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Preliminary results of a geoelectrical survey in a vineyard in Estremoz, Portugal

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In 2014 a geophysical survey was carried out in a vineyard in Quinta do Mouro, in the wine region of Estremoz, in southern Portugal, to understand and study the geoelectrical characteristics of the soil. The main objective of the geophysical work was to delineate and characterize the soil and bedrock in geoelectrical terms in the vineyard's area. The area has patches where high quality grapes are produced and patches which produce mediocre grapes. The geophysical survey aimed to try to understand if there were any correlation between the electrical resistivity of the ground (related with the amount of moisture in the ground) and the quality of the vines and grapes. First six vertical electrical soundings (VES) were done in February 14, 2014. In September 2, 2014, an electrical resistivity tomography was done along the direction defined by the six VES (Profile 1); finally, that same profile was repeated in December 22, 2014, and a new one (Profile 2) was done 11 m southwest of Profile 1 (Fig. 1).

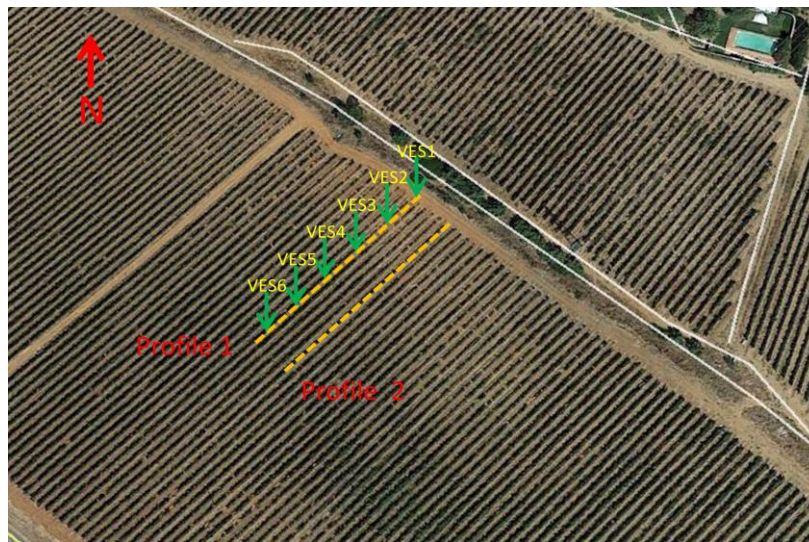


Figure 1: Location of the six vertical electrical soundings (VES1 – VES6) along Profile 1 which was also the orientation of the first electrical resistivity tomography. Profile 2 indicates the location of a second electrical resistivity tomography

The six vertical electrical soundings (VES) were done along the lines of the vines; they were spaced by ten meters and done perpendicular to the direction of Profile 1; the maximum distance between the current electrodes was 40 m. Interpretation of the sounding curves was done considering a 1D ground. In a second phase, electrical resistivity tomographies (ERT) were done; first along Profile 1 and, at a later time, along Profile 2 and repeated along Profile 1 (Fig. 1). For each ERT 40 electrodes were used in a

Wenner configuration; adjacent electrodes were 2 m apart. An inversion code was used for inverting the measured apparent electrical resistivity values into two-dimensional models of ground's electrical resistivity. The models are a representation of the distribution of the electrical resistivity of the ground to depths of about 11 m along profiles 78 m long.

The results of the geoelectrical survey indicate that the quality of the vines and grapes appear to be related with the moisture in the ground, the good vines and grapes being associated with higher moisture content of the ground and so lower electrical resistivities. Further geoelectrical work is in preparation so that an enlarged area can be surveyed.

