Vinifera master thesis abstract

Thesis title: Canopy management practices to reduce the velocity of berry maturation in order to synchronize technological and phenolic ripeness in *Vitis vinifera* L. cv. Merlot, growing in Mediterranean climate conditions

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Confidential: ☐ **Yes** ☒ **No**

Abstract

Topic position & objectives:
Considering the predicted scenarios of climate change for the near future, Mediterranean vineyards, especially in the Northern Hemisphere, may face substantial shifts in precipitation, atmospheric conditions (carbon dioxide enrichment) and temperature, resulting in higher winter rainfall, together with drier and hotter summers. All potentially contributing to an uncoupling of technological and phenolic ripeness in Vitis vinifera grapevines, due to berry ripening taking place in the hottest month of the year, resulting in wines with high alcohol content and low titratable acidity. A reduced sugar accumulation rate in the berry may delay berry maturation and subsequently counteract these effects.
The aim of this study was to delay berry maturation in Vitis vinifera L. cv. Merlot grapevines, by altering the source: sink relationship of the vine through two contrasting post-versaison source limiting canopy management practices.

Methods:
The selected treatments applied included: 1) Severe topping of all shoots in the canopy to an average length of 40cm (TOP), consequently reducing the amount of source; and 2) Anti-transpirant Vapor Gard ® spray (VAP) applied to the complete canopy surface, consequently reducing the photosynthetic capacity of the source. A range of vine and berry parameters were recorded during a 42-day post treatment (veraison) period.

Results:
TOP and VAP as post-veraison source limitation treatment had no significant effect on total soluble solids (TSS) concentration, pH and titratable acidity (TA) in grape berries with comparison to berries of CTR vines at any of the measuring dates after treatment. Total anthocyanin and phenolic concentration in the skin of berries, expressed as mg per cm^2 skin showed no significant difference for any of the treatments at any of the measuring dates. The present study therefore, shows that a reduction in photosynthesis activity during the post-veraison period may not necessarily lower TSS, restrict TA reduction or impact phenolic content in grape berries.

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Main conclusions:
It can be concluded that although the post-verasion source limitation approach holds great promise to study environmental phenomena like climate warming and carbon dioxide enrichment, careful planning and design of experiments are necessary, especially considering the time of treatment and the time of harvest after treatment.
Keywords (5): berry ripening, source limitation, climate change