EMS Annual Meeting Abstracts
Vol. 15, EMS2018-177, 2018
© Author(s) 2018. CC Attribution 4.0 License.

Climate change threats and adaptation in Portuguese viticulture

João Andrade Santos, Ricardo Costa, and Helder Fraga
UTAD, CITAB, School of Sciences and Technology, Physics Dep., Vila Real, Portugal (jsantos@utad.pt)

Vitiviniculture in Portugal is deeply rooted in traditions and culture. Despite being a relatively small country, with prevailing Mediterranean environments, Portugal comprises an outstandingly large diversity of terroirs. The vineyard area in Portugal is roughly 190 000 ha, being the 11th wine producer and 9th wine exporter worldwide. Owing to the strong sensitivity of the grapevine physiological development to weather and climate conditions, grape berry quantity and quality reveal important inter-annual variability. Grapevines are also vulnerable to climate change, as their responses will be different under future climates, which may threaten wine typicity of a given region, or even its viticultural suitability. In the present study, climate change impact assessments are carried out for RCP4.5 and RCP8.5 and using a multi-model ensemble from the EURO-CORDEX project. Datasets were subsequently statistically downscaled to 1 km grid resolution over Portugal. We show that the projected future warming and drying trends for Portugal are expected: 1) to significantly shift current grapevine growing thermal conditions (e.g. heat and chill accumulation), 2) to enhance water stress, 3) to anticipate phenological timings and 4) to modify yields. Furthermore, we also provide some results regarding the effectiveness of irrigation and mulching in vineyards as potential adaptation measures, using the STICS crop model. Our findings reveal that their efficiency will strongly depend on the strength of the local climate change signal and on the current local conditions, thus highlighting the need for local-to-regional climate change assessments. Acknowledgements: This study was funded by the R&D project INNOVINE&WINE – Vineyard and Wine Innovation Platform, NORTE-01-0145-FEDER-000038, co-funded by FEDER (Fundo Europeu de Desenvolvimento Regional) through the programme NORTE 2020 (Programa Operacional Regional do Norte 2014/2020).