A020 LPSC

Photosynthetic Responses of Switchgrass to CO2 Concentration and Light

Abstract

Switchgrass is a promising bioenergy crop native to North America. But how climate change such as precipitation intensity change would influence switchgrass physiology, particularly the responses of leaf photosynthesis to CO_2 concentration and light, has not been well investigated. We conducted a field precipitation experiment by growing switchgrass under five different precipitation treatments (-50%, -33%, 0%, +33%, +50% of ambient precipitation) in the field at the TSU Research and Education Center, Nashville, TN. Leaf photosynthesis, stomatal conductance and transpiration were measured during the growing season of 2020. Photosynthesis and CO_2 responses and photosynthesis and light responses were measured as well. Results showed seasonal variations of leaf photosynthesis and transpiration under different precipitation treatments. Leaf photosynthesis showed typical CO_2 and light responses. The estimated maximum leaf photosynthetic rate also varied along time and among precipitation different treatments. The results of this study will be helpful for model simulation of switchgrass physiology and biomass modeling. This study was supported by the NSF projects.