

Observing Soil Changes Under Common Cropping Practices in Kentucky

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Abstract

Cropping production and tillage systems lead to loss of soil organic matter (SOM), lowering soil pH, and soil compaction in Kentucky. However, the magnitude of the changes varied among the soil properties. Therefore, the objective of this research was to evaluate the changes of SOM, soil pH, and soil compaction under different cropping systems like corn-soybean-tobacco rotation (Field #1), continuous corn field (Field #2), hemp field (Field #3), wheat field (Field #4), pasture with animal grazing (Field #5), and canola field (Field #6). The prominent soil textures in all fields are silt loam and silt clay loam. Disturbed soil samples were taken at the depth of 0-7 cm and 7-23 cm to measure SOM and soil pH. There were three replications from each field. The results indicated that the canola field which has been under no till for over fifteen years had the highest SOM at an average of 4.2% in 0-7 cm. At similar depth, continuous cornfield had the second lowest amounts of SOM which was 2.8%. The canola field and the continuous cornfield had soil pH of 6.7 and 5.37, respectively indicating the highest and the lowest level of acidity. The averages of soil compaction from all fields were 159 psi in 0-7 cm, and 427 psi in 7-23 cm. The highest compaction was found in the field under animal grazing at 561 psi the lowest was under tobacco at 243.5 psi. The findings from this study revealed that SOM, soil pH, and soil compaction changed as affected by cropping practices.

Key Words: Compaction, Husbandry, pH, Soil Organic Matter, Western Kentucky