Center for Agricultural and Rural Sustainability

Faculty Spotlight

March 2015

Benjamin Runkle

Assistant Professor, Department of Biological and Agriculture Engineering

Project Title: Landscape Flux of Rice Production

Project Description: Dr. Benjamin Runkle is working with collaborators in Eastern Arkansas to measure environmental fluxes in rice production. Starting this cropping season, Runkle and his team will measure methane, carbon dioxide and water movement from the landscape to the atmosphere. This work will be performed in a side by side field comparison of continuous-wet rice production and alternate wet-dry system of rice production at a family farm in eastern Arkansas. He hopes to determine if the alternative system will result in a decrease in net methane emissions without a significant yield decline. The wet-dry system uses significantly less water so they will also be measuring water use vertically through evaporation and at the field level by metering irrigation pipes. Michele Reba, USDA ARS hydrologist and Merle Anders, retired Extension Specialist for Rice, have conducted preliminary work to warrant further investigation. Runkle will collect data on a continuous basis whereas the preliminary study data were collected weekly.

An interesting attribute of the alternate wet-dry method of rice production is that it is allowed in the American Carbon Registry. Growers can sell carbon credits to companies and organizations that buy carbon credits. This may provide an incentive for growers to use this system and help off-set any potential yield loss. Growers could also use a 'carbon-friendly' eco-label to help market their goods.

Collaborators: Michele Reba, USDA-ARS hydrologist and Merle Anders, retired Extension Specialist for Rice. Runkle is looking for other collaborators especially a plant physiologist with expertise in rice photosynthesis. He is also interested in the economic and social impacts of this production system.

Project Timeline: This project is just starting and will be long-term to cover multiple growing seasons. The effects of winter management for water fowl may be added at some point.

Tools and Methods: Runkle uses eddy covariance and remote sensors to measure wind driven transport of gases from the surface to atmosphere. Wind and methane movement up and down is measured 20 times per second to generate net emissions over time.

Runkle's study field, Humnoke, AR

More info:

wordpress.uark.edu/brrunkle

http://scholar.google.com/citations?user=SeZEXyoAAAAJ&hl=en