EFFECT OF DIVERSE INPUT MANAGEMENT SYSTEMS ON NUTRIENT LEVELS AND TRACE ELEMENTS OF RICE PLANT

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Farmers apply heavy loads of inorganic fertilizers to obtain high yield. However, over application of inorganic fertilizers, led to severe environmental hazards and directly affect the human health. Hence, this study was conducted to investigate the impact of different input management systems (IMSs) on bioaccumulation of nutrients and trace elements at different growth stages of rice. Field experiment was conducted during 2019/2020 *Maha* season using three IMS as treatments i.e. conventional [Department of Agriculture (DOA) fertilizer recommendation for rice], reduced (50% DOA recommendation + 50% organic) and organic (100%). Treatments were arranged in Randomized Complete Block Design (RCBD) with three replicates. Leaf samples were collected at seedling, panicle initiation, 50% heading, and harvesting stages from three different IMSs. Total nitrogen (N), total phosphorus (P), total potassium (K), calcium (Ca), magnesium (Mg), and certain trace elements (Mn, Cu, Fe, Zn, As, Cd, and Pb) were determined. Data were statistically compared by mixed procedure and Tukey's HSD test for mean separation using SAS. According to the results; conventional IMS has given the highest total N, Zn, Mn and Na during panicle initiation compared to other two IMS. In seedling stage, reduced IMS recorded highest total P, while total K, Mg and Fe were highest at panicle initiation stage. However, organic IMS recorded the lowest Ca content over reduced and conventional IMS. Leaf concentrations of Cd and Pb were negligible for all growth stages. Overall, it could be concluded that, the reduced IMS performed better in comparison to other IMSs. Further, reduced IMS facilitates better nutrient uptake in rice plants through its combined approach of organic and inorganic fertilizers. Future studies are needed to evaluate reduced IMS to cut down inorganic fertilizer usage in rice cultivation.

Keyword: Growth stages, Input management systems, Rice cultivation, Soil nutrients, Trace metals