

Public Abstract

First Name:Steven

Middle Name:Oakley

Last Name:Easterby

Adviser's First Name:Newell

Adviser's Last Name:Kitchen

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SP 2014

Department:Soil, Environmental & Atmospheric Sciences

Degree:MS

Title:MANAGEMENT IMPACTS ON GHG EMISSIONS AND YIELD FOR AN ORGANIC SOYBEAN CROP

As demand for organically grown food increases, growing organic soybean can be profitable and also improve soil ecosystem services through sustainable agronomic practices. The purpose of this investigation was to determine the effects of tillage, cover crop, and compost rate on yield and the soil release of two greenhouse gases (GHG), nitrous oxide (N₂O) and carbon dioxide (CO₂), under an organic soybean cropping system grown on a Missouri claypan soil. Neither tillage/cover practice nor compost was found to affect either N₂O or CO₂ emissions during 2012 or 2013. Low levels of gas flux were found. Low emissions may be linked to the drought which occurred during 2012, and below average summer precipitation in 2013.

In 2012 the cover crop limited yields, likely due to the depletion of soil moisture caused by the cover crop and exacerbated by the drought. Higher compost rates resulted in greater yields in 2013, although the two highest rates were not different from each other. Also, the fact that differences between yields occurred in 2013 and not 2012 suggests that multiple years of annual compost applications may be necessary before the benefits of the fertilizer become apparent.