

## **A Combined Method for the Determination of the Transfer and Retention Parameters in Unsaturated Zones**

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The aquifer unsaturated zone constitutes an obliged passage of any superficial pollution. It also constitutes the key of any quantification of the feeding of the groundwater. Water flow, a propagation agent of pollutants from and towards the groundwater, is governed by the knowledge of the two functions of transfer and retention. These two parameters which are hydraulic conductivity and characteristic moisture are functions of the water content.

Knowledge of the soil water retention curve, expressing the relation between water pressure  $h$  (cm) and water content ( $\text{cm}^3/\text{cm}^3$ ), is of prime importance in many field studies dealing with irrigation and drainage management.

Optimization of the parameters describing the soil hydraulic functions and in which is the volumetric water content,  $h$  is the soil water pressure head, and  $K$  is the unsaturated hydraulic conductivity, in a transient-flow is a promising method to derive soil hydraulic information.

Some authors tried to determine these functions concerning measures as well as analytical determination. Laboratory measurements of the retention curve based on desorption of initially saturated soil samples are often not applicable under field conditions. Hence, in situ measurements based on simultaneous monitoring of soil water content and water pressure are preferable.

The object of this paper is to show a determining method of these parameters, which is a combination of particle size distribution method, in situ method and classical laboratory method.

This method was applied to the unsaturated part of the Bruxellien aquifer at the right of the lake of Louvain la Neuve in Belgium and has given satisfactory results. (The error of adjustment by the model of Van Genuchten is about the percent).

Key word: Unsaturated zone, hydraulic parameters, artificial recharge, Louvain-La-Neuve, Bruxellien.