Geophysical Research Abstracts
Vol. 16, EGU2014-8642, 2014
EGU General Assembly 2014

Effects of climate variability on irrigation scheduling in white varieties of Vitis vinifera of NW Spain

Emma M Martínez (1), Emiliano Trigo-Córdoba (1,2), Yolanda Bouzas-Cid (2), María Fandiño (1), Benjamín J Rey (1), Jose M Mirás-Avalos (2), and Javier J Cancela (1)

(1) GI-1716. Agroforestry Engineering Department. Univ. Santiago de Compostela, Lugo, Spain (javierjose.cancela@usc.es), (2) Estación de Viticultura e Enoloxía de Galicia, Leiro (Ourense), Spain

Inter-annual climate variability, in particular the temporal distribution of rainfall is regarded as a critical factor to obtain an optimal irrigation management on crops, being more marked their relevance in Atlantic climates. The presence of precision irrigation systems in Vitis vinifera (L.) has created the need to understand the physiological effects on plant, and vineyard soils, together with production and quality parameters, to achieve and adequate irrigation management. This trial was performed on two relevant white grapevine varieties from Galicia (NW-Spain), cv. 'Albariño' (D.O. Rías Baixas and Ribeiro) and cv. 'Godello' (D.O. Valdeorras and D.O. Monterrei) during the 2012 and 2013 seasons. Two treatments were established following a completely randomized block design with four replications (7 plants each). The treatments were rainfed (R) and surface drip irrigation (DI), these last one was not applied in DO Monterrei during 2012. Irrigation was initiated when an average value of 400 cumulative degree days was reached, ending 15 days before the harvest. Different bioclimatic indices were calculated to characterize each season and location: Cool night index (CI); Heliothermal index (HI), which corresponds to Huglin's heliothermal index; and Winkler index. To assess the water status of the vines leaf (Ψmid) and stem (Ψstem) water potentials were measured at noon. Finally, production and qualitative data were collected for each treatment. No differences between DOs were observed for 'Godello' cultivar in bioclimatic indices within the Geoviticulture MCC system (Tonietto and Carboneau, 2004), indicating temperate warm-temperate (HI) and very cool nights (CI). For the Winkler index, cv. Godello is within the region I, near the region II in the case of D.O. Valdeorras in both years. In the case of 'Albariño', warmer nights were observed in DO Rías Baixas compared with DO Ribeiro, whereas the opposite was found for the thermal index. Leaf water potential showed that the maximum differences between treatments in D.O. Monterrei, were of 0.26 and 0.36 MPa, for Ψmid and Ψstem, respectively, with maximum values by Ψmid about -1.5 MPa in R vines, during 2013. In D.O. Valdeorras, these differences were similar in the case of Ψmid in both seasons, but the differences between treatments in Ψstem were never higher than 0.19. Production parameters showed a worse overall productive performance in DO Monterrei, with lower yields for both years. Qualitative parameters were stable over the two growing seasons studied, since an adjustment of harvest date was made in 2013. In the case of 'Albariño', in both DO Rías Baixas and DO Ribeiro, a slight improvement in yield was obtained under irrigation conditions. However, quality attributes were similar for both treatments. The irregularity in temperature and precipitation in NW Spain makes to adjust irrigation schedules necessary to obtain a homogeneous harvest, in quantity and quality.