In-situ CO2 evolution and soil organic C pools in switchgrass land managed for biomass production. (S03-doolittle140249-Poster)

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Abstract:

Soil is an important component in the global C budget. We investigated the effects of fertilization on in-situ CO2 evolution and soil organic C (SOC) pools in land established with switchgrass (Panicum virgatum L.) and managed for biomass production. The mean value of in-situ CO2 evolution was the highest in manure-treated plots (8.39 g CO2-C m^-2 d^-1). This rate was not significantly different from control plots (4.00) or N and P fertilized plots (3.75). Potentially mineralizable C (PMC), soil microbial biomass C (SMBC), and particulate organic C (POC) had the highest values in the surface 10 cm of the manure-treated plots. There was no difference among treatments in the subsurface. Carbon mineralization had the strongest correlation with SMBC (r = 0.905) and POC (r = 0.840). There was also a strong correlation with SMBC and POC (r = 0.900). For a single-predictor regression model, PMC was the best predictor (r^2 = 0.739) of in-situ CO2 evolution. Our results show that N and P fertilization had no impact

on temporal changes of soil organic C, but manure application had a significant impact on seasonal soil CO2 evolution and active C pools such as PMC, SMBC, and POC.

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