

COMPARISON OF SOIL PROPERTIES BETWEEN ORGANIC AND CONVENTIONAL RICE FARMING SYSTEMS IN SRI LANKA

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Organic farming is a production system that sustains the health of soil. However, some studies revealed that in practice this is not always true. This study was conducted to compare soil properties between organic and conventional rice farming systems in Sri Lanka. Soil samples were collected from rice farming fields located in Rice Research and Development Institute Bathalagoda and two farmer fields at Rambawa and Eppawala where both organic and conventional systems are practiced in same *yaya* area. All three locations have more than five years of farming history with totally organic inputs. Soil samples drawn from 0 - 15 cm depth of organic and conventional rice fields were analyzed for chemical, physical and biological properties. Data analysis was done by two factor factorial model using Statistical Analysis System. Results revealed that soil pH, available NO₃⁻-N and exchangeable K were significantly lower ($p < 0.05$) in organic fields compared to conventional fields. However, organic fields showed significantly higher ($p < 0.05$) soil organic matter, NH₄-N and Cation Exchange Capacity (CEC) levels. Higher soil organic matter content may be the reason for increased CEC level and hence high retention of NH₄-N found in the soils of organic fields. Soil EC, available P and total N levels were not significantly different between ($p > 0.05$) organic and conventional fields. Heavy metals (As and Cd) were not detected in both organic and conventional fields. Soil bulk density, biomass C and microbial activity were also not significantly different ($p > 0.05$) between two farming systems. The results of the study conclude that increased soil organic matter content reported in organically managed rice fields enhances soil fertility by improving CEC of the soil.

Keywords: Conventional agriculture, Organic farming, Rice farming in Sri Lanka, Soil chemical properties