

Investigation of Spatial Variability Soil pH in the Wet Zone of Sri Lanka

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Exploring the spatial variability of soil pH and subsequent mapping are important for soil management and land use planning. This study assessed the spatial variability of surface soil pH of the wet zone of Sri Lanka and external factors determining the variability. Four hundred and three surface soil (0-30 cm) samples obtained across the wet zone were used in this study. Air-dried soil samples were sieved using a 2 mm sieve and analyzed for pH by preparing a 1:5 soil to water ratio suspension. Exploratory data analysis conducted using PASW statistics 18 revealed a large variability of soil pH within the wet zone, which ranged from 3.0 – 8.8 (coefficient of variation = 16.71%). Thus, soils of the wet zone of Sri Lanka are varied from strongly acidic to strongly alkaline in pH. Average soil pH revealed that majority of the soils are slightly acidic (pH=5.4). Distribution of soil pH values did not show regional patterns within the wet zone. Among external factors considered in this study, only precipitation showed a negative relationship with the soil pH ($r = -0.30$). Increased precipitation leads to leaching of basic cations such as Ca^{+2} and Mg^{+2} from the soil system, enriching hydronium ions thus decreasing the soil pH. Other external factors, namely elevation and temperature did not show a relationship with the variability of soil pH ($r = 0.04$ and -0.007 , respectively). Analysis of soil pH within different land uses revealed significantly lower pH values in land uses, namely tea lands, paddy lands, and rubber lands. This study revealed considerable variability in soil pH between different great soil groups and agro ecological regions of the wet zone. It was concluded that wet zone of Sri Lanka exemplifies a large spatial variability in pH, which needs site-specific management to enhance crop production.

Keywords: External factors, Land use, Soil pH, Wet zone

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