



Saturated hydraulic conductivity as parameter for modeling applications - comparison of determination methods

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Saturated hydraulic conductivity is broadly used to parametrize physical characteristics of soil. Many methods for its determination have been developed, but still no standard has been established. For the interpretation of results it has to be considered that different methods yield varying results. In this study, values for saturated hydraulic conductivity were measured directly by the falling head lab-method as well as derived indirectly by model fitting to data from hood-infiltrometer experiments in the field and evaporation experiments in the lab. Successive sampling of the exactly same soil body for all three methods ensured the highest possible comparability. Additional physical soil parameters were measured and tested for their suitability as predictors in pedotransfer functions.

The experiments were conducted all through the vegetation period 2016 at 4 sites in Lower Austria and Saxony, Germany. Sampled soils had a sandy loam or loamy silt texture and were cultivated with regionally common annual field crops. Subsequently, the results were evaluated with regard to their further use as key parameter in the expression of hydraulic soil properties. Significant differences were found between the evaporation method and the two other methods, where the former underestimated the saturated conductivity considerably. Consequently, an appropriate procedure for the determination of saturated hydraulic conductivity was formulated which combines results of hood infiltration and falling head method.