Adding an Option for Later-Maturing Peanut Cultivars to SmartIrrigation CropFit

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Project Summary:

The SmartIrrigation CropFit App (SI CropFit) (https://smartirrigationapps.org/cropfit-app/) is a recently released irrigation scheduling tool that operates on a smartphone platform. It includes irrigation scheduling models for corn, cotton, peanut, and soybean. Based on evaluations conducted at Auburn, Mississippi State, the University of Florida, UGA, and the National Peanut Research Lab (NPRL), scheduling irrigation with the SI CropFit results in water savings of up to 40% and yield increases of up to 15% when compared to the traditional Extension Checkbook method and performs at least as well as scheduling irrigation with soil moisture sensors. The current SI CropFit peanut model was developed primarily using medium-maturing cultivars like Georgia-06G and AUNPL-17. Because of this, during some growing seasons, irrigation scheduling recommendations may cease while late-maturing cultivars like Georgia-12Y still require irrigation. The goal of this project was to evaluate the performance of SI CropFit when scheduling irrigation with late maturing peanut cultivars and make modifications needed to the model.

A replicated plot study to collect data for this assessment was conducted during the 2025 growing seasons at the UGA's C.M. Stripling Irrigation Research Park (SIRP), in Mitchell County, Georgia. The study was conducted on a 3-ac block of a research field known as the Newton Lateral Field. The block contained plots measuring 48 ft long × 48 ft (8 beds) wide. The middle 4 beds in each plot were used for data collection, and the 2 beds on either side acted as buffers. The block was divided into approximately equal halves. One half was planted to Georgia 06G (medium-maturing) while the other half was planted to Georgia 12Y (late-maturing) on 08 May 2025. Eighteen plots were used for the study with nine plots assigned to each cultivar. The study plan followed a randomized complete block design with two irrigation scheduling treatments and a rainfed treatment and three replicates for each treatment. The irrigation treatments were scheduling with the UGA Smart Sensor Array (UGA SSA) and scheduling with SI CropFit. Growing season precipitation was 16.8 in and evenly distributed throughout the growing season.

The 06G cultivar was inverted on 22 September and harvested on 01 October while the 12Y cultivar was inverted on 29 September and harvested on 04 October. Table 1 shows the results from the study. The main finding is that the growing conditions during 2025 resulted in both cultivars maturing within a few days of each other. The last irrigation event for both cultivars occurred on 19 September so there were not significant differences in growing season length to observe. The study will need to be repeated to collect data on modifying the SI CropFit peanut model to differentiate between medium-maturing and late-maturing cultivars. However, the study did provide excellent results on the effectiveness of using SI CropFit for irrigation scheduling in peanut. For both cultivars, yields resulting from irrigation with SI CropFit matched those of scheduling with the soil moisture sensor-based UGA SSA (Table 1). More importantly, scheduling irrigation with SI CropFit resulted in three fewer 0.75-in irrigation events for the 06G cultivar and two fewer events for the 12Y cultivar. Furthermore, this difference in irrigation applied resulted in higher irrigation water use efficiency (IWUE) for SI CropFit as shown in Table 1.

2025 was the first growing season that the SI CropFit peanut model was available for use by Georgia growers. SI CropFit metrics indicate that there were 40 unique users in Georgia who registered 156 fields covering 6,746 ac of irrigated peanut (Figure 1). This rapid adoption is primarily the result of the UGA Extension Ag Water Team's outreach efforts.

Table 1. Results from the irrigation scheduling study conducted at SIRP during the 2025 growing season. Yields between the irrigated treatments and the rainfed treatment were statistically different at $\alpha = 0.05$ for both cultivars.

Treatment	Cultivar	Mean Yield (lb/ac)	Irrigation Events [1] (0.75 in)	Irrigation (in)	IWUE [1] (lb/ac-in)
SI CropFit	06G	6358 [b]	13	10.5	90
UGA SSA	06G	6324 [b]	16	12.3	74
Rainfed	06G	5439 [a]		0.3	
SI CropFit	12Y	6758 [b]	11	8.55	188
UGA SSA	12Y	6762 [b]	13	10.5	152
Rainfed	12Y	5208 [b]		0.3	

[1] Only treatment-specific events shown
[2] IWUE = Irrigation water use efficiency and indicates the difference in yield attributed to irrigation.

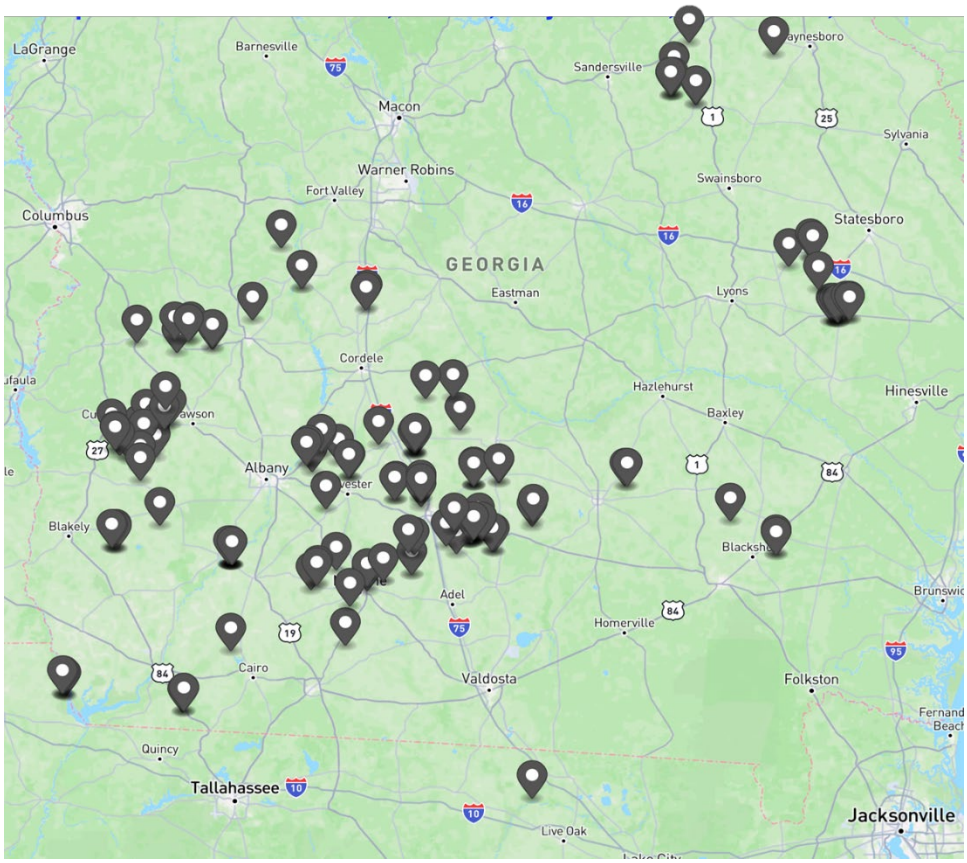

Figure 1. Map showing location of peanut fields registered in SI CropFit during the 2025 growing season.