GSWCC Mobile Irrigation Lab

The Georgia Soil and Water Conservation Commission, in partnership with USDA-NRCS, offers a free irrigation system evaluation service to Georgia's agricultural community. Efficient irrigation benefits both agricultural producers and the public by maximizing crop yields while improving water conservation.

For more information on how to schedule a visit from MIL, go to http://gaswcc.georgia.gov/mobile-irrigation-lab

More information

The University of Georgia College of Agricultural and Environmental Sciences offers a number of publications related to irrigation topics online at http://www.caes.uga.edu/Publications/

The Vellidis Research Group has several ongoing projects designed to provide farmers with tools to better utilize their water resources. You can see updates at http://vellidis.org/research-projects/smart-irrigation/

The USDA Agricultural Research Service continues its efforts to provide farmers and ranchers with the latest in agricultural research that will improve the efficiency and profitability of their land. Their work is available at http://www.ars.usda.gov

Irrigator Pro

Irrigator Pro is an irrigation management expert system designed to provide irrigation scheduling recommendations based on scientific data. Originally developed for peanuts, a collaborative effort between the USDA ARS National Peanut Research Laboratory, Georgia Cotton Commission, the University of Georgia, and the Peanut Foundation was established to create comparable models for cotton and corn. More at http://gaswcc.georgia.gov/irrigator-pro-irrigation-management

Soil and Water Conservation Districts

Soil and Water Conservation Districts (SWCDs) work to protect, conserve and improve the soil and water resources for the citizens of Georgia. A list of local districts is available at http://gaswcc.georgia.gov/soil-water-conservation-districts.

How Do I Get Involved?

Georgia has 40 soil and water conservation districts led by 370 district supervisors. Supervisors are either appointed to a two-year term or elected for terms of four years. The next election of supervisors will occur in 2014. If you are interested in becoming a supervisor in your district, information on the process is available by calling the Georgia Soil and Water Conservation Commission at 706-552-4470 or going to http://gaswcc.georgia.gov/how-do-i-become-swcd-supervisor.

Georgia Soil and Water Conservation Commission
http://gaswcc.georgia.gov

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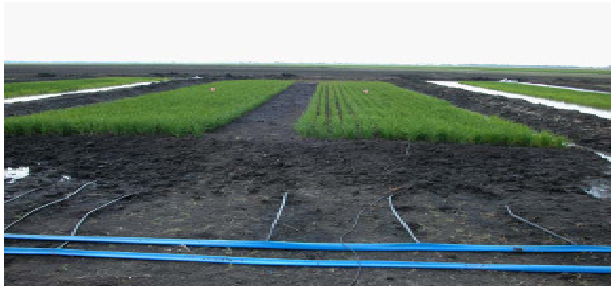
GSWCC Offices
Region I - Calhoun
Region II - Athens
Region III - Statesboro
Region IV - Milledgeville
Region V - Dawson

Irrigation Scheduling

Using technology to improve yields and conserve resources



Georgia Soil and Water Conservation Commission

GSWCC

http://gaswcc.georgia.gov/agricultural-conservation-programs

Using technology to increase yields

In an ideal world, rain would be all you need for your plants, but rainfall amounts and timing can be unpredictable. When rainfall is insufficient, irrigation needs to be considered.

Irrigation scheduling is planning when and how much water to apply to maximize plant yield during the growing season. The frequency and timing of water application has a major impact on both a farmer's yield and operating costs, as irrigation requires an investment in equipment, fuel, maintenance and labor; not to mention water resources.

Applying too little water can result in plant stress and decreased yields.

Applying too much water can waste local water resources, cause leaching of nutrients and pesticides into groundwater, and unnecessarily increase the cost of energy needed to run the irrigation system.

Different scheduling tools are available to assist in irrigation scheduling. In Georgia, the best known approaches are:

Water Balance Method
Checkbook Computer Model
Computer Expert Systems, such as Irrigator Pro
Sensors for Soil Moisture Sensors

Water Balance Method

The object of this method is to obtain a balance of incoming and outgoing soil water. You can use either crop curves or pan evaporation data to determine the amount of water leaving the soil. In either case, when the water available approaches a zero balance, it is time to irrigate.

Checkbook Computer Model

This method requires monitoring of a field's daily soil water balance. A water balance worksheet is set up that adds each day's estimated crop water use to the previous day's soil water deficit, and subtracts any water added to the field (either by rainfall or irrigation). The worksheet is operated on the same principle as a checkbook ledger with additions and subtractions, thus the name for the methodology. The system depends on the accuracy and regularity of observations and measurements. Each field would have its own worksheet due to differences in soil content, crop, planting date, and rainfall.

Computer Expert Systems, such as Irrigator Pro

Irrigator Pro is an irrigation management expert system designed to provide irrigation scheduling recommendations based on scientific data.

Soil Moisture Sensors

Sensors in the soil may be used in conjunction with a computer model, or they may be used independently. The most common types of sensors are soil tension meters, moisture blocks, and various electronic soil probes.

When considering investing in sensors, you should include not only the expense of the instruments, but also installation and servicing costs.

Research

UGA SSA is a low-cost wireless soil moisture sensing system that uses a dense network of nodes to accurately characterize soil moisture variability.

FIST project is a partnership between the Flint River SWCD, UGA, USDA-NRCS, USDA-ARS, IBM, and several participating farmers that uses UGA SSA with a web-based user interface in the Lower Flint River Basin in Georgia.

Smartphone technology is being developed that will provide farmers with irrigation scheduling apps for accessing real-time and forecasting information to allow for faster and more accurate decision making.

Table 1. Comparison of Methods

	Balance Method	Tension Meters	Resistance Blocks	Computer Models
Expense	No expense	Moderate expense	Moderate expense	Expensive *
Accuracy	Fair	Good	Good	Fair (depending on inputs)**
Operate Automated Equipment	No	Yes	Yes	Yes
Repeatability	Fair	Good	Fair	Good

* Varies depending on if computer already exists in farming operation. **Computer models are only as accurate as the data used for inputs (i.e., weather, rainfall, etc.)

Source: "Irrigation Scheduling Methods" Bulletin No. 974, University of Georgia College of Agricultural & Environmental Sciences