Research Article

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

Romero P[1 *], Fernández-Fernández JI[2] , Bravo-Cantero AF[3] , Ayala MC[4] and Botía P[1]

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 (QIoverallberry), and wine quality (QIwine) 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, QIoverallberry, and QIwine; 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 Tªmax during the dormancy, early season (budburst-fruit set) and veraison-harvest periods influenced negatively the QIoverallberry and QIwine, while greater Tªmax during other periods, such as fruit set-veraison were - in general - positive for berry and wine quality. Besides greater Tªmin (high nighttime temperatures) also exerted a negative influence, reducing QIphenolicberry, although had positive effects in yield, QItechnologicalberry and QIwine. 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