# The Economics of Managing Soil Carbon and Nitrogen Pools as Precursors of Soil Quality. (S03-harwood134532-Oral)

**Authors:**

- R.R.Harwood - *Michigan State Universitiy*
- J.E.Sanchez - *Michigan State University*
- J.Smeenk - *Michigan State University*
- A.M.Fortuna - *Michigan State University*
- F.W.Warner - *Michigan State University*
- G.W.Bird - *Michigan State University*

## Abstract:

Long-term trials show changes in total soil C to be related to C inputs, soil texture, and tillage. Management of short-term C and N pools is important in improving soil quality. With fall moldboard plowing, sugar beet rotations on a silty clay loam showed a high correlation between number of years of corn in the rotation and C equilibrium level, but lengthening the rotation period between sugar beet crops reduced net income. Reduced tillage in sugar beet rotations led to 10% increases in soil C (0-10 cm) and 40% increases in the 70 d mineralizable C pool compared to moldboard plowing. Mineralizable N increased by 30-40% with identical N inputs for the different tillages. Net returns were higher under reduced tillage. Rotations with compost significantly increased the mineralizable pools of C and N on a sandy loam. The 70 d C pool showed a high correlation with total C. Ratios of non-plant parasitic to plant parasitic nematodes are highly related to the short-term C and N pools and have major promise for nematode management.

Within rotation and tillage regimes, major increases in soil quality required careful management to achieve comparable net economic returns.

**Corresponding Author Information:**

Richard Harwood
Michigan State University
5992 Wynn Jones Road
Port Orchard, WA 98366

phone: 360-871-4292
e-mail: rharwood@msu.edu

## Presentation Information:

Presentation Date: Thursday, November 14, 2002
Presentation Time: 9:00 am

## Keywords:

soil quality, C mineralization, N mineralization, rotation