Cropping systems effect on soil quality. (S04-islam084438-Oral)

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Abstract:

Soil quality is often influenced by management practices. To evaluate longterm effects of cropping systems on soil quality and crop yield, soil cores were randomly collected from 0.4 ha replicated plots under continuous corn with chisel plow (CC), corn/soybean with alternate year tillage (CS), and corn/soybean/wheat/cover crop (CSWC) rotation. Cores were analyzed for various soil properties (total microbial biomass, basal and specific respiration rates, earthworms, extractable, mineralizable, active and total C pools, bulk density, total and waterfilled porosity, infiltration and aggregate stability) have significantly improved under CSWC and CS rotations relative to CC. Using an inductive additive approach, soil properties were normalized relative to their maximum value in the data set, summed and averaged to calculate a soil quality index (SQI). The SQI values were significantly higher in CSWC vs. CS and CC. Averaged across years the crop yield was significantly higher in CSWC and CS rotations than in CC. Experimental results suggest that longterm effects of crop rotation with cover crops have enhanced soil quality and improved crop yield over continuous corn with chisel plow.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 1:30 pm

Keywords:
Long-term effects, cover crops and rotation, crop yields, soil quality