



Modelling of a Tracer experiment (Bromide) at the lysimeter Wagna/Austria with MIKE-SHE

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Data of a tracer experiment with Bromide at one of the three lysimeters in Wagna/Austria are used to test the unsaturated zone solute transport model in MIKE-SHE. On April 4th, 2005 50 mg/l of Bromide were applied on the lysimeter operated with conventional farming. At this time the lysimeter was covered with bare soil until the start of the cultivation of pumpkin one month later. Concentrations at the lysimeter bottom (180 cm depth) were measured and, after break-through, plant uptake was measured to quantify mass recovery. The model using the Richards-Van Genuchten-Mualem approach is setup by comprehensive data of vegetation and soil hydraulic properties available at the lysimeter. Water movement simulation in the unsaturated zone is tested against measured seepage rates at the lysimeter bottom and soil water contents in different soil depths in a period of five years. A sensitivity study shows that, particularly in the quaternary gravel zone two different parameter sets are necessary to represent the different dynamics of water content and seepage. With both two sets the general dynamics of the tracer experiment are simulated well. However, the early rapid rise of the measured concentrations could not be represented by either parameter set, which indicates a complex pore system consisting of different flow paths in the gravel zone, e.g., a system of matrix flow and macro-pore flow.