

PREDICTION OF SATURATED HYDRAULIC CONDUCTIVITY OF SEMI-ARID RED AND LATERITIC LOWLAND PADDY SOILS USING MEASURED SOIL PROPERTIES

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ABSTRACT

A saturated hydraulic conductivity of the semi-arid red and lateritic lowland paddy soils was assessed on the measured soil variables using modern statistical tools such as correlation matrix, multiple regression equations and principal component analysis (PCA). Multiple regression equations and PCA indicated the sand fraction as the key indicator in predicting a large variation of the saturated hydraulic conductivity of the soils. However, organic carbon, bulk density, particle density, electrical conductivity, cation exchange capacity, water holding capacity, porosity, and soil pH had significant contribution in explaining the variability of the saturated hydraulic conductivity. Model using minimum data set (MDS) as independent variables were, however, less predictive than PCA where organic carbon could function as the sole indicator in predicting the variance of the saturated hydraulic conductivity of soils. These unorthodox techniques may provide an alternative way of estimating the saturated hydraulic conductivity indirectly from the easily measured basic soil properties.

KEYWORDS: *Saturated Hydraulic Conductivity, Red and Lateritic Soil, Regression, Principal Component Analysis, Minimum Data Set*

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