



Uncertainties in modelling deep percolation

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Lysimeter research became more and more important during the past few years accompanied by a huge progress in lysimeter technology. Data from lysimeter investigations are used for the assessment of different kinds of land use concerning groundwater pollution as well as for calibration and validation of ecological models. Usually the dynamic of the upper most 1.5 – 2.0 m of a soil profile are recorded by a lysimeter. The investigated materials are fine sediments mostly and sometimes some decimeters of a coarse-grained material are included at the lower end of a lysimeter. The parameterization of the water retention and water transport characteristics of these materials is based on data from lysimeters in many cases.

Modelling deep percolation for an aquifer with a groundwater table at 5-10 m below soil surface, using the Richard's equation in combination with soil physical characteristics of coarse-grained material, which are estimated from e.g. lysimeter studies, leads to a problem because of a temporal gap between the arrival of the infiltration front at the groundwater table and the measured groundwater dynamic at an observation well.

These shortcomings may be met by stepwise modification of the soil physical characteristics of the coarse-grained material as needed or following a kinematic wave approach, as sometimes proposed for preferential flow. Also other solutions may be possible. Some examples regarding this gap will be presented.