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**Título artículo:** Effects of Water Stress on the Phenolic Compounds of 'Merlot' Grapes in a Semi-Arid Mediterranean Climate

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**RESUMEN:** Of all the abiotic stress types to which plants grown in fields are exposed, the most influential is water stress. It is well accepted that adopting controlled deficit irrigation strategies during the growing season has beneficial effects on the chemical compositions of grapes and red wines. However, there is a discrepancy in the timing, intensity and duration of deficit. This study aimed to evaluate the changes in phenolic composition of 'merlot' cultivar grapes when subjected to different levels of water stress in a semi-arid Mediterranean climate. Four treatments with different water stress levels were applied within two phenological intervals (flowering-veraison, veraison-maturity) to 128 grapevines for two consecutive years. The water stress levels for Treatments 1, 2, 3 and 4 were: no-light, light-moderate, moderate-intense and intense for the flowering-veraison and veraison-maturity intervals, respectively. Water stress distinctly affected the phenolic compounds in skin and seeds. The concentrations of flavan-3-ols and total polyphenols were much higher in seeds than in skin, and in both fractions, tannins are the major compounds.