

## **DEVELOPMENT OF A SOIL FERTILITY MAP AND A NUTRIENT MANAGEMENT PLAN FOR AGRICULTURE FACULTY FARM, PULIYANKULAMA**

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The farm located at the Agriculture Faculty premises of the Rajarata University of Sri Lanka covers about 36 acres of land including uplands and lowlands. It is mainly used for farm practice course of the undergraduates and field experiments. However, no systematic soil investigation has been conducted to assess soil fertility parameters of the farm. Therefore, a study was conducted to assess and map important soil fertility parameters of the faculty farm and propose a nutrient management plan to optimize farm productivity. Soil samples were collected randomly at 0-15 and 15-30 cm depths from different blocks of the farm and analyzed to determine Soil pH, EC, Available N, Available P, Exchangeable K, Cation Exchange Capacity (CEC), Organic Matter (OM), Trace Elements and the Soil Texture. Map preparation was done using Arc GIS 10.2 and Google Earth software. Point sample values were interpolated to the study area using Inverse Distance Weighting technique in Arc GIS 10.2. Results revealed that soil pH varied from 6.7 to 8.1 indicating neutral to alkaline nature of soil. Soil EC values were within the range from 0.21 to 0.88 dS/m showing no potential for salinity development in both uplands and lowlands. The highest soil P level of 37.5 mg/kg was recorded in the block assigned for students' farm practice course. The same block indicated the highest exchangeable K level of 720 mg/kg as well. The reason could be attributed to the continuous application of fertilizers for different field crops. The lowest soil P and K levels of 1.6 and 32.9 mg/kg were observed in the paddy field. The available soil N level varied from 14 – 46 mg/kg indicating low to moderate N content in the soil. However, moderate to fairly high OM content (1.4 – 2.8 %) was reported in all blocks of the land. The CEC of the soil varied from 4.3 to 8.1 cmol<sub>c</sub>/kg showing less potential to retain cationic nutrient when soil is subjected to leaching. The results of the soil analysis infer that, there is a potential to cut down about 50% of P and K fertilizer application for the land block allocated for farm practice course for next two seasons. The map developed using existing soil parameters would be a supporting tool for decision making process of soil fertility management in the faculty farm.

**Keywords:** Nutrient management, Soil analysis, Soil mapping, Soil sampling