

Influence of partial rootzone drying on grape and wine anthocyanin composition

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The effect of Partial Rootzone Drying (PRD) on fruit and wine composition has been investigated. At harvest, total anthocyanin and phenolic concentration of Shiraz and Cabernet Sauvignon fruit was either unaltered or increased by PRD relative to control irrigation over two seasons. Where there was an increase in anthocyanin concentration with PRD, this was independent of berry size. In the 2002 season, total colour of Cabernet Sauvignon wine was enhanced by 10% in response to the PRD treatment although total anthocyanin concentration was unaltered in either fruit or wine. This colour enhancement was maintained after a year's ageing in the bottle and was due to an increase in coloured pigments in co-pigmented or polymeric form, that is, in association with other anthocyanins or phenolic compounds. In both fruit and wine samples, PRD caused a decrease in the contribution of malvidin-glucosides to total anthocyanins. Thus, levels of non-malvidin glucosides, namely delphinidin and cyanidin were increased by PRD. This effect was investigated as fruit matured post-veraison, and was evident from early in berry development. Preliminary results indicate that this response requires the presence of high incident light levels to the bunch zone during development, but it is not mediated by increased bunch exposure alone. Shading of fruit led to a significant decrease in all anthocyanin types, and caused a shift in the ratio of acetyl- and 3p-coumaryl-glucosides to mono-glucosides. The PRD treatment, however, did not lead to changes in the proportions of acetyl-, 3p-coumaryl- and mono-glucoside anthocyanins. These results show that the response of the anthocyanin pathway to the PRD is most likely mediated by physiological signals within the fruit and vine, rather than due to a change in bunch microclimate.