

► Water Management In MidSouth Rice Production

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Rice is the staple crop for the largest number of people in the world. Arkansas accounts for nearly 50% of US rice production which is distributed over 1 million ha. Irrigation water use in rice production is high relative to other crops and strategies for using less water while maintaining grain yields are being developed. The majority of rice production relies on groundwater extraction. Declining groundwater levels threatens the long-term use of this source. A detailed study looking at water use on two production-sized fields is presented from data collected during production season 2013 and 2014. Both fields were planted with a hybrid rice variety known for its shorter growing season and increased drought stress tolerance. These fields were instrumented with eddy covariance sensors to measure carbon, heat, and water fluxes in 2013. Additional methane analyzers were added in 2014. Components of the energy and water balance were measured with additional sensors. Plant growth staging was inventoried to understand growth and track production. One field was managed under alternate wetting and drying (AWD) or intermittent flooding and the other was conventionally flooded. AWD allows the applied irrigation water to subside until the field gets to a “wet mud” state at which time the field is re-flooded. Conventional flooding maintains a constant flood on the crop from the V4-V5 growth stage (4-5 leaf stage) until the R7 growth stage. Differences in water applied were minimal in 2013. This we attribute, in part, to the cool and wet conditions throughout the growing season. However, insight was gained on water use of the crop during the production season for the hybrid variety studied and linked to plant growth. This information is sparse in the Mid-South region of the United States. The addition of methane data in 2014 will provide further insight on greenhouse gas mitigation as a result of water management. Opportunities for carbon market credits as a result of AWD will also be discussed. Production experience with AWD will be described and discussed by Mr. Mike Sullivan.