

# EFFECT OF DIFFERENT INPUT SYSTEMS ON NUTRIENT LEVELS AND TRACE ELEMENTS OF RICE PLANT

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A balanced supply of essential nutrients and trace elements is one of the most critical factors in increasing rice crop yields to increase the world's current rice demand. Hence, this study was conducted to investigate the bioaccumulation behaviours of major nutrients and the selected trace elements under conventional [Department of Agriculture (DOA) fertilizer recommendation for rice, 2013], reduced (50% DOA recommendation + 50% organic) and organic Input Management Systems (IMSs) at different growth stages of rice. A field experiment was conducted during the 2020/2021 *Maha* season, and treatments were established under Randomized Complete Block Design in the farm field, Faculty of Agriculture, Rajarata University of Sri Lanka. Leaf samples were collected at seedling, panicle initiation, 50% heading and harvesting stages from the rice-growing plots having three replicates from each under three different IMSs. All total nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg) and trace elements (Mn, Cu, Fe, Zn, As, Cd and Pb) were determined using standard analytical procedures. Data were statistically analyzed by mixed procedure, and mean separation was performed by Tukey's test at 5% probability level. Results indicate that leaf N, P, K, Mg, Ca, Mn, Zn, and As contents in different rice growth stages were significantly different ( $p < 0.05$ ) but leaf tissue Na, Fe, Pd, and Cd contents were not significantly different ( $p > 0.05$ ) among IMSs. Conventional IMS has resulted in the highest total N, P, and Mn during panicle initiation and 50% heading stages compared to the other two IMSs. In the panicle initiation stage, reduced IMS recorded the highest total Mg, Cu and Fe contents. The differential nutrient quantities of rice plants under different IMSs emphasize the high relevance of eco-friendly and economical nutrient management based on the acceptable IMS.

**Keywords:** Growth stages, Input management systems, Plant nutrients, Rice, Trace elements