

Public Abstract

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Title:Implications for Soil Health: Assessing Crop Management Systems and Cover Crops on Mid-Ohio Glaciated Soils

Cropping systems management and the presence or absence of cover crops directly influence many physical, chemical, and biological soil properties. The research hypothesis was that the use of cover crops and a no till crop management system would improve soil health compared with a conventional corn-soybean production system. The study involved an assessment of numerous soil health indicators from surface soils collected at a diversified crop farm in Fairfield County, Ohio. The objectives of this study were to compare soil physical, chemical, and biological indicators across conventional, transitional, and progressive management systems on three landscape positions. Wet aggregate stability was significantly different in the progressive management and showed a 62% increase over the conventional management. Active carbon was significantly different in the progressive management and showed a 21% increase over the conventional management. Fungi PLFA biomarkers were significantly different in the transitional management and showed a 41% increase over the conventional and 42% increase over the progressive management. AM Fungi PLFA biomarkers were significantly different in the transitional management and showed a 29% increase over conventional, and 10% increase over the progressive management. Landscape position did not have significant effects on soil health parameters across management systems. The results from assessment of soil health properties on three management systems at this Ohio farm demonstrated the contribution of sustainable agricultural practices such as no-till and cover crops for maintaining soil health and biological activity. Complex interactions in soil may need more than a few years to change and manifest themselves; therefore physical, chemical and biological test indicators are important so land managers can assess their soils.