Suitability of the instantaneous profile method for the determination of unsaturated hydraulic conductivity in a Xanthic Ferralsol with high clay content at Manaus, Western Amazonia

Wenceslau Geraldes Teixeira[1], Jean Dalmo Marques[1], Max Sarrazin[2] and Paulo Leonel Libardi[3]
[1]EMBRAPA-CPAA, Manaus, Amazonas, Brazil; [2]ORSTOM/INPA, Manaus, Amazonas, Brazil; [3]Universidade de Sao Paulo, Piracicaba, Sao Paulo, Brazil

Several field methods for the direct measurement of the unsaturated hydraulic conductivity of soils are available. Of these, the instantaneous profile method is suitable under conditions of a very deep or absent groundwater table. The procedure is based on the daily measurement of water tension and volumetric water content in different soil layers after saturation of a soil volume devoid of vegetation with water and protecting the soil surface against direct evaporation. In this work, preliminary data about the time course of water tension, measured with tensiometers, and volumetric water content, measured with time domain reflectrometry, during two months after water saturation in soil layers between 10 and 100 cm depth are presented for a Xanthic Ferralsol with high clay content in Western Amazonia. The evaluation of the soil matrix potentials and water content in different soil depths shows that the profile dries out more rapidly near the soil surface compared to deeper soil layers. The results show that the method is promising for the soils under investigation and should be used more frequently for the analysis of their physical properties which differ markedly from those of other regions.