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WINE

FOR EVERYONE

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No Wine Without Water



Photography : Valle de Guadalupe, Mexico by Fabian Jauregui

Water is a crucial natural resource in the wine industry that we need to preserve and monitor carefully so as to keep on making great wines.

Last month, I had the extraordinary opportunity to speak at the [43rd World Congress of Vine and Wine](#) in Baja California, Mexico, thanks to [Vinitácora](#). The company is behind the first personal logbook for Mexican wines and wineries, which allows you to discover the country's wine regions and assemble your very own travel journal to note and remember your favourite wines and wineries.

As in previous editions, the congress once again inspired lively discussions on several winemaking and viticultural topics. Among the most notable was a masterful lecture by Dr Peter Hayes and Dr Hernán Ojeda on the subject of water and its sustainable use in the vineyard.

Seeing how water is an integral part of wine and grapes, we take its presence as a natural given and tend to forget the decisive impact that water has on the chemical properties of wine.

For example, only water-soluble compounds play a pivotal role in the final characteristics of wine. Even the legs or tears that appear in the glass largely depend on the properties of the water. Furthermore, water is an essential component in many of the chemical reactions related to fruit development, must fermentation, and the ageing process of the wine—in other words, the particular chemistry that makes wine, wine (Jackson, R.S., 2014).

As for water's role in the vineyard, grapevines are plants with relatively low water needs in terms of their cultivation, requiring an estimated 280 to 300 litres to produce one kilo of dry matter. Grapevines dig deep into the ground, and the suction power of their root system is impressive.

All of these factors contribute to the fact that grapevines can be grown in dry areas and make them resilient enough to withstand long periods of drought. An abundant supply of water, however, can have a positive impact on production levels, albeit with a certain effect on the quality of the resulting wine (Hernández-Cano, L.H & Hidalgo, J.T., 2011).

Water affects the grapevine in rather complex ways. Research has shown how an increase in potential vegetative growth through irrigation translates into increased plant vigour, which in turn can delay the start of fruit maturation. Likewise, excessive water use in the vineyard can shorten the lifespan of the vines and, in some cases, reduce the quality of the grapes.

That being said, a lack of water can also have negative consequences. Drought can lead to a decrease in quality, because the plant's stomata close under these conditions, thereby interrupting the flow of water from the roots. As a result, the uptake of compounds essential for plant growth and their transport through the vine's system come to a halt.

If we turn our attention to the winemaking process, water also plays a key role in several ways. It is used to clean and disinfect, and as an additive or processing aid to prepare additives.

In other words, water is involved at every stage of the winemaking process, making it an essential element that is also becoming increasingly scarce in certain parts of the world like Baja California in Mexico, the US, and many countries in Europe.

Each country is seeking and working on solutions to the problem of water scarcity in their wine regions, and circular initiatives are offering practical and effective results in this regard.

In California, wineries like [Alpha Omega](#) are actively working on the treatment and reclamation of their wastewater. All of the wastewater is processed through their Lyve system, a biodigester that adjusts the chemical composition of the water while digesting and separating suspended solids from the solution. After passing through the Lyve system, Alpha Omega decants the water into a wastewater reservoir where additional microbial activity and the settling of solids produce water that is clean enough for the winery to subsequently reuse it in their vineyards and landscaping tasks.

In Spain, the winery [Ponte da Boga](#) in Ribeira Sacra treats its wastewater with green filters. Before undergoing the filtration process, the water passes through two aerating decanters.

The use of green filters offers a natural solution for treating wastewater, but it requires a prior evaluation of the terrain and a system to monitor the results and verify their effectiveness.

The filtration system involves a piece of land planted with crops or trees where the wastewater is distributed and treated through the combined activity of the soil, microorganisms, and plants, resulting in a triple physical, chemical, and biological action.

The soil not only acts as a physical filter but also works on a biological level, causing the biochemical oxidation of the vast majority of suspended substances in the wastewater. At this point, they are assimilated by the vegetation, and those that are not will enter the aquifer in a way and at levels that do not cause its deterioration.

Other wineries, like [Jackson Family](#) in California, have harnessed the rain as a natural water supply to carry out certain internal operations at the winery. After the harvest months, the winery uses its exterior fermentation tanks to collect and store rainwater. Soft by nature, this type of water offers a desirable alternative to the municipal water supply when it comes to the water needs, for example, of the winery's cooling towers in areas like the barrel room.

In terms of winery operations, initiatives are increasingly focused on reducing the amount of water needed for cleaning, and minimizing water consumption and the generation of wastewater (fewer substances going into the wastewater). Dry cleaning processes, for instance, reduce water consumption and detergent-related waste generation in the winery.

Using ozonated water to disinfect barrels is an emergent technique that effectively controls the microbial contamination of wood and prevents the presence of substances like trichloroanisole, although this method does call for the implementation of a strict safety protocol if used in the winery.

Given that drought conditions are becoming increasingly common in wine regions previously unaffected by such climatic events, it is all the more pressing to find solutions that make it possible to use our water resources more efficiently.

This means we have to start thinking of water as a renewable but limited resource that requires the appropriate measurement and monitoring strategies to establish effective reduction and reclamation measures. This will allow us to keep doing what we love most: making high-quality wines.

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Works Cited

- Ronald S. Jackson, "Wine Science, Principles and Applications" (USA: Elsevier Inc., 2014).
- Luis Hidalgo Fernandez-Cano & Jose Hidalgo Togores, "Tratado de Viticultura, Tomo II" (Madrid: Ediciones Mundi-Prensa, 2011).

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