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# BOOK OF ABSTRACTS

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## Unraveling drought tolerance mechanisms in almond: A comparative transcriptomic study of grafted and self-rooted cultivars

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Almond (*Prunus dulcis* [Mill.] D.A. Webb) represents one of the world's most valuable nut crops, yet its production is increasingly threatened by water scarcity. To maintain stability under drought stress, a deeper understanding of the molecular mechanisms behind the drought tolerance responses is essential. The transcriptomic changes in almond cultivars subjected to short-term drought stress over a 48-h period were analyzed in this research. In this study, four almond cultivars ('Lauranne', Isabelona<sup>®</sup>, Mardía<sup>®</sup> y Vialfas<sup>®</sup>) grafted onto the Garnem<sup>®</sup> rootstock, an almond × peach hybrid) were subjected to drought stress for 48 h, along with self-rooted 'Lauranne' and Vialfas<sup>®</sup> plants. The plants were arranged in a completely randomized design under two treatment conditions: control (fully irrigated) and drought (no irrigation). The main objectives of this study were to compare gene expression profiles among four cultivars to identify cultivar-specific responses related to water use efficiency (WUE), and to assess the role of the rootstock in the gene expression differences found between grafted and self-rooted cultivars. Marked contrasts were found among the cultivars in the number of differentially expressed genes (DEGs). The combination "Isabelona<sup>®</sup>/Garnem<sup>®</sup>" showed a strong response with a 15-fold increase in 1,119 DEGs compared "Mardía<sup>®</sup>/Garnem<sup>®</sup>", which showed only 73 DEGs. These contrasting results suggest that Isabelona<sup>®</sup> may mobilized a broader or more dynamic regulatory network to counteract water stress, while Mardía<sup>®</sup> appears to relay on more stable expression strategies. The genes and molecular pathways associated with these responses are further discussed, offering new perspectives for breeding drought-tolerant almond cultivars and promoting sustainable orchard management in increasing arid environments.