

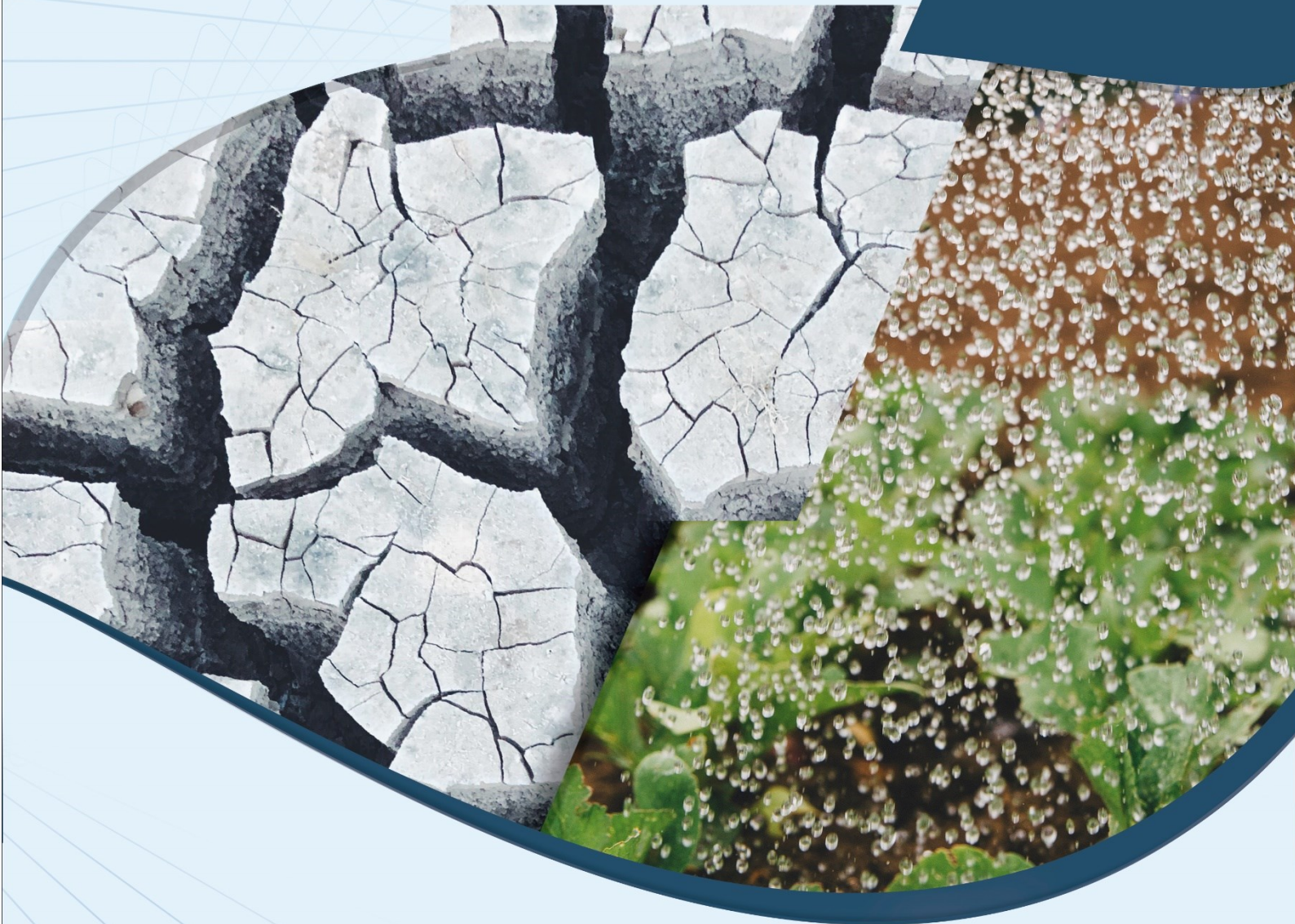


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Kaolin effects on berry quality of Touriga-Franca grapevines in distinct Mediterranean wine-growing regions

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Grapevine ripening is modulated by temperature and precipitation levels, affecting the yield and berry quality potential, particularly in Mediterranean-type climate regions that were recently described as climate change hotspots. In those regions, the foliar application of protectants is considered a short-term strategy to avoid leaf and cluster damage and improve the physiological performance of vines. However, in vineyards with distinct mesoclimates, kaolin effectiveness within a given variety remains less explored, as well as its putative role in improving berry ripening under a changing climate. Thus, this study was performed in two Portuguese wine-growing regions (Alentejo and Douro) and aimed to monitor the effects of a foliar pre-veraison kaolin (5%) treatment on several berry quality traits and phenolics accumulation in Touriga-Franca berries during the 2017 growing season. Based on three bioclimatic indices, the Alentejo vineyard showed a lower night temperature index (CI class: cool nights) than the Douro vineyard (CI class: temperate nights). However, both sites presented a very warm and dry climate classification. At veraison, berry soluble sugars decreased in treated grapevines from both vineyards, while total acidity and tartaric acid increased 30.6% and 17.2%, respectively, in the treated berries from Alentejo. Though kaolin treatment had no consistent effect on the berry acidity parameters in the Douro vineyard at this stage, berry total phenols, ortho-diphenols, and anthocyanins increased at harvest in treated vines. On the other hand, no significant effects were observed regarding these parameters in the Alentejo vineyard, while tannins increased 60.2% in treated berries, and soluble sugars decreased (-30.2%). From a climate change perspective, the application of protectant compounds should be further explored in the wine industry to elucidate the advantages of particle-film application on improving wine quality and winemaking performance.