THE RELATIONSHIP BETWEEN WIND EXPOSURE AND VITICULTURAL PERFORMANCE OF *VITIS VINIFERA* L. CV. MERLOT IN A COASTAL VINEYARD (SOUTH AFRICA)

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The South Western Cape of South Africa is exposed to strong southerly and south easterly synoptic winds during the growth period of the grapevine. The development of sea breezes in the afternoon is also a phenomenon associated with the ripening period of grapes cultivated in this coastal area. Wind is one of the environmental variables having the greatest spatial variation but the implications of regular exposure to wind for the performance of the grapevine has not yet been determined for vineyards in the South Western Cape. This study was initiated to meet this need.

The study was conducted in a hedge-trellised vineyard of *Vitis vinifera* L. cv Merlot with north east - south west row direction. Thirty experimental sites, each consisting of 14 vines, were identified as being exposed to wind or sheltered based on hand-held anemometer readings during the 2001/2002 season. Four stationary anemometers were strategically positioned between the thirty sites. Stomatal conductance and leaf temperature were measured with a PP systems porometer. Vegetative and yield measurements were performed during the 2002/2003 season. The t-test of equal variance was used to determine significant differences in measured parameters between exposed and sheltered grapevines.

Stomatal conductance and leaf area were significantly reduced by exposure to wind. This was associated with a significant reduction in the leaf area of primary shoots, related to shorter shoots, but a significant augmentation of secondary shoot leaf number and area. The number of bunches per vine and yield were also reduced for exposed vines. The berry potassium content was significantly increased for exposed grapevines.

This demonstrates that exposure to wind can result in significant within-vineyard, and potentially between-vineyard, variability in grapevine physiology, vegetative growth, yield and berry composition, with implications for wine style and quality.