VARIATION OF SOIL PROPERTIES OF LOWLAND RAINFED AND IRRIGATED PADDY FARMING IN LOW COUNTRY INTERMEDIATE ZONE

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Irrigated and rainfed paddy farming systems are commonly practiced in Low Country Intermediate Zone (LCIZ) of Sri Lanka. According to literature, the mean yield of rainfed system (3.2 t ha^{-1}) is very low compared to mean yields of minor irrigated (3.8 t ha^{-1}) and major irrigated (4.8 t ha^{-1}) systems. It is a fact that soil factors are more influential on crop yield. This study was conducted to evaluate the variation of soil chemical and physical properties and their effect on rainfed and irrigated paddy farming in LCIZ. Soil samples were collected from both systems separately and analyzed for soil properties. Soil moisture in rainfed fields and daily water levels in irrigated fields were also recorded throughout the season. Thematic maps were prepared for different soil parameters using GIS technique. Soil analysis indicated that available P, exchangeable K and Zn were lower than the respective critical values in both fields. Soil EC levels in both fields were less than 0.125 ds m^{-1} indicating better condition for rice cultivation. Soil pH of entire rainfed fields and 70% of irrigated fields were less than 5.5. Almost all the fields showed soil organic matter content less than 3%. Soils of rainfed fields were more compacted and showed higher bulk density values (>1.5) than that of irrigated (<1.5). In irrigated fields, soil texture varied from sand to loamy sand whereas in rainfed fields soil texture was mainly loamy sand, sandy loam and sandy clay loam. Results suggested that soil fertility of irrigated and rainfed systems are generally poor and need to adopt remedial measures. Site specific fertilizer recommendations and adding organic matter may useful to improve soil fertility and moisture retention in both systems.

Key words: Irrigated paddy, Rainfed paddy, Soil properties