



## **Grapevine water absorption in different soils. A spatio-temporal analysis.**

Luca Brillante (1), Benjamin Bois (1,2), Jean Lévêque (1), and Olivier Mathieu (1)

(1) UMR CNRS/uB 6282 Biogéosciences, Université de Bourgogne, 6 Boulevard Gabriel, F-21000 Dijon, France 2 , (2) Institut Universitaire de la Vigne et du Vin "Jules Guyot", Université de Bourgogne, Rue Claude Ladrey, BP 27877, F-21078 Dijon, France

Hillslope vineyards show complex water dynamics between soil and plants. To gain further insight of this relationship, 8 grapevine plots were monitored during two vintages (2011-2013), on Corton Hill, Burgundy, France. Grapevine water status was monitored weekly by surveying water potential, and at harvest, using  $\delta^{13}\text{C}$  analysis of grape juice. Soil volumetric humidity was also measured weekly, using TDR probes. A pedotransfer function was developed to transform Electrical Resistivity Tomography (ERT) into Soil Volume Water and therefore to spatialise and describe variations in space and time in the Fraction of Transpirable Soil Water (FTSW). During the two years of monitoring, grapevines experienced great variation in water status, which ranged from low to substantial water deficit. With this freshly developed method, it was possible to observe differences in water absorption pattern by roots, in different soils, and at different depth. Great heterogeneity was observed, both laterally and vertically in grapevine water absorption. The contribution of each soil region to plant water status varies according to grapevine water status. It is different between day and night and depends from soil characteristics. It is to our knowledge the first time that water absorption by grapevine is revealed in space (2D) and time, and has therefore allowed a deeper comprehension of plant and soil dynamics in grapevine.