Posters Section


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The soils of North Florida are excessively drained, deep sands, with low organic matter content and low water holding capacity. Consequently, vegetable production in the region requires intense irrigation and fertilizer management. In many areas of the region, the Suwannee River Water Management District has identified Water Use Caution Areas where water availability is inadequate to meet projected future demands. The Florida Department of Environmental Protection continues to adopt Basin Management Action Plans to address nitrate discharge in local rivers and springs. Because of the large quantity of water use and the potential of nitrates to leach into the groundwater, farmers are facing increasing pressure to document their farm management activities, specifically irrigation and fertilizer management, in accordance with Best Management Practice (BMP) programs. Vegetable growers in the area widely adopted drip irrigation and plastic mulch over the past three decades. The system is ideally suited to the crops being grown, available water supply, and the soil types. Farmers have recently begun to implement intensive site monitoring through the use of advanced technologies and instrumentation. The University of Florida Institute of Food and Agricultural Sciences Extension has worked to assist area farmers to adopt these technologies. Successful programs have emphasized the adoption of both soil moisture and plant sap sensors. Soil moisture sensor technology begins at the simplest level with a portable sensor with which the farmer takes a few samples throughout the field and verbally reports results. The enhanced versions of the technology include a fixed base-station and sensor which transmits data wirelessly to be accessed by the farmer through computers or smartphone technology. These units offer real-time data retrieval while clearly showing trends and “events.” Plant sap sensors are used to estimate petiole sap levels for interpreting and modifying the plant nutrient levels and subsequent fertilizer application rates and timing. The combination of these technologies strengthens management decisions through increased knowledge of field conditions. The objectives of this work were to educate farmers on available equipment which may be adapted to their system, to assist farmers to learn to apply the practices or equipment on their farms, and to assist in the long-term adoption of the technologies. This work was largely accomplished through cooperation between the Agents and farmers at their farms. Farmers often utilized cost-share programs from the Florida Department of Agriculture and Consumer Services to purchase the items they determined applicable to their farm. Farmers who adopted a suite of BMP technologies reported an average savings of $65 per acre in fertilizer and fuel costs. Farmers also report better crop yields and quality through improved fertilizer use and reduced plant stress. Additionally, the act of recording soil moisture and plant nutrient levels serves as documentation of BMP implementation. On-farm education and implementation of practices resulted in improved management, measurable impacts, and behavior change.

The challenges associated with Extension programming utilizing advanced technologies included: the Agent is required to learn new technology, the farmers consistently look to the Agents for assistance as opposed to an outside service provider, and farmers who adopt often require increased assistance at the beginning of the season to familiarize them with the technology again.

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