



Soil-plant water status and wine quality: the case study of Aglianico wine (the ZOViSA project)

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The terroir analysis, aiming to achieve a better use of environmental features with respect to plant requirement and wine production, needs to be strongly rooted on hydrometeorology. In fact, the relations between wine quality and soil moisture regime during the cropping season is well established.

The ZOViSA Project (Viticultural zoning at farm scale) tests a new physically oriented approach to terroir analysis based on the relations between the soil-plant water status and wine quality.

The project is conducted in southern Italy in the farm Quintodecimo of Mirabella Eclano (AV) located in the Campania region, devoted to quality Aglianico red wine production (DOC). The soil spatial distribution of study area (about 3 ha) was recognized by classical soil survey and geophysics scan by EM38DD; then the soil-plant water status was monitored for three years in two experimental plots from two different soils (Cambisol and Calcisol). Daily climate variables (temperature, solar radiation, rainfall, wind), daily soil water variables (through TDR probes and tensiometers), crop development (biometric and physiological parameters), and grape must and wine quality were monitored.

The agro-hydrological model SWAP was calibrated and applied in the two experimental plots to estimate soil-plant water status in different crop phenological stages. The effects of crop water status on crop response and wine quality was evaluated in two different pedo-systems, comparing the crop water stress index with both: crop physiological measurements (leaf gas exchange, leaf water potential, chlorophyll content, LAI measurement), grape bunches measurements (berry weight, sugar content, titratable acidity, etc.) and wine quality (aromatic response). Finally a "spatial application" of the model was carried out and different terroirs defined.