

NUTRIENTS AND TRACE ELEMENTS LEACHING BEHAVIOURS IN RICE GROWN ALFISOLS UNDER DIFFERENT INPUT MANAGEMENT SYSTEMS: THE SECOND YEAR IN TRANSITION

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Leaching of nutrients and other trace elements are the great concerns in ecological and economical perspectives. This study was conducted to investigate leaching behaviours of major nutrients and the selected trace elements under conventional [Department of Agriculture (DOA) recommendation], reduced (50% of DOA) and organic Input Management Systems (IMSs) in rice grown Alfisols. Field experiment was established under Randomized Complete Block Design in the farm field, Faculty of Agriculture, Rajarata University of Sri Lanka. Leachate samples were collected at initial, seedling, panicle initiation, 50% flowering and harvesting stages from the rice growing plots having four replicates from each under three different IMSs. The leachate samples were analysed for nutrients and trace elements using standard methods. Data analysis was performed using the mixed procedure of SAS 9.0 software. Leaching behaviours of NO_3^- -N, NH_4^+ -N, K^+ , Ca^{2+} , Mg^{2+} , Na^+ , and Pb^{2+} , were significantly different among three different IMSs ($p < 0.05$). Significant temporal variations in leaching behaviours of the same elements were observed over growing season ($p < 0.05$). A considerable variation was observed in leaching behaviour of Dissolved Reactive P (DRP) among three IMSs over growing season although variation was not statistically significant ($p > 0.05$). Leaching behaviours of each investigated element could be explained by type of IMS, irrigation water supplying patterns over growing seasons and nutrients uptake and secretion by root system of rice plant. The different nutrient leaching behaviours in Alfisols under different IMSs emphasize the high relevance of eco-friendly and economical nutrients management on the basis of the suitable IMS.

Key words: Alfisols, Input management systems, Leaching, Plant nutrients, Trace elements