

Predicting soil water retention characteristics for Vietnam Mekong Delta soils

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Abstract Soil hydraulic properties (e.g. soil water retention and hydraulic conductivity) are very important for agricultural and environmental management practices. However, the direct field or laboratory measurement of these characteristics is costly, laborious and time-consuming. Therefore, their indirect estimation from available and easily measured soil properties has received great interest. Pedotransfer functions (PTFs) are being used as a well-known indirect method for determining hydraulic properties from basic soil properties (e.g. soil texture, bulk density and organic carbon content). In this study, we derived two types of PTFs, point and pseudo-continuous functions, for estimating moisture retention characteristics of soils in the Mekong Delta of Vietnam. The data of 120 samples were collected from agricultural fields distributed over the area. The results reveal that point PTFs outperformed pseudo-continuous functions. Moreover, the plastic limit, on top of classical predictors, appears to be a promising variable to predict soil water retention, especially in the wet moisture range.

Key words pedotransfer functions; soil water retention; pseudo-continuous PTF; plastic limit; tropical delta soils