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DROUGHT TOLERANCE OF VARIETIES IN SEMI-ARID AREAS: CAN THE BEHAVIOR OF TEMPRANILLO BE IMPROVED BY VARIETIES OF ITS OWN LINEAGE?

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Abstract:

Context and purpose of the study – Tempranillo is the most widely grown red grapevine variety in Spain, currently representing 42% of the total number of red varieties and 21% of the total vineyard area. Due to the economic importance that this variety represents in Spanish viticulture, in some areas where it is traditionally grown, there is a special concern about the viability of the future growing of this variety is being compromised by the climate change effects. On the other hand, two previously unknown varieties have recently been recovered in Castilla-La Mancha region, Benedicto and Moribel, which proved to be parental and descendant, respectively, of the Tempranillo variety. The present work compared the behavior to drought of this varieties family to evaluate whether the behavior of the Tempranillo variety can be improved by that of its two relatives in this scenario.

Material and methods – Vines of Tempranillo, Benedicto and Moribel varieties grown in an experimental vineyard located in Tomelloso (Castilla-La Mancha, Spain) was monitored during two consecutive seasons. The vines were grown under two different water deficit regimes (dry and wet, respectively). The phenology of the varieties was noted, and at the time the grapes reached maturity, the yield per vine and berry weight were determined. In the must obtained by squeezed, total soluble solids, total acidity, pH and $\delta^{13}\text{C}$, and in grape extracts total polyphenol index and anthocyanins were analyzed. Varietal aroma potential index was also determined in grapes.

Results – Benedicto and Moribel had higher yields and smaller berry size than Tempranillo, favoring quality. As for the physicochemical parameters of the musts, both total acidity and pH showed statistically higher and lower values, respectively, than those obtained in Tempranillo. Regarding $\delta^{13}\text{C}$, in both water treatments Tempranillo manifested higher stress levels than Benedicto and Moribel. The grape quality parameters were comparable in Moribel and Tempranillo, but lower than those of Benedicto. The results obtained suggest that when grown under restrictive water conditions, both Benedicto and Moribel behave better than Tempranillo. Therefore, in the near future, it is likely that the cultivation of these hitherto unknown varieties will increase in semi-arid areas, to the detriment of Tempranillo.

Keywords: grapevine, water stress, yield, grape quality.