Sorption Dynamics of Organic and Inorganic Phosphorus Compounds in Soil. (S11-berg196611-oral)

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Abstract:

Phosphorus (P) retention in soils is influenced by the source of P added and the potential impact of individual P sources on the sorption of other P compounds. Our objectives were to quantify P sorption by benchmark soils from Indiana, Missouri, and North Carolina when P is added as inorganic P ($NaH_2PO_4*H_20$) or organic P (inositol hexaphosphate or adenosine triphosphate) and to determine whether soil P sorption is competitive when organic and inorganic P sources are added simultaneously. A 24-hour P sorption isotherm (0.01 M NaCl, 1:25 m:v, 25°C) was performed with six P concentrations (0, 6.45, 16.13, 32.26, 161.3, and 323 micro mol P L^{-1}) for all P sources. To determine competitive sorption between inorganic P and the organic P sources, a similar isotherm was completed with seven P concentrations (0, 6.45, 16.13, 32.26, 161.3, 323, and 646 micro mol P L^{-1}) with equimolar P contributions from inorganic and organic P. Solutions were corrected for ionic strength differences using NaCl, and the pH was adjusted to the soil water pH of the soil. Isotherm supernatants were filtered (0.45 micro m) and analyzed for pH and total P using standard protocols, while orthophosphate and the organic P compounds of interest were assayed using ion chromatography. Our preliminary data show that inositol hexaphosphate retention was much greater than inorganic P in all soils.

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Session Information: Monday, November 3, 2003, 12:55 PM-3:00 PM

Presentation Start: 2:15 PM

Keywords: phosphate sorption; organic phosphorus; inositol hexaphosphate; orthophosphate