A Mobile Irrigator Pro-Based Irrigation Scheduling Tool for Increasing Irrigation Water Use Efficiency and Yield in Peanut

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Objective: Demonstrate and promote adoption of Irrigator Pro-based irrigation scheduling tools

Work Completed in FY2020:

Over the last four years UGA, NPRL, and the FRSWCD have pooled resources and worked together to develop a smartphone application for the new generation Irrigator Pro which we will hereafter refer to as the **App**. The new generation Irrigator Pro uses soil moisture and soil temperature to make irrigation scheduling decisions. Up until 2018, the App required the user to physically visit the field to download the data from soil moisture sensors. Last year we improved the App so that soil moisture and temperature data automatically populate the model. The App now has the ability to import data directly from two automated soil moisture sensing systems – the Trellis system and the UGA SSA system. The user selects one of the two systems, enters the soil moisture sensor ID, and thereafter, soil moisture and temperature data flow directly to the Irrigator Pro cloud server where the model runs. Decisions are then sent to the user's smartphone where they are displayed as notifications. In addition to integrating the soil moisture sensor systems, we also integrated automated rain gages so precipitation is now also automatically recorded although it is not used by the model. These developments **eliminate the need to visit the field** several times a week to collect data.

For the 2019 growing season, we participated in the UGA Extension AgWET project to promote adoption and use of the Irrigator Pro App. We paired 10 county agents with two growers (20 growers, 40 fields). In addition, four crop consulting groups used the App on two of their client fields (4 growers, 8 fields). A total of 24 growers with 48 fields participated in the project. All the participants were in southwestern Georgia distributed across the 11 counties shown in Figure 1. All fields were equipped with a Trellis soil moisture sensing probe and rain gage. Overall, county agents, consultants, and growers were pleased with the App. However there were several soil moisture sensor failures during the growing season which created frustration to the users.

We also valuated the performance of the App on plots at UGA's Stripling Irrigation Research Park (SIRP) by comparing it to seven other irrigation scheduling methods. The App was compared to seven irrigation scheduling treatments as well as to a rainfed treatment. The App performed well but yield was lower than other irrigation scheduling treatments in 2019 (Table 1).

The project **was greatly leveraged** with approximately $200,000 in funding that the FRSWCD has received from the National Fish & Wildlife Foundation in partnership with the Southeast Aquatic Resources Partnership to expand the footprint of the AgWET project. The FRSWCD has agreed to focus the expansion on peanut using the App and bore the **majority** of the project's cost. FRSWCD funds were used to purchase all of the Trellis soil moisture probes and rain gages installed in the 48 fields (approximately $72,000) as well as cover the cost of 24/7 technical support for the App. Georgia Peanut Commission funds were used to **partially support a UGA Research Scientist** who supported the project's implementation and management.
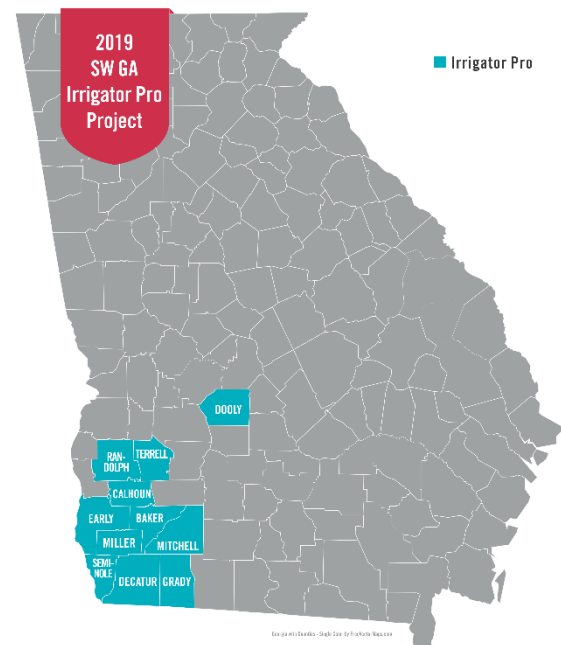

Figure 1. Map showing the eleven counties in which the project was conducted during 2019.