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# Infiltration in hydrophobic porous media; quantification and modelling

Claude Hammecker (1) and Siwaporn Siltecho (2)

(1) Institut de Recherche pour le Développement, UMR Eco&Sols, Montpellier, France (claude.hammecker@ird.fr), (2) Land Development Department, Khon Kaen, Thailand (aom_siwaporn@hotmail.com)

Though water Infiltration in hydrophobic soils has been extensively studied by many authors the actual modelling of this process is rarely tackled directly.

The modelling of water infiltration into soils with hydrophobic properties is often performed by modifying the unsaturated hydraulic parameters of soil, but without taking into account explicitly the water-repellency. The aim of this paper is to show the performance of a simple geometrical pore model computing water infiltration into hydrophobic soil. The model composed of a stack of spherical elements defined by the actual pore radius ($R$) and the radius of the pore access ($r_a$). The model showed coherent infiltration curves and the common infiltration parameters of Philip equation, sorptivity ($S$) and constant rate infiltration ($A$) were comparable to experimental results.

Prospective modelling showed that increasing the wetting contact angle ($\theta_w$) contributed to decrease sorptivity $S$ but also to increase constant infiltration rate $A$. Moreover for high values of contact angle ($\theta > 90°$), superficial ponding pressure is necessary to initiate infiltration. The model also showed that potential infiltration instability and preferential flow might arise for from high hydrophobicity ($\theta_w > 90°$), even considering homogeneous porous network.