



RELATIVE IMPACT OF CROP SIZE AND LEAF REMOVAL ON AROMATIC COMPOUNDS AND PHENOLIC ACIDS OF ISTRIAN MALVASIA WINE

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Abstract:

Context and purpose of the study - Although several studies investigated the impact of crop size or fruit zone microclimate on aromatic or phenolic composition of wines, the effects of these two practices were not assessed and compared in the same study through a technological experiment within the same vineyard. Therefore, their relative effectiveness is hard to compare, which in turn is essential for providing producers with valuable information as a basis to choose adequate approach in yield and canopy management. The aim of the study was to investigate the effects of two crop sizes and two different fruit zone microclimate conditions obtained by leaf removal in a two-factorial experiment, in order to assess and compare their relative impact on Istrian Malvasia (*Vitis vinifera* L.) white wine aroma and phenolic composition.

Material and methods - Two crop sizes were combined with leaf removal or untreated control in 2x2 factorial design. For low crop size treatment (LCS), vines were trained to simple Guyot training system consisting of one spur with two buds and one cane with eight buds, while for high crop size treatment (HCS), vines were trained to double Guyot training system consisting of two spurs with two buds and two canes with eight buds each. In order to obtain two different fruit zone microclimate conditions, vines were subjected to manual leaf removal of five leaves per shoot, from the second to the sixth node (LR), or were left non-defoliated, as untreated control (UC). Leaf removal was carried out when berries reached approximately four mm in diameter (pepper-corn size). Microvinifications were conducted separately for each experimental plot in 5 L glass bottles. The research was conducted over two consecutive vine-growing seasons.

Results - Crop size showed limited impact on aroma compounds in wine and the concentration of some esters was even increased by higher crop size. In contrast, leaf removal increased the concentration of several aroma compounds and especially monoterpenes and esters. The concentration of hydroxycinnamic acids in wine was enhanced only by leaf removal, while no consistent impact of the investigated factors on hydroxybenzoic acids was observed. The obtained results suggest that in cases where environmental conditions are not limiting, increasing the crop size under adequate microclimate in fruit zone has no detrimental effects on white wine aroma and hydroxycinnamic acids composition, potentially leading to economically more sustainable grape production.

Keywords: Crop size, Leaf removal, Wine, Aroma compounds, Phenolic acids.