Tracking Phosphorous Forms Using Enzymatic Hydrolysis

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Accurately characterizing phosphorous (P) forms in the environment is essential in the development of effective P remediation and management strategies and for understanding the long-term role of P in eutrophication, (He *et al*., 2008). In this study, enzyme labile P species were tracked in a 10 week, time series, over three amended soil conditions (surface manure application, mixed manure application, and no manure application). Initial soil and manure samples were collected in August 2008 from an agricultural field and poultry layer facility in Salisbury, Vermont. The soil was collected from the surface to a depth of 30.5 cm on a 3-12% slope and had received nearly 80 years of annual poultry manure-amendment. Fresh manure was collected from an exterior storage pile next to the layer facility. Samples were extracted with 0.25M NaOH-0.05M EDTA and a modified enzymatic P assessment assay was applied to soil samples taken from the three amended soil conditions. Labile monoester P, diester P, and inorganic P were quantified colorimetrically, using a modified molybdenum blue technique. Results indicated an increase of inorganic (P_i) in the mixed manure application and no measurable change of P_i species in the surface manure application compared to the control soils (no manure application). The transformation of stable organic P could be an important mechanism for the characterization of labile and immobile P in manure amended soils.

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