**200-AGR**

# Two-year Experimental warming effects on soil respiration and microbial community function in a switchgrass cropland in Middle Tennessee

Global warming is projected to accelerate soil carbon (C) loss to atmosphere creating a possibly positive C and climate feedback; however, the underlying microbial controls on soil $CO_2$ emission under warming are not adequately studied. To address this issue, a soil warming experiment was established in a switchgrass cropland at Tennessee State University in May 2021. Four paired plots with infrared and faked heaters (i.e., warming vs. control plots) were randomly installed in four blocks. Collections of hourly soil heterotrophic respiration (Rs), temperature, and moisture at surface soil (0-10 cm), as well as biweekly soil organic carbon (SOC), total nitrogen (TN), microbial biomass carbon and nitrogen (MBC and MBN), and extracellular enzyme activities (EEAs) were conducted consecutively for two years. Results showed that the experimental warming exhibited significant effects on both blocky and seasonal variations of hourly Rs and daily Rs. The warming treatment significantly increased hourly Rs and daily Rs and decreased volumetric soil moisture content, but had no significant effects on the contents of SOC, TN, MBC, MBN, and soil EEAs. In addition, the elevated Rs were closely associated with the warming-caused changes in soil microbial activity and soil temperature or moisture. Overall, the elevated Rs in response to 2-year experimental warming represented a depressed microbial activity and carbon use efficiency but long-term responses remain to be explored.