

NUTRIENT AND TRACE ELEMENT LEACHING IN PADDY SOILS UNDER DIFFERENT INPUT MANAGEMENT SYSTEMS: THE FIRST YEAR IN TRANSITION

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Detailed study of nutrient leaching provides a strong basis for the formulation of eco-friendly and economical site-specific fertilizer recommendations. Hence, this study was conducted to evaluate the leaching behaviour of nutrients and trace elements under conventional (Department of Agriculture recommendation), reduced (50% of DoA) and organic input management systems (IMs) in rice grown in Low Humic Gley (LHG) soils. Leachate samples were collected from the field plot experiment conducted at the Faculty of Agriculture, Rajarata University of Sri Lanka. Porous PVC tubes were installed in the middle of each treatment plot just below the plough layer to collect leachate. The leachate samples were analysed for nutrients and trace elements using standard methods. Data were analysed following the mixed procedure. The results showed that NO_3^- -N and Arsenic (As) in leachate were significantly different ($p < 0.05$) among different IMs. The highest and lowest amount of NO_3^- -N leaching throughout the growing season were observed in conventional and organic rice plots respectively where the values were significantly different at before sowing stage while not significantly different ($p > 0.05$) after sowing up to panicle initiation stage and 50% flowering stage. The higher As leaching was observed in conventional fields, whereas, it was comparatively lower in reduced and organic fields before sowing. Comparatively lower As leaching was observed after sowing stage, while as leaching was not detected at flowering stage in all IMs. The pH, alkalinity, NH_4^+ -N, dissolved reactive P, exchangeable K^+ , Na^+ , Ca^{2+} , Mg^{2+} , Cd, Pb and Sodium Absorption Ratio were not significantly different among different IMs, while significantly different over time. Moreover, Electrical Conductivity and Total Dissolved Solids were not significantly different among different IMs as well as different time scales of the studied period. Different nutrients leaching behaviours in LHG under different IMs emphasize the high relevance of eco-friendly and economical specific nutrient management on the basis of IMs.