

## SOIL ELECTRICAL RESISTIVITY, A NEW AND REVEALING TECHNIQUE FOR PRECISION VITICULTURE

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### **Abstract**

High resolution spatial information of soil electrical resistivity (ER) was gathered to assess the spatial variability patterns of vegetative growth of two commercial vineyards (*Vitis vinifera* L. cv. Tempranillo) located in the wine-producing regions of La Rioja and Navarra, Spain. High resolution continuous geoelectrical mapping was accomplished by an Automatic Resistivity Profiler (ARP) on-the-go sensor with an on-board GPS system; rolling electrodes enabled ER to be measured for a depth of investigation approximately up to 0.5, 1 and 2 meters. Contemporarily, in specific locations within the vineyard plots, soil samples were taken and physical soil analyses were performed in the laboratory. ER was related to spatial and temporal variabilities of a number of physical soil properties, such as salinity, clay mineral content and soil moisture. Resistivity data were interpolated over the whole area by means of the Ordinary Kriging interpolation algorithm, producing raster maps with a 5-m cell size. A correlation matrix was then employed to find out the most significant relationships between ER, soil physical and vegetative growth data. In conclusion, ER is a useful technique to identify areas with similar vegetative status within a vineyard in the frame of precision viticulture.

**Keywords:** *Terroir, soil, electrical conductivity precision viticulture, mapping, zoning, soil spatial variability; electrical resistivity; vineyard variability*