premium Mediterranean approach

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In the past, many winemakers were only trying to achieve high tannin levels without considering the quality of these tannins when making premium red wines. This narrow view has been reconsidered due to premium red wine consumer demands and a better understanding of tannin management.

Premium red consumers prefer round mouthfeel wines.
Preference tests by consumer panels and scientific sensory analysis support the idea that the preferred profile of a premium red has a high volume (body) in the fore mouth, fine grain (smooth) tannins and an enrobed and creamy finish. This corresponds to the positive (+) profile shown in figure 1 using ICV sensory analysis descriptors. The negative (-) profile, also represented in figure 1, is the "past" wine described in the introduction.

The positive profile is reached with a global tannin management strategy.

Global tannin management is a diffusion and rearrangement (stabilization) approach.
A stabilized system between pigments, tannins and certain polysaccharides (from grapes, yeast, and lactic bacteria) is the basis of an enrobed mouthfeel premium red wine. This stabilization is obtained by an early, gentle and complete diffusion of polysaccharides, pigments and tannin complexes and then rearrangement.
Rearrangement is a direct result of yeast strain, oxygen and maceration length.
Examples of a stabilized wine (polyphenol profile +) and less stabilized wine (polyphenol profile -) is given in figure 2.
These profiles are based on practical polyphenol indices.

Maceration management keys.
Complete grape maturity concept. The berry is where the action is. Pulp, skin and seeds have different maturation rhythms depending on varietal, vintage etc. They are important to fine-tune the optimum harvest maturity including the cellular maturity and not just the traditional sugar/acid balance. Different indicators such as the berry taste and laboratory indices[i] are used to determine the optimum harvest date. For example, a premium Syrah will be picked when the color index starts its decline.
Desteming, crushing and SO_2 addition (~30ppm) are the first winery steps involved in maceration management. A good crusher will open the berry without breaking the seeds.

Certain enzyme complexes, selected for their balance of pectinases, hemicellulases and cellulases, have indirect and direct actions on diffusion of anthocyanins, tannins and polysaccharides. The indirect action is weakening the cell walls by hydrolyzing their different polysaccharides, which gives an easier diffusion of intra-cellular components. The direct action is the release of polymerized tannins located outside the cells, and linked to them with hemicellulose chains.

The yeast strain has not just a fermentation role in premium red wine making. There are five important criteria a winemaker should take into account for choosing the appropriate yeast strain:

1. Low color absorption by the yeast cell wall. There are significant yeast strain differences.
2. High production of stable polysaccharides during growth and fermentation (mostly manno-proteins). Certain selected strains can produce as much as 4X higher than others.
3. High production of stable polysaccharides during early autolysis stages, i.e. during extended maceration, and early aging stages.
4. Low production of sulfur volatile compounds responsible for sulfur-off-flavors. These compounds are always associated with harsher tannin perception in mid-palate and after-taste.
5. Low production of fusel oils and certain acetate esters. These volatile compounds are also linked with harsh dry tannin mouth-feel.

Certain strains, like ICV-D254®, combine all these 5 attributes. They can participate greatly to the tannin and mouthfeel management. For example, figure 3 shows the differences between ICV-D254® and a more common strain on Syrah mouthfeel profiles. Higher volume, lower astringency, lower bitterness and lower dryness are what premium red consumers expect. Another example illustrates the strain effect on the polyphenol profile for a Grenache after 3 years aging (figure 4).

Cap management. A specific “rack and return” method called “ICV delestage”, is another important key for good tannin management. The primary stages of the “delestage” are illustrated in figures 5,6,7 & 8. In step n°1, the juice is drained from the fermenter into another vessel and pumped into another tank while encouraging aeration during each movement. During step n°2, a **complete** draining of the cap is critical for gentle tannin diffusion during maceration. The drained cap should rest on the bottom of the tank for about one to two hours before returning the juice by quickly and gently flooding the cap without breaking it up during step n°3. Step n° 4 allows the cap to percolate up through the returned juice which again encourages diffusion of anthocyanins and tannins without harsh extraction.

Delestage in practice. As an example for a premium Syrah (figure 9), the most important delestage is carried out as soon as the initial cap is formed at the beginning of fermentation. Early delestage helps in the removal of seeds minimizing extraction of harsh and reactive seed tannins. During active fermentation usually one delestage every other day is needed to manage specific

needs for oxygen. The second most important delestage is the one at the end of primary fermentation to avoid R.S. in the cap to minimize the risk of lactic acid bacteria spoilage. How many and how often to delestage depends on the varietal and style of wine desired as well as the post fermentation maceration length.

To summarize.

The keys to good maceration management of tannins are firstly, define what style you're after. Secondly, diffuse early, gently and completely the anthocyanin and tannin complexes, and then rearrange and stabilize the polyphenol system. To accomplish this, consider a complete grape maturity concept and take advantage of new biotechnology's and oxygen management. This global maceration management approach has been put into practice for many years to produce premium reds. The results are not only popular with premium red wine drinkers, but also with the winemakers using it.

Figure 1

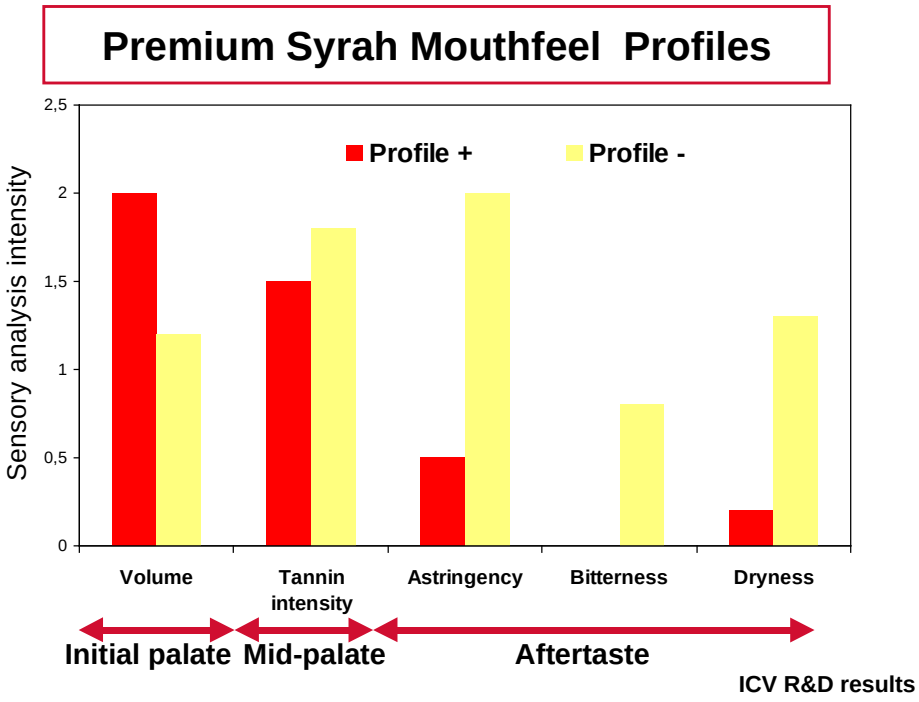


Figure 2

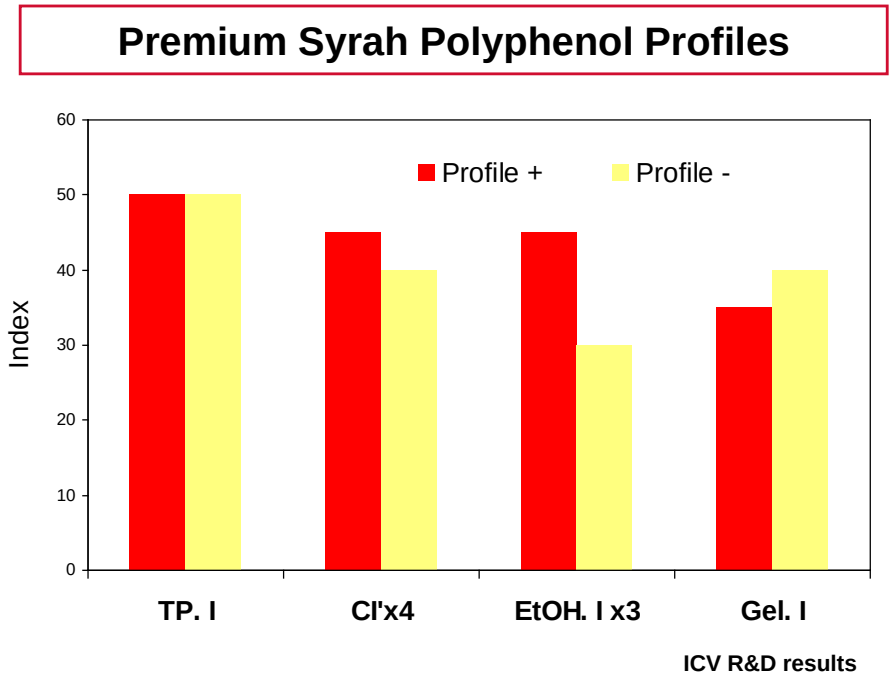


Figure 3

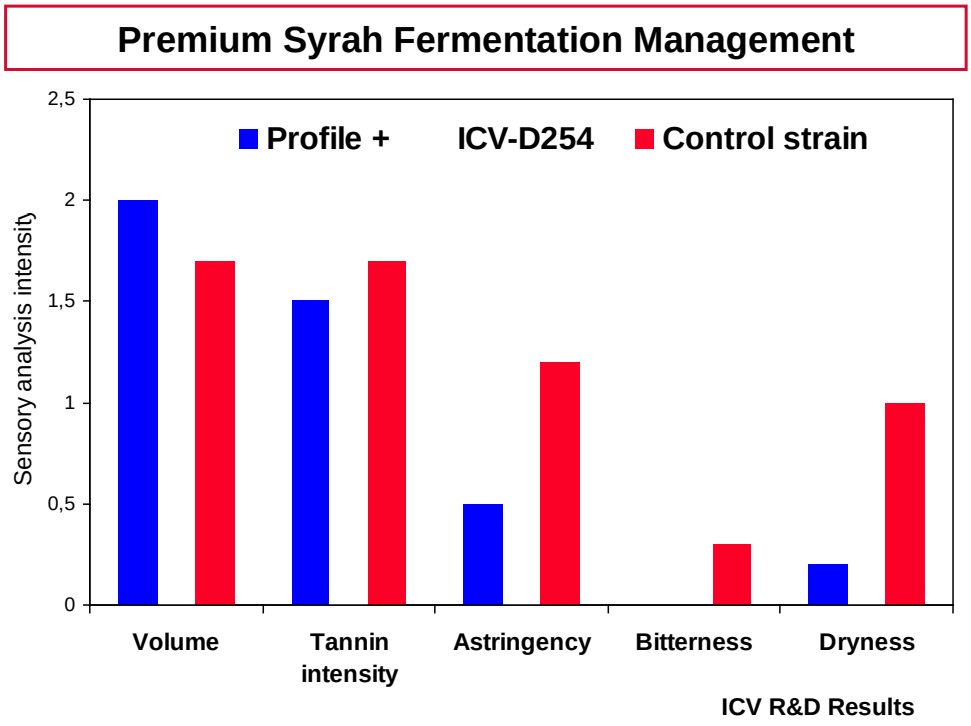


Figure 4

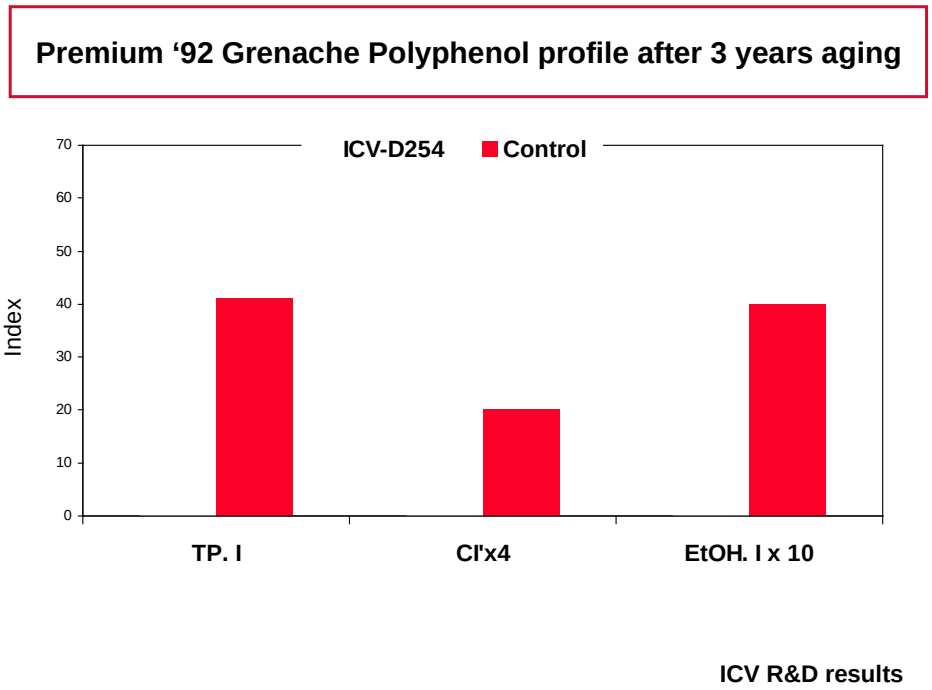


Figure 5

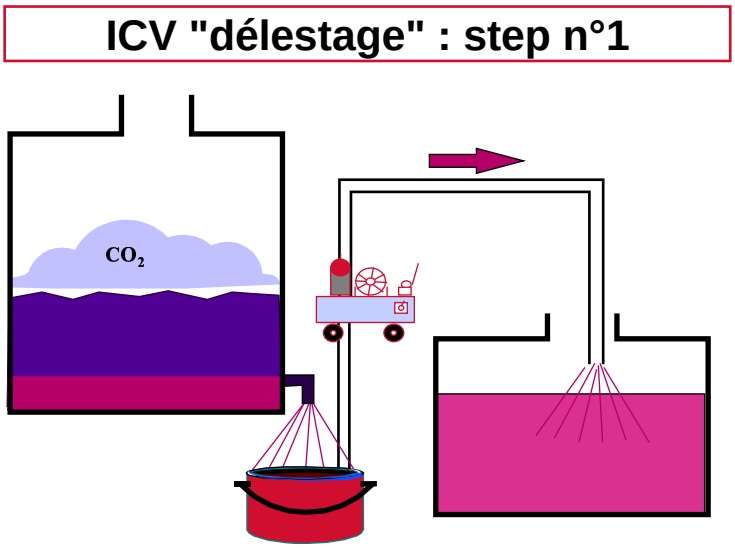


Figure 6

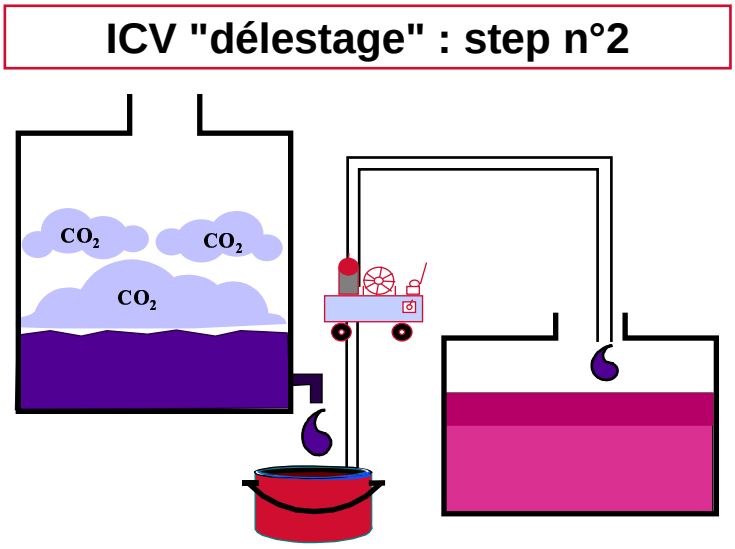


Figure 7

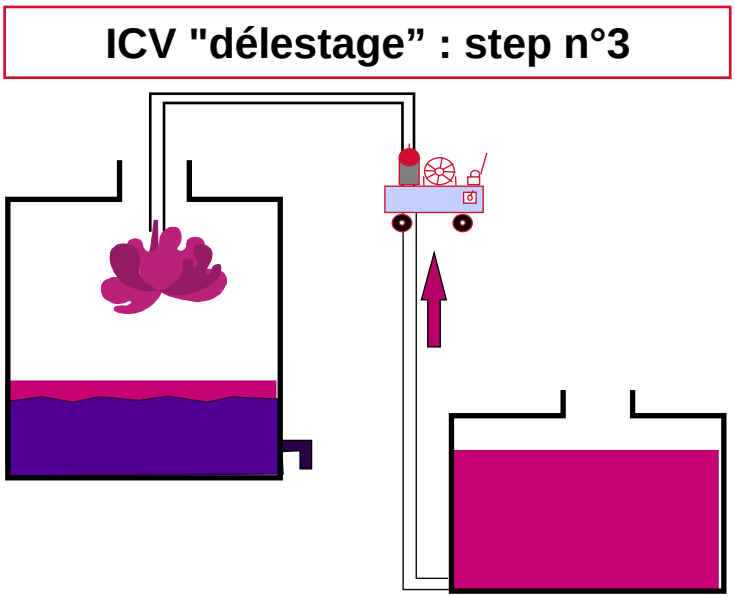


Figure 8

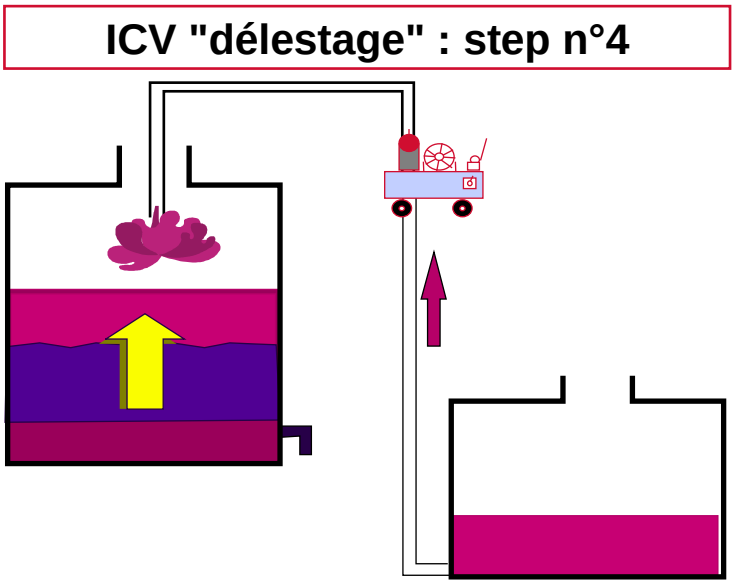
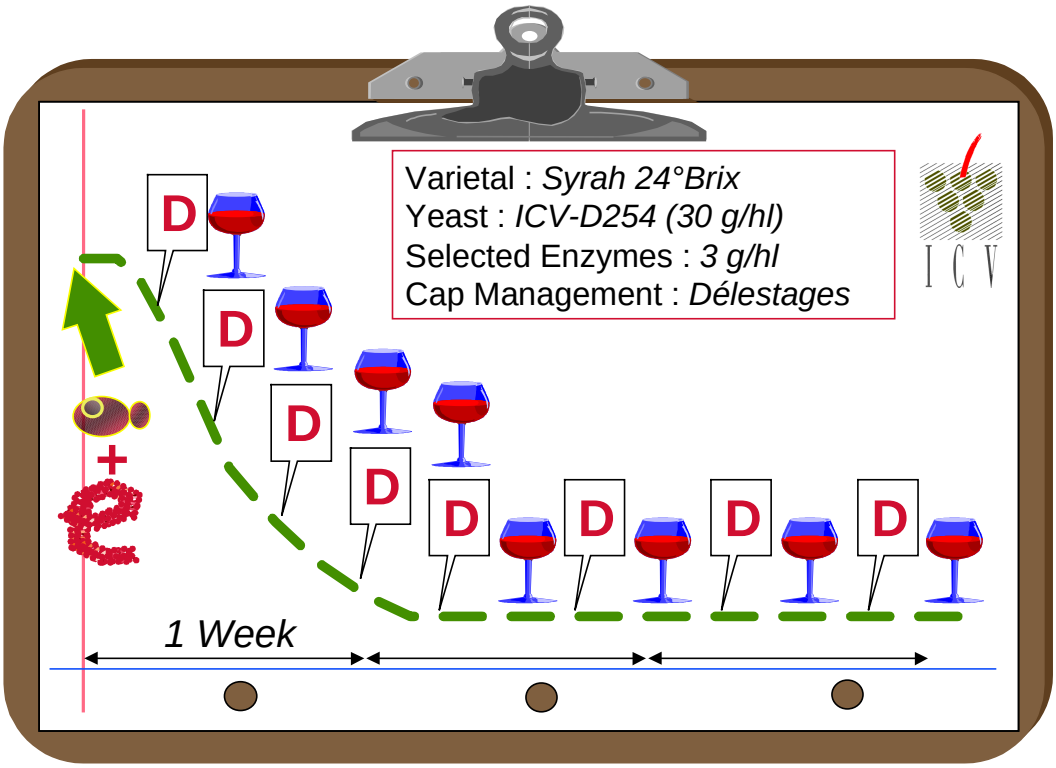


Figure 9


Varietal : *Syrah 24°Brix*
Yeast : *ICV-D254 (30 g/hl)*
Selected Enzymes : *3 g/hl*
Cap Management : *Délestages*
I C V
D
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1 Week