SWAP Modeling Results of Monitored Soil Water Moisture Data of Irrigation Experimental Study

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In arid and semiarid zones of the Mediterranean regions a shortage of fresh water resources constitutes some time dramatic problem. In these regions with growing population and the scarce of rainfall irregularity in time during growing season an efficient use of water irrigation became a main challenge for future extensive agriculture development.

In the frame of FP6 Water-Reuse project 516731 project a special field experimentation has been carried out in Alicante Region of Spain (Location UTM X: 693.809, Y: 4.279.922, Z: 626) on a Sandy Typic Xerofkuvent (Soil Survey Staff, 1999), Calcaric Fluvisol (WRB, FAO, 1989).
with aim to investigate water regime in water repellent soils under irrigation of vine Vitus Labrusca.

During field experimentation from 2006 till 2008 on 9 plots, there the same regime of irrigation water application was maintained, a monitoring of weather parameters was done by automatic meteorological station as well as a monitoring of soil water moisture was done by set of data-loggers and TDR-soil moisture sensors ECO-2 installed at different depts.

SWAP model was used to simulate water regime of irrigated plots. Empirical coefficients of van Genuchten–Mualem's equations were calculated by pedotransfer functions derived from HYPRES data base using measured values of bulk density, organic matter content and soil texture. Testing of validity of the use of estimated curves was done by comparison with unsaturated soil hydraulic parameters of water retention and hydraulic conductivity measured in vitro by Wind's method on soil samples. Calibration of SWAP model for each plot was done on measured soil moisture data of irrigation events by adjusting a value of saturated hydraulic coefficient. Verification of the SWAP model was done by full range of experimental data.
Similarity and non-similarity of the water regime at experimental plots as well as results of verification of SWAP model were analyzed