



Water When It Counts: Helping Farmers in the Suwannee River Basin Save Water through the Use of Soil Moisture Sensors

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Driven by the 2016 adoption of the Basin Management Action Plan for the Suwannee River Basin, strong emphasis is being placed on irrigation and nutrient management in the area. Farmers are now required by the Florida Department of Consumer Services to implement best management practices (BMP) with a specific goal of reducing nitrate leaching (Hallas and Magley, 2016; Suwannee River Water Management District. 2015.). Through a State-funded BMP mini-grant, extension agents at the Suwannee Valley Agricultural Extension Center began work with corn farmers to understand soil water holding capacity and better schedule irrigation events through soil moisture sensor (SMS).

Problem faced by the target audience

The coarse, sandy ultisol and entisol soils of North Florida have low water holding capacity averaging around 0.7 inches per foot of soil. Row crop and vegetable farmers often have history and weather forecasts as their only guides to irrigation scheduling. Crops grown during the hottest summer months are especially sensitive to daily fluctuations of moisture and temperature. Stress during critical stages of fruit or seed set can result in large yield losses. With underground soil moisture sensors, monitoring of volumetric water content and electrical conductivity (EC) status in the soil profile, and detailed record keeping are now possible.

Objectives and educational approach

1. Provide in-depth, hands-on SMS training to producers and extension agents
2. Install four sensors on farms and follow water status throughout the corn season
3. Advise irrigation plans to keep plant-available water at optimal levels.
4. Document water use and precision of four producers.
5. Conduct a workshop to raise SMS awareness in the Suwannee River Basin.

Outcomes and impacts

Attendees at the workshop indicated a strong desire to improve their timing and placement of water. One recurring quote was: "We can not manage what is not monitored." The four participating farmers applied 8% less water as compared to last year. This represents a reduction of 1.2 inches or 4.5 million gallons of water saved (27,154 gallons per acre).

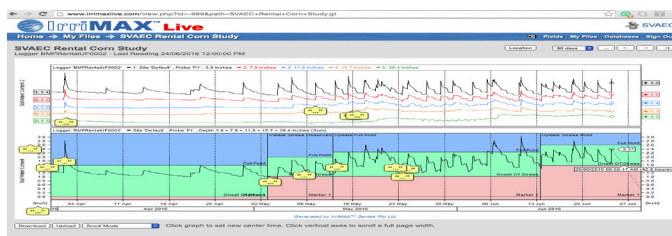


Fig. 1. An online Irrimaxlive.com SMS Sentek probe report with 5 depths on the upper graph and a single line summary on the lower indicating soil moisture levels across the season for corn grown in Live Oak, FL (blue = field capacity, green = plant available water, and pink = permanent wilting point). Farm Credit Logo Black Green

Pros and cons in adopting this program in another county

Most farmers own smart phones, but the challenge comes in using the SMS data (Fig. 1). Our local service provider gave us continuous advice and guidance. The low cost (\$2,200 per unit/year) combined with cost-share incentives (from 75% to 90%) makes the SMS a viable tool for most farmers. As such, return on investment can be as short as one year (for a 40-acre pivot). University of Florida, Institute of Food and Agricultural Sciences agents should consult their nearest industry representatives to compare their level of service and SMS models. Hand-on experimentation certainly helps break down the barriers to understanding and can give that all-important test drive to see how it can benefit their personal situation. Generating data from a wider audience on the efficacy of SMS technology will advance agricultural profitability while at the same time protecting our natural resources.

Literature Cited

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