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

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The leaching of nutrients and other trace elements is considered one of the important concerns in ecological and economic perspectives in crop production. Hence, this study was conducted to evaluate the leaching behaviour of major nutrients and other trace elements under conventional as recommended by (Department of Agriculture (DOA) for rice), reduced (50% of DOA recommendation + 50% organic) and organic input management system (IMSs) in rice grown in Alfisols. A field experiment was established under Randomized Complete Block Design (RCBD) in the research farm field, Faculty of Agriculture, Rajarata University of Sri Lanka, during the 2020/2021 *Maha* season. Leachate samples were collected prior to crop establishment, seedling, panicle initiation, 50% flowering, and harvesting stages from the rice-growing plots having four replicates from each under three different IMSs. Porous PVC tubes were installed in the middle of each treatment plot just below the plough layer to collect leachate. The leachate samples were analyzed for nutrients and trace elements using standard analytical methods. Data analysis was performed using the mixed procedure of SAS 9.0 software at $p \leq 0.05$. The mean separation was done using Tukey's test. The Leaching behaviours of Dissolved Reactive Phosphorus (DRP), NO_3^- - N, and K^+ were significantly different among three different IMSs ($p<0.05$). Significant temporal variations in leaching behaviours of the pH, EC, TDS, DRP, NH_4^+ -N, Ca^{2+}, Mg^{2+}, K^+, SAR, Na^+, As, and Pb were observed over the growing season ($p<0.05$). However, there was no significant difference over time in NO_3^--N and alkalinity. The different nutrient leaching behaviours in Alfisols under different IMSs emphasize the high relevance of eco-friendly and economical nutrient management based on the suitable IMSs of paddy cultivation.

Keywords: Alfisols, Input management systems, Plant nutrients, Trace elements