Chemical activation of ABA signaling in grapevine through ABA receptor agonists

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Abstract (250 words)

Grapevine (*Vitis vinifera*) and its derived products, in terms of cultivated area and economic volume, constitute the most relevant fruit crop in the world (7.5 million cultivated hectares). In the current context of climate change, the wine sector faces unprecedented challenges to satisfy a growing demand for wines of greater quality through sustainable viticulture. Global warming threatens quality wine production in Mediterranean wine regions in particular. The increase in heatwaves and drought episodes accelerate the vine phenology and alter the ripening and composition of grapes and wine. Extreme abiotic stress episodes compromise grape production and plant survival, intensifying the pressure on the use of limited resources like water. Abscisic acid (ABA) is an important hormone in the ripening of certain fruits and in plant response to abiotic stress. The application of ABA may be an appropriate strategy to facilitate the vine's adaptations to stress, modulating the production and quality of grapes. Several studies have shown that ABA initiates and regulates ripening in non-climacteric berries such as grapes. One of the ABA's roles is increasing the production of anthocyanin. There is an emerging field for the development of molecules that act as ABA receptor agonists but have a longer half-life. These agonists are small molecules that can modulate ABA signaling in a timely, dynamic, and exogenous manner. We explored the use of ABA receptor agonists (iSB09 and AMF4) in grapevine cultivars (Bobal and Tempranillo) to induce ABA-like responses that might benefit plant adaptation to drought or grape composition.

Keywords: abscisic acid, ABA receptor, agonist, abiotic stress, Bobal-Tempranillo