Summary 8

VITICULTURE & ENOLOGY
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Title: **"Sensory attributes of Cabernet Sauvignon wines made from vines with different water status"**

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In a previous article, some of the authors studied the effects of different crop yields on the sensory characteristics of Cabernet Sauvignon. In the present study, they turn their attention to another important viticultural parameter: irrigation. Even though there is a lot of research on the topic of irrigation, the studies often stop at the vineyard or the juice chemistry level. Because, to this date, the most sophisticated juice and wine chemical analysis are still unable to accurately predict a wine's sensory characteristics, the authors believe that it is important that research is carried all the way to include sensoty evaluation..

- The authors studied the effects of three irrigation levels on wine sensory characteristics: **standard irrigation** (32 liters/vine/week), **double irrigation** (64 liters/vine/week), and **minimal irrigation** (32liters/vine applied only once, when leaf water potential reached –16 bars). The standard irrigation followed the commercial vineyard regime. Irrigation started at the end of June and was applied once a week until harvest. Additionally, the authors studied the effects of these three irrigation regimes on the levels of tannins, as well as on the levels of methoxypyrazines (MIBPs), known to be responsible for bell pepper aromas.

- The authors were able to confirm that these water regimes resulted, as expected, in increasing levels of leaf water potential: minimal irrigation had the most negative values, followed by the standard irrigation, whereas double irrigation had the highest water potentials for most of the season. The different water treatments also translated into increasing yields in that same order (6 tons/acre for minimal irrigation, 7 tons/acre, for standard, and 8.8 tons/acre for double irrigation).

- The authors used the same technique of descriptive analysis used in the previous study for the wine sensory characteristics. This technique combines two well-defined, trademarked methodologies, for which the most challenging part is the training of the tasting panel. During this process, which lasted for one month, the authors closely monitored the ability of the judges to 1) discriminate among wines, 2) have reproducible results, and 3) score consistently with other members of the panel.

- **Sensory**:The authors found that the wines from minimally-irrigated vines had the most fruity and the least vegetal attributes, whereas the wines from standard irrigation vines were the most vegetal and the least fruity. More specifically, the wines made from minimally irrigated vines were significantly higher in red/blackberry aroma, jam/cooked berry aroma, dried fruit/raisin aroma, and fruit by mouth than the wines from the treatments receiving either standard or double irrigation. The double-irrigated wines were perceived to be, by comparison, very low in both vegetal and fruity aromas, low in bitterness, and low in astringency. In other words, these wines behaved for most attributes as if they had

been diluted. The authors mention in the discussion that this agrees with a previous study that found that fruity wines were most often associated with vines grown on low water-holding-capacity soils, whereas vegetal wines were usually associated with high water-holding-capacity soils.

- **Tannins:** The standard irrigation wines were the highest in tannin concentration, measured using the Davis protein precipitation assay. This result matched the sensory panel's higher astringency ratings of this wine.

- **Pyrazines:** In contrast to tannin levels, the pyrazine concentrations did not follow the perceived vegetal aroma intensities. The authors suggest that, even if a high level of pyrazinee were present, some other compounds produced by the minimally-irrigated vines (such as esters, acetate esters, fatty acids, or norisoprenoids) might have enhanced fruity aromas that would have masked the vegetal ones.

- The authors discussed the possibility of whether treatment differences in grape maturity at harvest might have influenced the results. In their opinion, the sensory differences observed were likely not due to differences in sugar accumulation alone, given that an effort was made to harvest all treatments at a similar Brix. It is common in many viticultural trials to have to face the difficult choice of 1) trying to match Brix, or 2) trying to match picking date. The authors believe both approaches are valid, and mention the pros and cons of each.

The research presented confirms some things that winegrowers and winemakers have assumed for several years now. Difficult as the task seemed, the authors were able to address the sensory portion of the research in a rigorous and methodical fashion . This was critical to the validity of their findings. Their results is the scientific proof that our beliefs were correct: if we want to emphasize fruity aromas and reduce the vegetal character of a wine, we need to start by practicing some level of deficit irrigation in the vineyard.

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