SOIL QUALITY IN ORGANIC CROPPING SYSTEMS

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ABSTRACT

The objective of this research was to quantify soil quality indicator levels under contrasting organic practices and to provide scientific information that can lead to development of best management practices for organic no-till and transitioning to organic production. Four studies examining crop yield, soil quality and weed control were conducted in Boone County, MO on a Mexico silt loam soil (fine, smectitic, mesic Vertic Epiaqualfs) from 2012-2014. Achieving a cover crop biomass sufficient for weed suppression was a challenge when soil fertility declined under organic rotations. When there was adequate soil moisture and weed control from the cover crop, soybean grown under organic no-till was competitive with tilled treatments. Optimum timing of cover crop crimping for acceptable weed control was more successful in a soybean production system compared with corn. Cover crops tended to mitigate the negative effects of tillage on soil in this study and cover crops impacted soil quality more when grown in conjunction with soybean than with corn or wheat. Germination and emergence of corn in an organic no-till system was significantly impacted by planting times and cover crop termination method. The likely cause of reduced plant density in organic no-till was due to difficulty of planting in cover crops. Plant population was highest in corn planted into a standing cover crop, then decreased as the time between termination and corn planting increased.