



Functional evaluation of different methods for the determination of soil hydraulic parameters and of their spatial variability using two hydrological models.

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A numerical study is conducted to explore the effects of different methods for the determination of soil hydraulic parameters and of their spatial variability, using two hydrological models of different complexity: SWAP, a widely used model of soil moisture dynamics in unsaturated soils based on Richards equation, and ALHyMUS, a conceptual model of the same dynamics based on a reservoir cascade scheme.

Each model is implemented with three different sets of hydraulic parameters values obtained by applying three common Pedo-Transfer Functions to texture and organic matter measurements collected on a regular grid of 50x50m in an experimental site in Northern Italy (Landriano - PV).

Simulations were run for each model and each parameter set using meteorological inputs measured at the experimental site for the time period 1993 - 2005. Models outputs that were analyzed are the mean annual irrigation depth and the flux at the bottom of the soil profile for a maize cropped field.

Results show that most of the variability of the outputs is due to the choice of methods used for the determination of soil hydraulic parameters. The choice of the model and the spatial variability of the soil parameters are generally less relevant.