An improved scheme for classifying susceptibility to preferential flow

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The ability to reliably predict the occurrence and strength of preferential flow in different soils and land use systems would be of great benefit in environmental planning and management at multiple spatial scales, from field to catchments and regions. We recently proposed a simple classification scheme for predicting the susceptibility of soil horizons and pedons to macropore flow, designed to support predictive modelling (Jarvis N.J. et al., 2009. A conceptual model of soil susceptibility to macropore flow. Vadose Zone Journal, 8: 902-910). The scheme, which takes the form of a decision tree, was successfully validated against a small dataset of solute transport experiments. However, in its present form, it is strongly biased toward European agricultural soils, since it was developed to support pesticide risk assessment in the EU. In this poster, we propose an improved version of the classification scheme, which is much broader in scope, with relevance for a much wider range of soils worldwide, including those with clay mineralogies that limit the development of soil macro-structure and restrict macropore flow (e.g. Ferralsols and Andosols). The new scheme is tested in a literature meta-analysis exercise, making use of the temporal moments of solute breakthrough curves derived from fits of the mobile / immobile model to steady-state experiments on short laboratory columns.