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Título artículo: Quantifying the Effects of Water Status on Grapevine Vegetative Growth, Yield, and Grape Composition Through a Collaborative Analysis.

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RESUMEN: The consolidation of scientific knowledge is based on the accumulation and understanding of previous findings. Nowadays, reviews of scientific literature have become more effective through the use of meta-analyses, which are systematic evaluations of the results from multiple studies. Similarly, mega-analyses, which combine raw data from many studies into a single sample for processing and statistical analysis, are a very powerful tool for analyzing results of heterogeneous origin but require a high level of collaboration between the researchers contributing data. In the framework of a collaborative methodology between different Spanish viticultural research groups, this work uses a mega-analytical approach to quantify the effects of changes in vine water status on vine vegetative growth, yield, and grape composition, integrating a wide range of growing conditions to obtain robust general trends of vine performance under water stress. The mean seasonal stem water potential data from the different studies allowed a classification into five levels of water status (no stress -> mild -> moderate -> high -> severe). A progressive decrease in vegetative growth with increasing stress level was observed, while yield decreased more markedly as vine stress progressed from moderate to high. On the other hand, titratable acidity was more sensitive to variation in water status than sugar concentration, with a greater decrease in titratable acidity when changing from no stress to moderate stress. Conversely, increasing water stress from moderate to high resulted in the greatest increases in grape anthocyanin in the red varieties explored. The results obtained in this work, provide solid information on general trends in grapevine response to water deficit that can be used in simulation models or incorporated by grape growers in their decision-making processes in relation not only to irrigation management but also on other agronomic tools to impact grapevine water status.

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