

Public Abstract

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Title:Increased Corn Rotation Frequency Cropping System Impacts on Soil Functional Properties

Crop rotations including more corn have become common in the southern region of the U.S Corn Belt due to high grain production levels and economic benefits. This increase in corn adoption has raised concerns about the long-term sustainability of corn-intense cropping systems and their overall impact to soil properties. The objective of this study was to identify the impacts of crop rotations with varying frequencies of corn and soybean in rotation on soil properties in a long term no-till management system. Soil samples were collected in the spring of 2014, at surface (0 to 5cm) and subsurface (5 to 15cm) depths. Measurements examined represented soil physical, chemical, and biological properties. As corn increased in rotation, favorable trends in a majority of the soil measurements examined at 0 to 5cm were observed. Soil carbon, water content, organic matter, and microbial populations all displayed increasing trends with increased corn in rotation, while soil compaction and salt levels decreased. In addition, continuous corn had the highest values for soil nitrogen. Unfavorable effects with increasing corn in rotation included decreases to soil structure at 5 to 15cm and reduced soil phosphorus levels at both depths. No differences were observed with increased corn in rotation for pH, calcium, or magnesium. Increased corn in rotation appeared to have a positive influence on most soil properties at the soil surface.