

Interactive
Comment

Interactive comment on “The use of soil electrical resistivity to monitor plant and soil water relationships in vineyards” by L. Brillante et al.

Anonymous Referee #2

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General comments The manuscript (Brillante et al.) aims at reviewing both the importance of plant and soil water relations in viticulture and the opportunities offered by the use of soil electrical resistivity (ER) to monitor them. It ends with an example illustrating how ER enables to relate the distribution of water availability in the soil profile and the grapevine water status. This topic is particularly relevant as (1) for a good control of grape yield and quality, grapevine should experience a moderate water stress during the reproductive phase of its cycle, (2) in vineyards, soil profiles and root distributions are often heterogeneous. It is then quite useful to be able to monitor the distribution of water availability within soil profiles. But the determinants of ER other than water should also be clearly identified. The manuscript provides a comprehensive and up-to-date review of the soil-plant water relations in vineyards and of the assessment of

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soil water availability in 1D (TDR) and 2D (ER), with a development on the types of models relating ER to soil water content (SW). Yet the transitions between chapters could be improved. Indeed, §3 explains that SW is not fully available to plants (and that this availability should be estimated rather by the TTSW), yet §4 details models relating ER to SW, whereas §5 presents profiles of soil water actually available to plants (FTSW) calculated from ER. It should clearly be stated that both SW and FTSW can be estimated from ER; the cited reference Brillante et al (2014) deals with SW and not FTSW.

Specific comments The authors alternate “terroir expression” and “terroir effect”; I suggest they use only one formulation, “effect” being the simplest. The introduction introduces (shortly) the issue of soil–plant water relations, not the methodological issue of estimating SW (or FTSW) from ER. p 678 | 21: vegetative growth and yield formation are also affected by the environment of grapevines p 680 | 4: it could be stated here that all processes of crop physiology do not have the same sensitivity to water stress (Pellegrino et al, 2005. Towards a simple indicator of water stress in grapevine (*Vitis vinifera*L.) based on the differential sensitivities of vegetative growth components. Aust. J. Grape Wine Res. 11, 306-315) p 681 | 17: what is the meaning of “more consistent”? p 682 | 11: “soil is not a homogeneous medium”, this is what justifies the interest for mapping soil water from ER measurements; it could appear earlier, in the introduction p 687 | 24: “inverted ER” should be explained p 690: would it be too long to provide the mathematical formulation of one of the cited models? p 691 | 25: does SVW differ from SW? what is the meaning of ASW and FTSW? (FTSW is defined in the following page) figures: the title of the ordinate is missing (elevation?) Conclusion: This conclusion is very similar to an abstract. It should rather “conclude” about the relevance, the possible limitations and the perspectives opened by the use of ERT for monitoring and mapping the soil water availability.

Interactive comment on SOIL Discuss., 1, 677, 2014.