Alleviating Acid Soil Infertility through the Use of Green Manures and Natural Phosphate Fertilizers. (S04-bah052916-Oral)

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Abstract:

Natural inorganic and organic materials have high potential for improving acid soils, but more information is needed for their effective management. A factorial combination of cover crop green manures (CGMs) and phosphate rocks (PRs) on a Typic paleudult was evaluated using incubation and glasshouse trials. The CGMs were legumes (Calopogonium caeruleum, Centrosema pubescens, Pueraria, phaseoloides)and a non-legume (Imperata cylindrica); and the PRs were from China (CPR) and Algeria (APR). Mineral N, Olsen P, pH and exchangeable cations were monitored for 32 weeks, and nutrient uptake in 3 cuttings of Setaria sphacelata during 19 weeks after treatment (WAT). The legume CGMs alone or plus PRs, were more effective. Soil ammonium-N buildup was rapid and highest under C. caeruleum (~ 40% CGM-N at 8 WAT), but < 2% from Pueraria and Centrosema even at 16 WAT. Yet, they elevated pH by 1.5-2.5 units at 8 WAT, whilst Olsen P was mostly increased after 16 weeks. Also, the CGMs and CGMs + PRs augmented uptake of N 2-3 times, K > 4-fold, and P twice with 60 to > 80% P derived from CGM or CGM + PR compared to 30-40% from the PRs alone. Thus CGMs + PRs can correct acid soil infertility.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 2:45 pm

Keywords:
Long-term incubation study, P-32 Isotope dilution technique, Soil ammonium-N accumulation, P availability and uptake