# Soil Chemical Changes Over 16 Years as Influenced by Nitrogen Fertilization, Tillage, and Crop Sequence. (S06liebig085257-Poster)

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### Abstract:

Changes in soil chemical properties due to long-term management can influence plant nutrient availability, crop yield, and environmental quality. The objective of this study was to determine the effects of N fertilization, tillage, and crop sequence on selected soil chemical properties for a long-term cropping systems experiment in central North Dakota on a Wilton silt loam (fine-silty, mixed, superactive frigid Pachic Haplustoll). Soil samples collected prior to the application of treatments (1983) and again in 1999 were evaluated for electrical conductivity (EC), soil pH, exchangeable cations, and soil inorganic C at depths of 0-7.6, 7.6-15.2, 15.2-30.5, 30.5-45.7, and 45.7-60.9 cm. Treatment effects on EC and exchangeable sodium and potassium were negligible over time. Soil pH decreased significantly from 1983 to 1999 in the surface 7.6 cm; a result caused by acidification from N fertilization. In contrast to surface acidification, soil pH increased below 15.2 cm from 1983 to 1999. Calcium, the most abundant exchangeable cation, increased significantly over time below 7.6 cm within a spring wheat-winter wheatsunflower crop sequence. Averaged over all treatments, soil inorganic C increased 828 kg/ha from 1983 to 1999 in the 30.5-45.7 cm depth. Results from this study indicate long-term management may increase soil inorganic C at lower depths in calcium-rich soils.

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