



Continual Presence of Cover Crops Effects Soil Biological Indicators

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Cover crops are established between cash crops to improve soil function for the benefit of crop production and ecosystem services. The time period over which cover crops have a measurable effect on soil quality indicators ranges from several months to many years. To investigate the short term effect of cover crops on soil biological indicators, a field trial was established in the Fens, Cambridgeshire on a Drainic Sapric Histosol. A cereal and brassica based cover crop was established between wheat and maize (Aug 2016- Apr 2017), and was succeeded by a companion crop (grass and legume) established with maize. The companion crop remained overwinter, after maize harvest until lettuce establishment in June 2018.

The study highlighted that the cover crop established between wheat and maize did not result in any significant differences to earthworm population, microbial biomass carbon, fungal biomass or phospholipid fatty acid (PLFA) biomarkers associated with fungi and bacteria when compared to a control, which grew with wheat volunteers. However, following the companion crop, there was a large increase in the earthworm population. Earthworm population was affected by the companion crop biomass, which was negatively affected by the presence of the brassica cover crop. Thus, there was a greater earthworm population in the companion crop treatment which followed the control (wheat volunteers) than the brassica cover crop sown between wheat and maize. The companion crop treatment, which followed the wheat volunteer control significantly increased the PLFA biomarkers associated with fungi. Additionally, microbial biomass carbon was significantly increased when measured following the companion crop treatment that contained the cereal and brassica cover crop established earlier in the rotation.

The study highlights that cover crop species selection and continuity of plant growth is vital for the accumulation of soil biological indicators, but significant benefits can be measured in the short term (<20months).