

## **Climate Influences on Yield, Berry and Wine Quality in Monastrell Wine Grapes in a Warm Winegrowing Region (Jumilla Area, SE Spain)**

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### **Abstract:**

The effects of climatic factors on yield, berry, and wine quality for long-term (7 years) deficit irrigated (DI) Monastrell wine grapes under the semiarid conditions of SE Spain were analyzed. The relationships between climatic variables and the yield, berry (QI<sub>overallberry</sub>), and wine quality (QI<sub>wine</sub>) novel indices confirmed that the most important climatic factors were rainfall, temperature, and radiation. Climate was more influential in determining yield, berry, and wine composition in some important physiological periods, such as early season (budburst-fruit set) and ripening (veraison-harvest). Greater rainfall during dormancy and early season was related with greater yield, QI<sub>overallberry</sub>, and QI<sub>wine</sub>; in contrast, rainfall late in the season, during the veraison-harvest period, was related negatively with berry and wine quality. Similarly, solar radiation impacted positively during dormancy and early season and negatively during late season. In addition, greater T<sup>a</sup><sub>max</sub> during the dormancy, early season (budburst-fruit set) and veraison-harvest periods influenced negatively the QI<sub>overallberry</sub> and QI<sub>wine</sub>, while greater T<sup>a</sup><sub>max</sub> during other periods, such as fruit set-veraison were - in general - positive for berry and wine quality. Besides greater T<sup>a</sup><sub>min</sub> (high nighttime temperatures) also exerted a negative influence, reducing QI<sub>phenolicberry</sub>, although had positive effects in yield, QI<sub>technologicalberry</sub> and QI<sub>wine</sub>. In general, climate had more influence on berry quality than on wine quality. **Keywords** Berry quality index; Climatic Factors; Phenological Periods; Regression models; Wine quality index; Yield