

## Climate Change Adaptation of the Portuguese Viticultural Sector

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**Abstract :** Vitiviniculture in Portugal is a key socio-economic sector, with a strong connection to local traditions and culture. Despite being a relatively small country, with prevailing Mediterranean environments, Portugal comprises an exceptionally large diversity of growth conditions (Terroirs). The vineyard area in Portugal is over 190 thousand hectares, being the eleventh wine producer and ninth wine exporter worldwide. Owing to the strong impact of weather and climate conditions on grapevine physiological development, grape berry quantity and quality show important inter-annual variability. Grapevines are also susceptible to climate change, as their responses will be unavoidably different under future climates. These impacts may change wine typicity of a given region or even its viticultural suitability. The current study reveals that the projected warming and drying trends for Portugal under the Representative Concentration Pathway (RCP) 4.5 and 8.5, are projected to 1) significantly shift current grapevine growing thermal conditions (e.g., heat and chill accumulation), 2) enhance water stress, 3) anticipate phenological timings and 4) modify yields. Moreover, the present study provides some hints regarding the effectiveness of mulching and irrigation as climate change adaptation measures. Our results show that the effectiveness of these adaptation measures will strongly rest on the strength of the climate change signal at a local scale, thus emphasizing the need for local-to-regional climate change assessments.

**Keywords :** viticulture, climate change, adaptation measures, Portugal

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