

Sensor-linked Management Techniques for Enhancing Water Use Efficiency, Yield and Quality of Peanuts– a Multidisciplinary Approach (PID # 569, SID # GA-205, BID # 1765)

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Three varieties of peanut were planted in 12 experimental plots in Fort Valley State University's new farm (Fig. 1). Soil health and fertility score were determined for the experimental plots. Total precipitation received was recorded. Pesticides were regularly applied to control weeds. A portable battery-operated prototype sensing system was designed and developed at Purdue University, which can measure and display temperature and relative humidity of air, moisture content, and temperature of soil. Emphasis was given to make the system modular, portable, cost effective, and easy to use.

Preharvest and postharvest growth parameters

Plant height, width, and flower number were measured. Plant growth was stunted due to unseasonal rains and deer grazing. Temperature and relative humidity of air, moisture content and temperature of soil were measured using the sensor (Fig. 2). Plant biomass, pod number, pod weight, and seed weight were measured.

We conducted additional investigation to develop a second version of the sensor with added functionalities. Calibration models were developed for determining soil moisture content to validate the incorporated sensor involving field experiments at FVSU and lab work at FVSU and Purdue. Work has also been going on to design and integrate wi-fi capabilities for sending information from the sensor to a cell phone. Current work focusing on determining soil moisture in a non-contact manner will be of huge benefit to the peanut growers. The global COVID-19 pandemic had significant impact on the execution of the project and our productivity goals. We would like to have an extension on your projects.



Fig. 1. Experimental plots in FVSU's new farm.



Fig. 2. Portable battery-operated sensing system (First version).