



GUIDELINES AND TOOLS FOR INCREASED IRRIGATION EFFICIENCY

Dr. Jason Krutz at MSU–DREC has completed studies that were funded with MSPB checkoff dollars. The results of those studies are [here](#) (RISER Project) and [here](#) (Surge Valves). Basic findings from that research follow.

- Implementation of Irrigation Water Management (IWM) tools that included computerized hole selection ([PHAUCET](#)), surge irrigation, and soil moisture sensor-based irrigation scheduling resulted in the same yield as that from a control system that used conventional (CONV) furrow irrigation methods. IWM reduced water use by 26% and increased Irrigation Water Use Efficiency (IWUE) 36%. Net returns above irrigation costs were not different between CONV and IWM over a range of pumping depths and fuel costs. Thus, implementation of IWM tools will reduce the demand on groundwater supplies without adversely affecting soybean seed yield or on-farm profitability.
- Using Surge irrigation (SURGE) vs. conventional continuous furrow irrigation (CONV) reduced the amount of water applied per irrigation event by 22%, reduced the total amount of seasonal irrigation water applied by 24%, and increased IWUE by 29%. Net returns above irrigation costs did not differ between SURGE and CONV regardless of pumping depth or fuel cost. Thus, Midsouth soybean producers can adopt SURGE on clay-textured soils without affecting seed yield and profits, while concurrently decreasing the amount of irrigation water applied.

These results are incorporated into [a set of articles](#) that Dr. Krutz posted on the Mississippi Crop

Situation website.

The first article is “Corn and Soybean Irrigation Guidelines”, where guidelines for irrigating corn and soybeans based on crop growth stage and soil moisture sensor readings in the active rooting zone are presented. The following two articles, titled “Utilizing Moisture Sensors to Increase Irrigation Efficiency” and “Watermark Sensors, Calculating Soil Moisture for Irrigation Initiation”, discuss the proper setup and use of sensors and the interpretation of subsequent readings to time irrigation based on the active rooting zone. The fourth article is titled “Surge Valves Increase Application Efficiency” and presents information to guide growers in using [Surge Valves](#) as an additional tool to increase irrigation efficiency.

Dr. Chris Henry of the Univ. of Ark. and Dr. Jason Krutz published a more detailed article about surge irrigation use titled “[Surge Irrigation Information](#)” in May 2017.

Use of these tools should be incorporated with the furrow irrigation setup that employs PHAUCET/[Pipe Planner](#). Together, these three tools will result in decreased irrigation costs, increased irrigation water use efficiency, and reduced amount of water pumped from the Alluvial Aquifer.

Additional information and details about the use of soil moisture sensors for irrigation scheduling has been compiled by YMD and can be viewed as the final two articles [here](#).

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