



Mississippi Corn Promotion Board 2023 Progress Report

Project

Title: Row-crop Irrigation Science Extension and Research (RISER) Program

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Project Summary (Issue/Response)



Our research program has identified several technologies and irrigation water management (IWM) practices that can reduce the overdraft on the Mississippi Alluvial Aquifer while maintaining or increasing yield, increasing net returns, and ensuring that corn, cotton, soybean, and rice producers do not exceed permitted irrigation limits. However, the adoption of proven irrigation water management practices by Mississippi producers has been minimal. This project will have a two-pronged approach:

1) Identify, evaluate, and demonstrate new irrigation automation technologies in furrow irrigation; 2) Conduct hands-on training and learning opportunities with producers that have yet to adopt proven irrigation water management practices.

This project will evaluate whether or not the addition of automation to furrow irrigation practices would promote better management of those practices and, thereby, enable farmers to increase yields using less labor, water, and energy. Additionally, to encourage adoption, growers will receive assistance with design, installation of proven IWM practices on their farm, and irrigation timing decisions. This hands-on learning approach alongside the producer will provide maximum learning opportunities and remove possible barriers to technology adoption. This program will address the full spectrum of growers in Mississippi – from those who need to initiate IWM practices to those who have already adopted some or all of the proven technologies. We submit that the RISER (Row-crop Irrigation Science Extension and Research) Program can serve as the means to facilitate the widespread adoption of the latest irrigation water management practices across the Mississippi Delta as well as investigate new opportunities.



Project Results/Outcomes

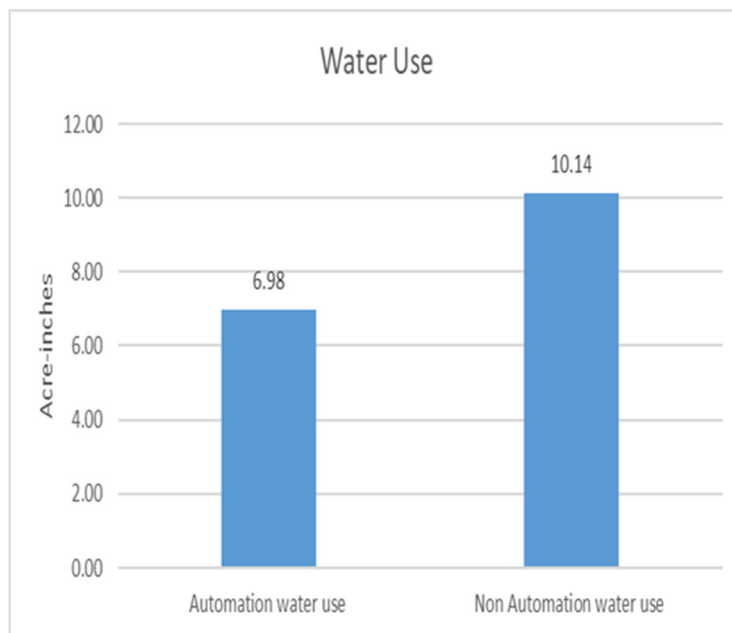
Objective 1: Two collaborators agreed to participate in the 2023 RISER program to evaluate irrigation automation. Sites were in Coahoma and Washington counties. Each site had soil moisture sensors, pump controls and automation, and automated actuator valves for each well and its associated fields. The evaluation included the actuated valves' functionality and monitored and recorded failures of the actuated valves throughout the season. After the 2021 season, researchers met with Valley Inc. to discuss feedback and increase the usability of the product. After our meeting, they decided to upgrade the user interface. The new software for 2022 required new hardware boxes. After the new hardware was installed for the 2023 season, the control systems were better equipped for the valves, but technical and connectivity issues continued. Overall, automation has been shown to reduce water use when working correctly, but the technology is not yet ready for full-scale and farm use. The set will not work correctly if one part of the system is disconnected. It is recommended that individual tools (not needed to all be connected) can be used in an applicable way on-farm moving further. Objective 2: The RISER program trains and assists county Extension agents, who in turn, reach growers who have been hesitant to adopt soil moisture sensors. In 2023, 27 farms participated in the hands-on, season long soil moisture sensor demonstration education program. Working with county agents, RISER personnel installed sensors, set up telemetry with grower access, and worked through in-season irrigation triggers with the growers to build confidence in sensors. Numerous phone

Project Results

calls, texts, and site visits were conducted to assist in irrigation management. Listed below are some of the other training and educational opportunities, made possible through RISER, for growers in 2023. Goals are to: 1) Develop an increased understanding of soil moisture sensors 2) Gain confidence in making irrigation decisions, and 3) Increase the adoption of soil moisture sensors and build confidence in sensors. Participating growers received a weekly report showing their soil moisture sensor weighted averages and recommendations based on sensor readings and site visits. Each grower was assisted individually to tailor the message based on "where they are" in using soil moisture sensors. Recommendations, one-on-one explanations of centibar readings, and troubleshooting techniques were made throughout the season to build confidence in soil moisture sensors and build the producer's competency in utilizing soil moisture sensors.

Soil Moisture Sensors On-farm Demo:

Individual meetings were conducted with 12 of the 27 participants in the soil moisture sensors on-farm demonstration program. The remaining meetings will be held during the fourth quarter. The meetings covered a year-end review that included season-long soil moisture graphs, rainfall, and



Project Impacts/Benefits

The RISER program is evaluating new technology that is focused on enhancing furrow irrigation and allowing for new automation. Automation can be used to save time, labor, and water and to increase water use efficiency. The RISER program demonstrates the potential for irrigation water management tools to improve on-farm profitability up to \$30/acre while reducing water use by 41%. Additionally, the RISER program serves as a catalyst for the adoption of IWM that will make Mississippi corn producers more profitable while reducing demand on the Mississippi Alluvial Aquifer. In 2023, the RISER program installed moisture sensors and trained producers one-on-one to promote the adoption of these practices that cover over 32,000 acres resulting in over \$600,000 in increased profitability and saving of 12,000 acre-feet or 3.9 billion gallons of water.

Project Deliverables

In-Service Training:

ANR Extension Agent Irrigation Termination Training. Stoneville, MS 08-11-23.

ANR Extension Agent Pipe Planner Training. Stoneville, MS 03-22-23

ANR Extension Agent On-Farm Sensor Demonstration Program Training. Stoneville, MS 03-22-23

MSU Extension New Agent Orientation Training. Starkville, MS 02-28-23 presentations:

