Impact of Manure Application and Crop Rotation on the Distribution of Carbon, Nitrogen, and Phosphorous Among Soil Organic Matter Pools. (S03-dell131718-Poster)

Authors:

- C.J.Dell - *USDA-ARS, University Park, PA*
- W.Priddy - *USDA-ARS, University Park, PA*

Abstract:

The impact of manure additions on the size of various pools of soil organic C and N has not been extensively quantified. Four crop rotations (continuous corn; corn/soybeans; 4 years corn/4 years alfalfa; and, corn/oats/wheat/clover) have been maintained since 1982 with two fertility treatments. Plots receive either all commercial fertilizer or manure to meet P requirement plus supplemental mineral N fertilizer. Long-term (200 day) incubations were conducted and quantities of mineralized C and N were fit to a three-pool, expediential decay model to estimate the size of three organic matter pools with different turnover rates (active, slow, and resistant). Total C and N, inorganic N, and acid resistant organic C and N were determined. Additionally, pools of labile C and N were estimated from C losses after digestion with KMnO4. Total C and N concentrations increased by 10 to 25% when manure was applied with the exception of the corn/wheat/oats/clover rotation. Preliminary analysis of mineralization data indicates that manure application also caused similar increases in C and N content of each of the three organic matter pools.

Corresponding Author Information:

Curtis Dell
USDA-ARS
USDA/ARS/PSWMRU, 3702 Curtin Road
University Park, PA 16802-3702

phone: 814-863-0984
fax: 814-863-0935
e-mail: cjd21@psu.edu

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 9:00-11:00 am
Poster Board Number: 2206

Keywords:

C, N, P cycling, manure application, organic matter pools, crop rotation