Phosphate Acquisition and Cycling by Fallow Legumes Fertilized with Phosphate Rock. (A06-smithson065410-Poster)

Authors:

- P.C.Smithson* - *Berea College*
- J.M.Kimiti - *Kenya Forestry Research Institute*

Abstract:

Short-duration leguminous fallows using Crotalaria or Tephrosia species alleviate N deficiency in western Kenya, but P deficiency is still severe. Legumes in combination with unreactive local PRs may improve PR effectiveness through enhanced dissolution of PR or improved cycling of organic P. We tested Ugandan Busumbu PR (BPR, 14% total P and 0.3% neutral ammonium citrate soluble P) in combination with leguminous fallows. All plots received equalized N inputs by additions of urea where necessary. Phosphorus as BPR or TSP was added at 100 kg P ha-1. Both BPR and fallows alone increased maize (Zea mays) yields modestly, but the legume-PR combination was even better. Several routine soil tests showed no enhanced P availability. Sequential P extraction showed no evidence of enhanced PR dissolution. Microbial biomass P was unaffected by treatments. Acid phosphatase activity was significantly higher after fallows, and was slightly higher in the rhizosphere compared to bulk soil. Current evidence therefore suggests that enhanced organic P cycling is one means by which legume fallows improve maize yields in P-deficient soils.

Corresponding Author Information:

Paul Smithson
Berea College
CPO 2064
Berea, KY 40404

phone: (859) 985-3716
fax: (859) 985-3303
e-mail: paul_smithson@berea.edu

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 2:00-4:00 pm
Poster Board Number: 727

Keywords:

agroforestry, phosphate rock, improved fallow, Kenya