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Effect of Manure Types and Period of Incubation on Phosphorus-Sorption Indices of a Weathered Tropical Soil

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Application of animal manures with inorganic phosphate (PO_4) fertilizer is proposed as one of the management options to improve availability and solubility of applied phosphate in weathered soil. We studied the effects of poultry, cattle, and goat manures at different incubation periods (0 to 120 days) on phosphorus (P) sorption indices of a weathered sandy clay loam soil. The soil P adsorption isotherms conformed to the H curve. Generally, the soil P-sorption efficiency decreased as the number of days of incubation increased irrespective of manure amendments. Manure application reduced the P-sorption efficiency of the soil; the lowest P-sorption efficiency was observed after 30 days of incubation. The data conformed to adsorption models in the order Temkin > Freundlich > Langmuir. Cattle, goat, and poultry manures reduced the adsorption constants in all models. Standard phosphate requirement and P-buffering capacity were also reduced with the application of the manures.

Keywords Animal manures, incubation period, phosphate sorption