

CHEMICAL, PHYSICAL AND BIOLOGICAL CHARACTERIZATION OF SOILS IN DIFFERENT DRAINAGE BLOCKS AT THE RESEARCH FARM AT *PULIYANKULAMA*, ANURADHAPURA

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Soil fertility evaluation provides a comprehensive understanding of the major soil characteristics of arable land with a quantitative estimate of major and micronutrients. This soil fertility survey was conducted to investigate and compare the major soil characteristics in different drainage blocks of the nine-acre land at the Faculty of Agriculture, Rajarata University of Sri Lanka. Soil samples were collected from the surface (0–15 cm) and subsurface (15–30 cm) soil just before land preparation from different blocks of land representing well-drained, moderately drained, and poorly drained drainage classes with three replicates. Soil physical, chemical and biological characteristics were studied using standard analytical procedures. Data analysis was done by the RCBD method using the Minitab software. The mean separation was done using the Tukey method. Soil exchangeable K, total P, microbial biomass, organic matter and organic carbon were significantly varied ($p < 0.05$) among the drainage classes as well as two depths. Soil total N, cation exchangeable capacity (CEC), exchangeable Ca, pH, available N, silt%, clay%, and sand% were not significantly different ($p > 0.05$) among the two depths while significantly different ($p < 0.05$) across the drainage classes. Soil total K was significantly different ($p < 0.05$) over two depths, but they were not significantly different ($p > 0.05$) among the drainage classes. However, soil exchangeable K, soil organic matter content, and organic carbon content were significantly greater ($p < 0.05$) in surface soil than subsurface soil. Soil microbial biomass, total P, Mg and total K were significantly greater ($p < 0.05$) in subsurface soil than in surface soil. Soil total P, available N, pH, and CEC were significantly greater ($p < 0.05$) in poorly drained soils than well-drained soil. Poorly drained and well-drained soil drainage classes depicted comparatively greater fertility status than the moderately drained soils referring to major soil fertility parameters.

Keywords: Soil analysis, Soil fertility, Soil nutrients, Soil properties