Florida Stakeholder Engagement Program (STEP) – 2024 Cotton Contest

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Panhandle Row Crop Short Course

Marianna, FL

UF | IFAS
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Motivation

- In Florida, different state and federal agencies have promoted and incentivized the use of **Best Management Practices (BMPs) and technologies** for water and nutrient management.
- **Cost Share programs**

- **Major Questions:**
  - How do we increase the adoption of Best Management Practices (BMPs)and Ag technology in Florida?
  - Are we addressing the questions asked by producers?
  - Are we the “best educators/specialists/teachers” for the information?
  - How do we connect and get producers excited about new opportunities?

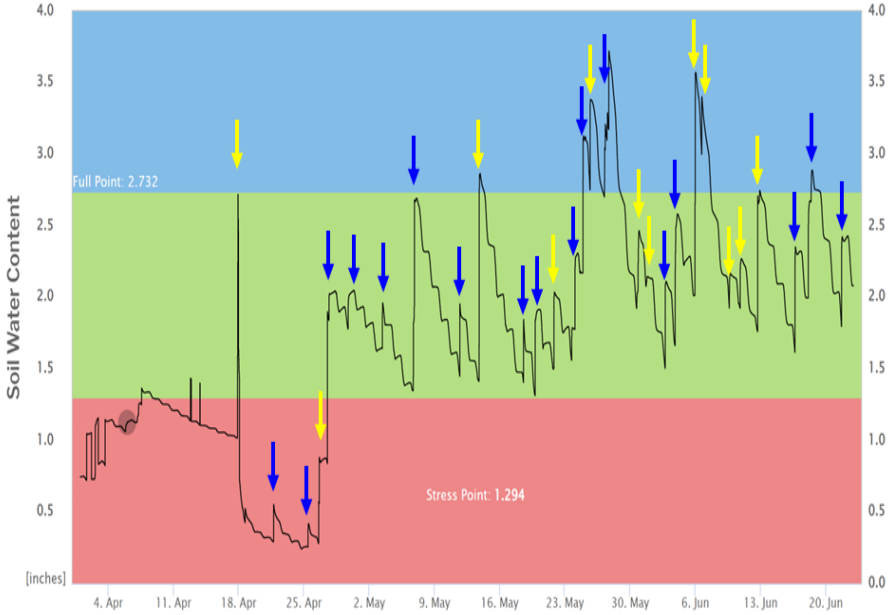
What is Florida STEP?

- The **Florida Innovative Stakeholder Engagement Program (Florida STEP)** is an innovative extension programming to engage growers, Ag industry, agricultural research, and extension in an interactive real-world system to increase productivity, sustainability, and profitability:

Competition

Peer-to-peer interaction

Action-oriented learning
Experimental



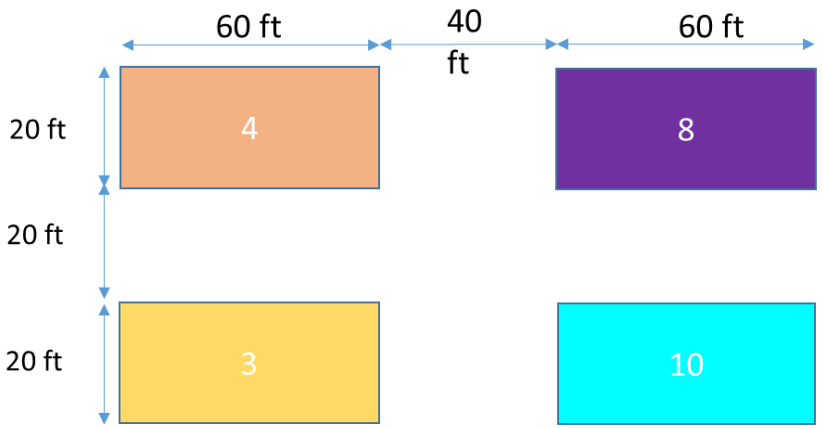
Objectives

- **The main objective is to host farm management competitions that promote profitability and efficiency:**

  - To facilitate grower discovery and adoption of new and emerging knowledge.
  - Create a safe environment for action-oriented learning (testing, observation, experimentation, and implementation) of new and emerging technologies and BMPs.
  - Create an atmosphere of excitement, competition, and learning.
  - Fosters peer-to-peer interaction and creates a forum of collaboration among all members of the agricultural community.
  - Maintain discovery and information integrity and disseminate effective educational, outreach, and training material that will lead to acceptance of recommended BMPs and make the program an engine to change and innovation.

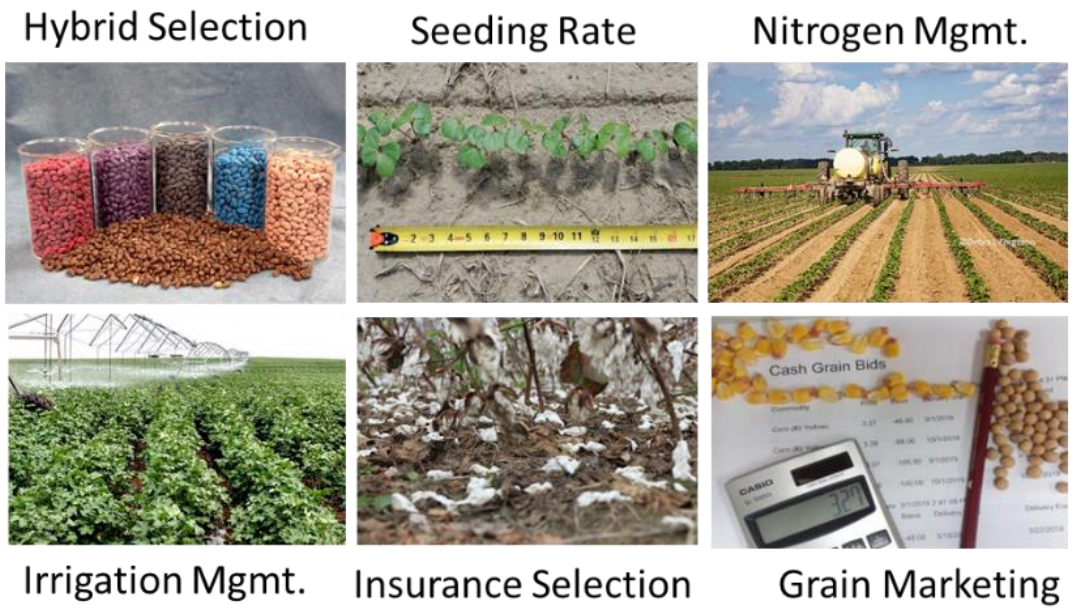
Florida STEP Cotton Contest 2024

- West Florida Research and Educational Center (WFREC), Jay FL
- Variable Rate Irrigation System
- Four randomized plots
- Each farm on paper includes 1000 harvest acres for the purposes of making decisions but is imposed on plots at WFREC.



Management Decisions

- **Management Decisions for Cotton Contest**
  - Cotton hybrid,
  - Seeding rate,
  - Irrigation management,
  - Nitrogen management,
  - Growth Regulator
  - Insurance selection, and
  - Cotton marketing.



- The project team at the station will manage all plots.
- These decisions will be made in real-time using a secure STEP website (https://step.ifas.ufl.edu/) provided to participating teams at the start of the competition.
- Other Management decision remain same for all teams.

Management Decision – Hybrid Selection and Seeding Rate

- Each team will be required to select their seed hybrid and seeding rate.
- Teams are allowed to work with multiple local seed companies for hybrid selection.
- Teams are allowed to choose any plant population between 24K to 40K, in the increment of 2K.

- The project team will work with local seed companies to procure seeds for commonly available hybrids.
- In case participating team selects their hybrid, they will be responsible to supply the seed one week before the planting.

Management Decisions – Nitrogen Management

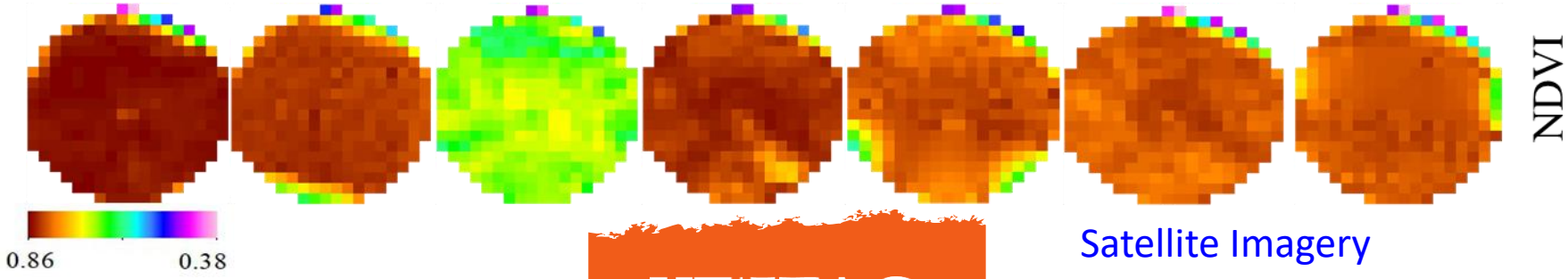
- **Nitrogen Management:**
  - Conventional fertilizer program: In-season fertilizer applications of granular urea (46-0-0) or Urea Ammonium Nitrate
    - There will be no limit on the nitrogen rate and application timing.
    - (i) Broadcasting, (ii) Banding, and (iii) Fertigation.
  - Controlled Release Fertilizer Program: Any CRF blend at any rate. All the CRF applications will be applied at planting.
- **Growth Regulator:**
  - Pix (Mepiquat Chloride) and Stance will be provided – Any rate

Ag. Technologies and data availability

Soil Sampling

Plant Tissue/Biomass Sampling

Plant Scouting

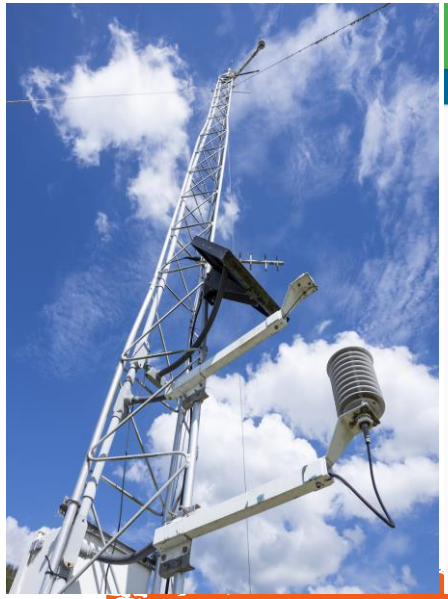


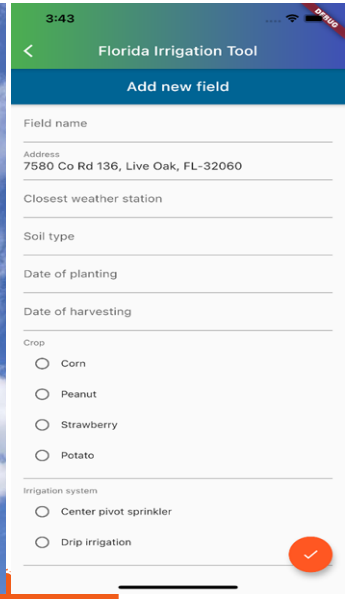
Satellite Imagery

Management Decision – Irrigation Management

- Irrigation Management: For irrigation management participating teams will have three options;
  - Soil moisture-based irrigation scheduling
  - Irrigation app (ET based irrigation scheduling)
  - Pre-determined calendar schedule
  - No Irrigation

Soil Moisture Sensing





ET Based Irrigation Scheduling

Calendar based Irrigation Scheduling

Management Decision – Irrigation Management

- The participating team will be responsible to communicate their irrigation decision one day before the application.

- From Planting to harvest, a maximum irrigation depth per application could be as much as 0.5-inch, in the interval of 0.05 inches.

- If the participating team failed to indicate their intent to irrigate no irrigation was applied.

Management Decisions – Insurance Selection

- **Insurance options:**
  - Yield protection
  - Revenue protection
- **Levels:** Catastrophic (minimum) 50% up to 85% coverage level; unit options
- **Yield Protection** insures against low yields relative to a producer's historic yields.
- **Revenue Protection** insures against low yields and low harvest price relative to projected price.
- We provide insurance quotes in advance.

Management Decisions – Cotton Marketing

- Each team will make marketing selections, assuming 1,000 acres of cotton and the team's average plot yield (hypothetical sales to local gin).
- Marketing options:
  - Forward contract between the program start date and September 30.
  - Spot sale after harvest, ginning, and classing (2 weeks after harvest).

- **The project management team will post price information weekly on the STEP website.**

Management Decisions – Cotton Marketing

- Forward contracts for cotton lint are in **increments of 100 bales (50,000 lbs)**.
- On any given date, a team can select the quantity of bales to contract.
- The contract price on those bales will be the **ICE December Futures closing price** on the contract date plus the basis posted for that week for the STEP competition.
- Teams may contract multiple times on different dates.

Management Decisions – Cotton Marketing

- Over and Under Contracted:
  - Any uncontracted bales from a team's simulated 1,000-acre harvest will be sold at the spot price two weeks after harvest.
  - If a team contracts more bales than their simulated 1,000-acre harvest, they will be charged a $0.05/lb fee, plus the difference between the spot price and highest contract price (if the spot price is higher), on the number of pounds over contracted.

Competition Results/ Awards

- The teams will compete for two awards:
  - Most profitable
  - Highest input use (high-efficiency award)

- Winners will be awarded $2000, $1000, and $500 for in each category.

Competition Results/ Awards

Most Profitable Award

- Each farmer's profit will be calculated using:
  - Yields from their research plots
  - Average price depends on their marketing choices
  - Seed, fertilization, and irrigation costs (depends on their input choices)
  - Crop insurance cost and indemnity payment (depends on insurance choice and yield/price outcomes)

- Input and insurance prices will be provided at the beginning of the competition.

Competition Results/ Awards

Highest input-use efficiency:

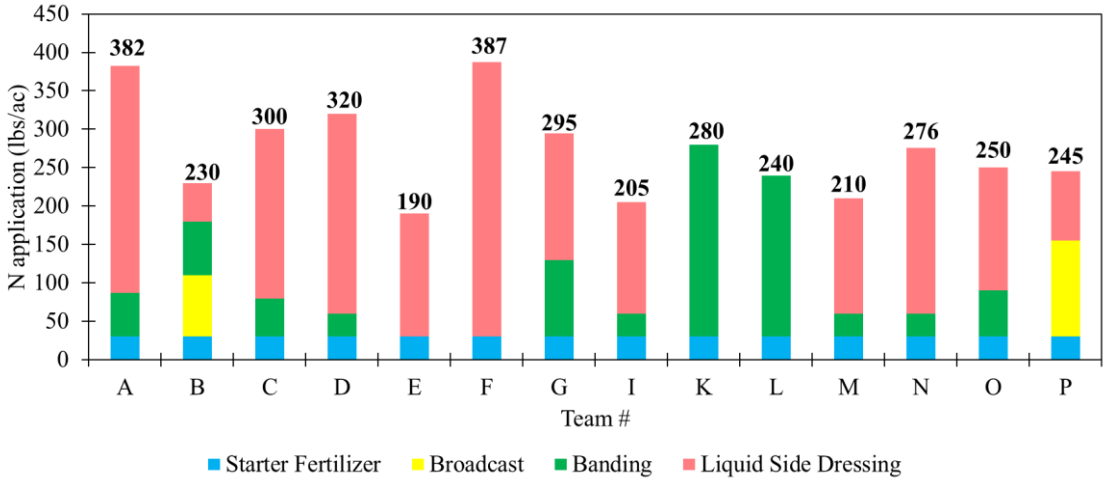
- The high input use is calculated based on Water-Nitrogen use efficiency:

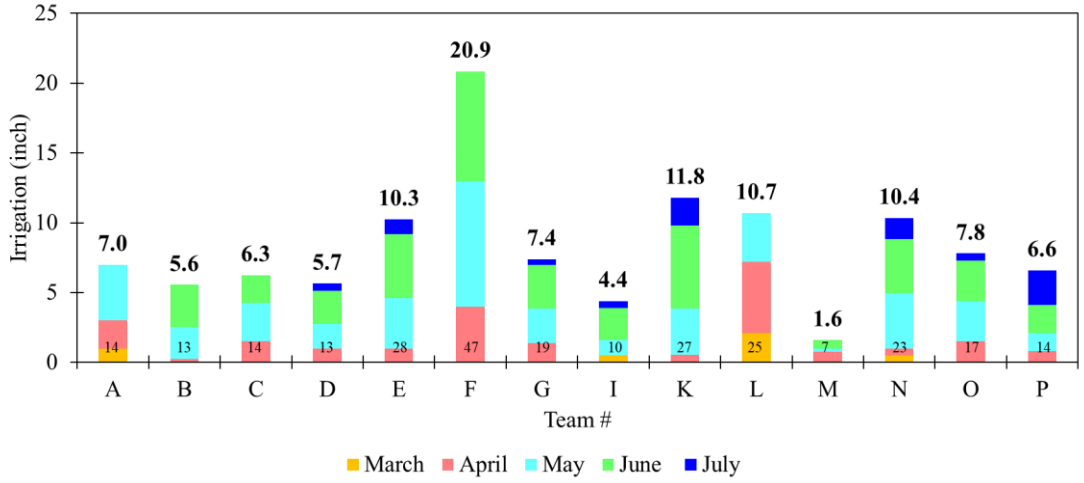
$$IWUE = \frac{LY_i - LY_c}{I}$$

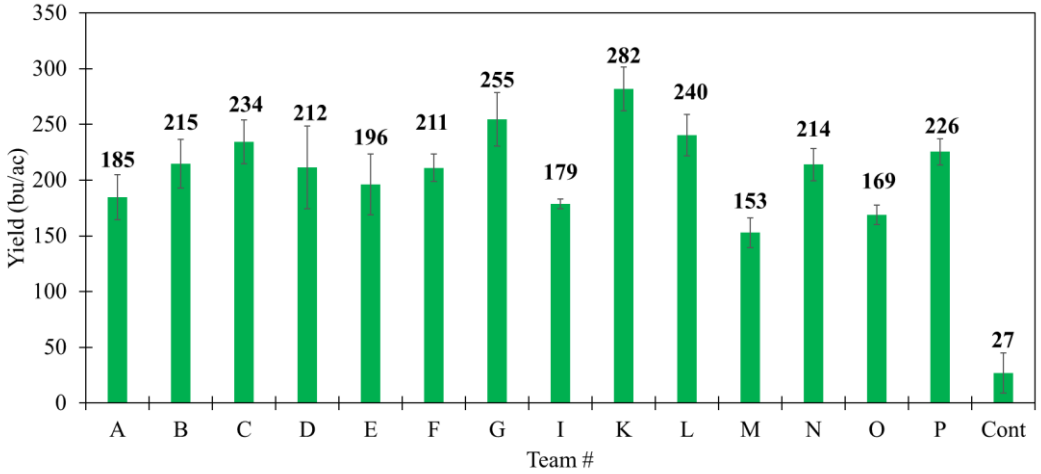
$$NUE = \frac{LY_i - LY_c}{N}$$

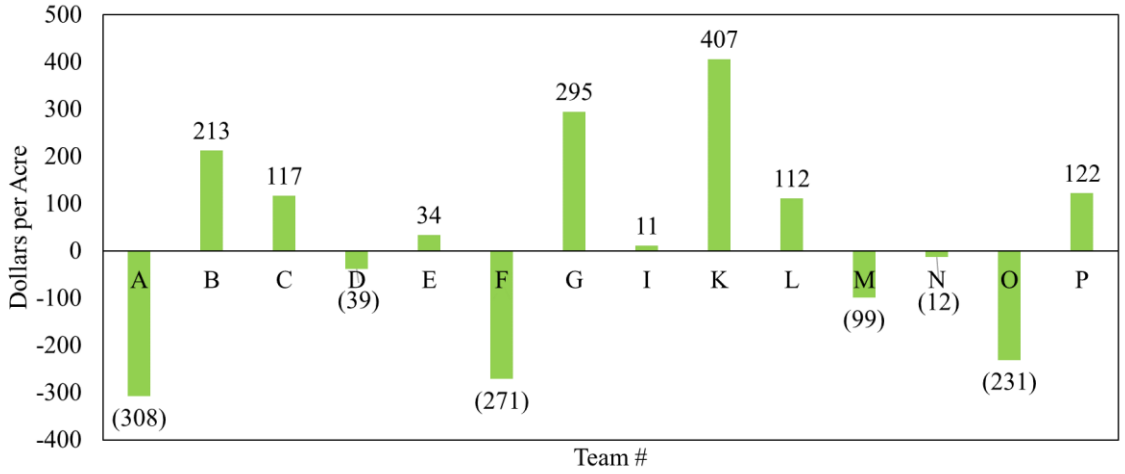
Where, LY_i and LY_c is the lint yield for irrigated and control plots, I and N is cumulative seasonal irrigation and nitrogen.

Corn Contest 2023 Results









Corn Contest 2023 Winners

Next Plan of Action

- Reach out to participating teams.
- A workshop will be conducted at the start of the competition to share the competition structure and rules with participating teams.
- A field day will be conducted to highlight the program's progress in the cotton-growing season.
- At the end of the season, a banquet will be conducted to recognize the competition winner.

Florida Stakeholder Engagement Program (STEP)

https://step.ifas.ufl.edu/

Florida Agricultural Soil Moisture Sensor Network

- The premise of the network is to educate producers and extension agents and to work with FDACS to increase producer adoption of irrigation BMPs throughout the state to conserve water.
- The project facilitates in-depth, one-on-one educational opportunities between agents and growers about this beneficial and cost-saving technology. Specific objectives include:
  - Continuous expansion of Florida Ag. soil moisture sensor network
  - Assisting the agents and growers in investigating soil moisture sensors as a water-conserving technology
  - Quantify the operational and financial benefits and challenges of soil moisture sensor technologies in different management practices.
  - Providing information on sensor costs and cost-share funding availability.

Technology Transfer Model

Agent joins network

Agents self-select to participate and begin learning about the technology.

Farmer recruitment

Agents recruit participating farmers.

Applied learning

Agents, specialists, & farmers discuss sensor data & how it can be applied real-time.

Integrating knowledge

Farmers use sensor data to modify irrigation management.

Outcomes

Farmers & agents increase KASA
Farmers adopt technology
Improved water use efficiency
Improve water quality

Sensor Technologies

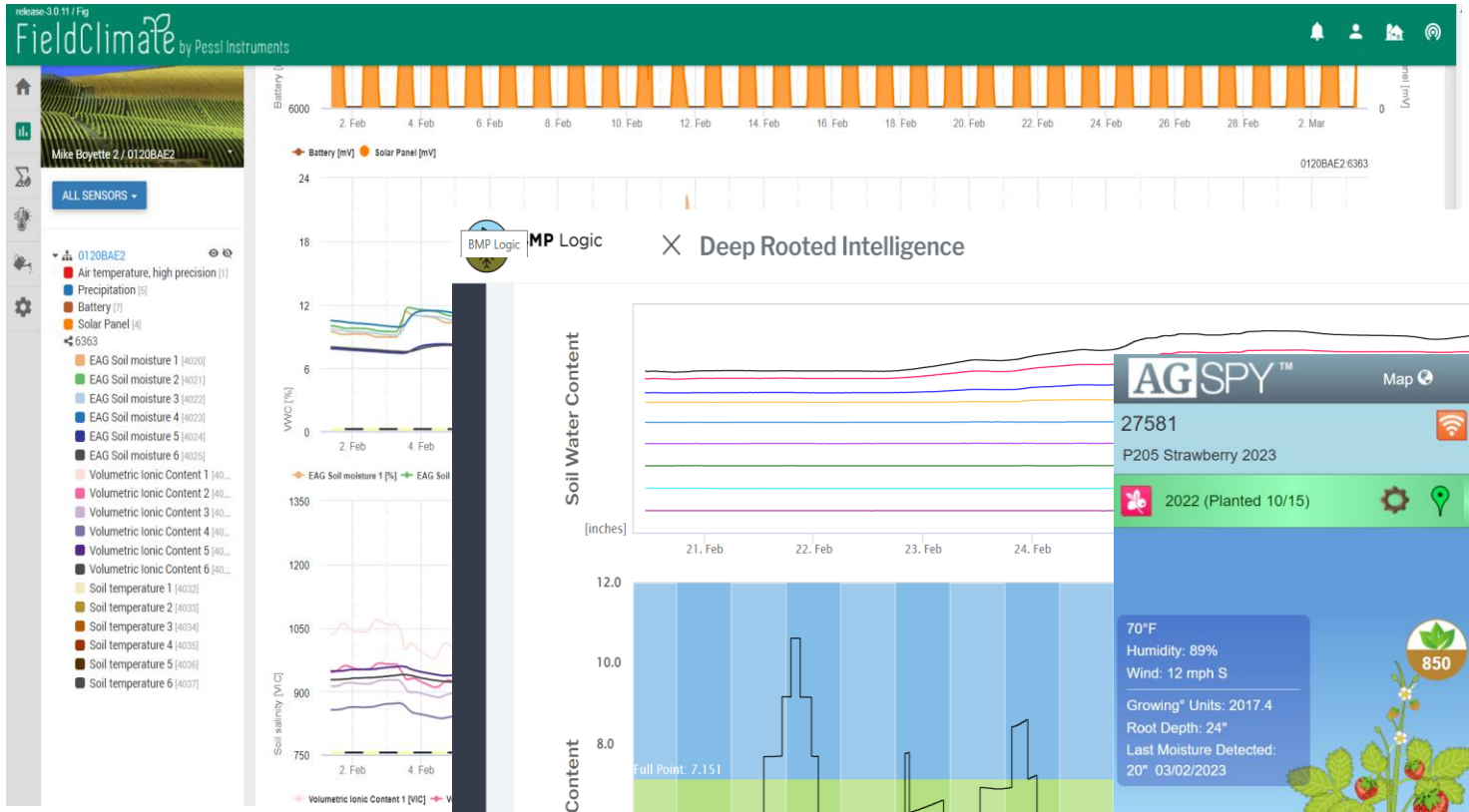
- The project seeks to use the most appropriate, cost-effective, and advanced technology to expand the soil moisture network in the state of Florida.

Sentek Drill and Drop Sensors

BMP Logic

AquaSpy

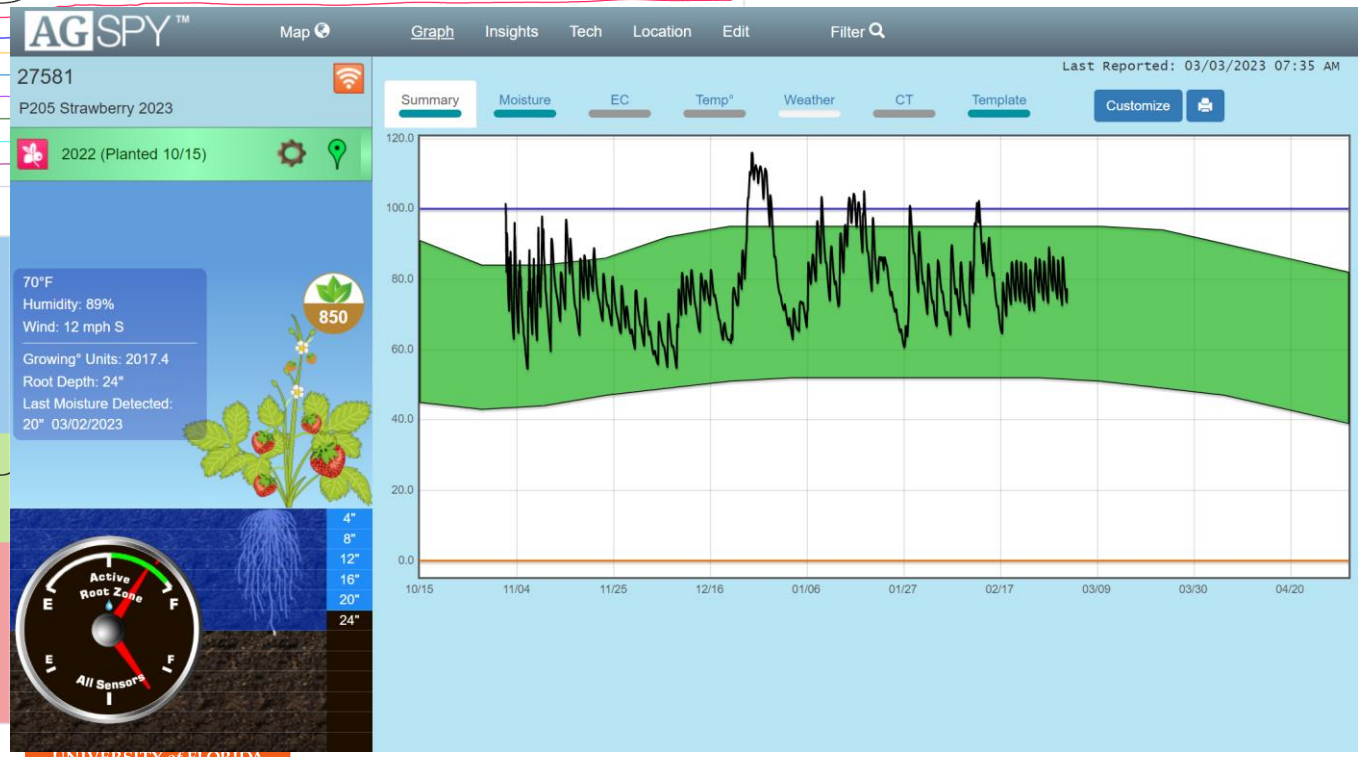
Data Visualization



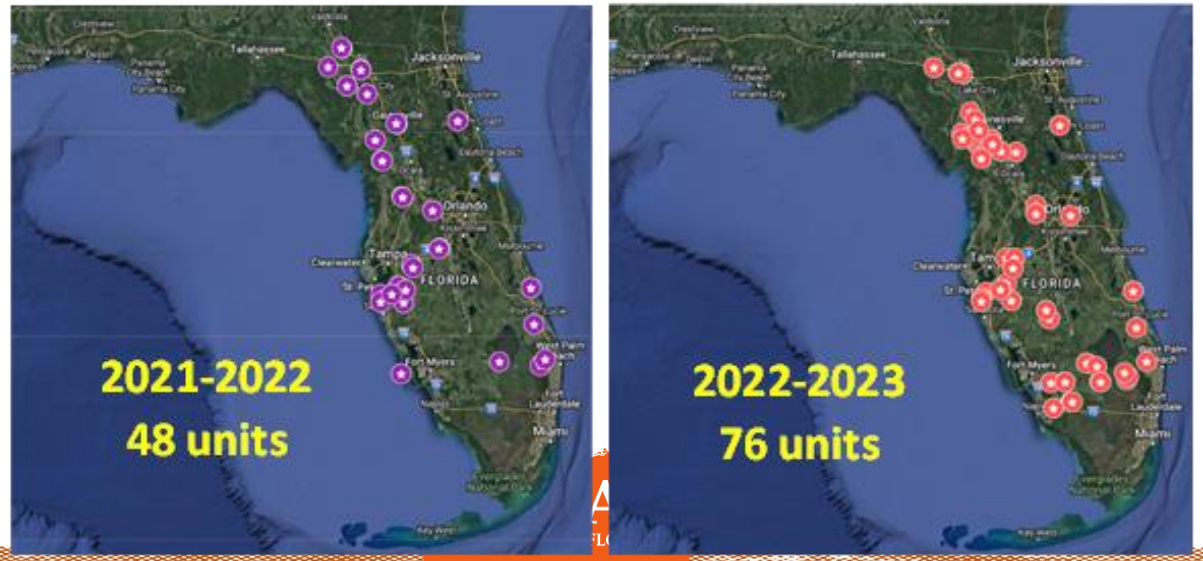
Field Climate

Irrimeter

AquaSpy



Network Expansion



Crops Covered

- Corn
- Peanuts
- Peaches
- Watermelon
- Strawberry
- Citrus
- Nursery
- Cabbage
- Tomatoes
- Potatoes
- Blueberry
- Mango
- Dragon fruit
- Beans
- Cilantro
- Spinach
- Pepper
- Sugarcane
- Squash
- Pumpkin
- Stevia
- Sod

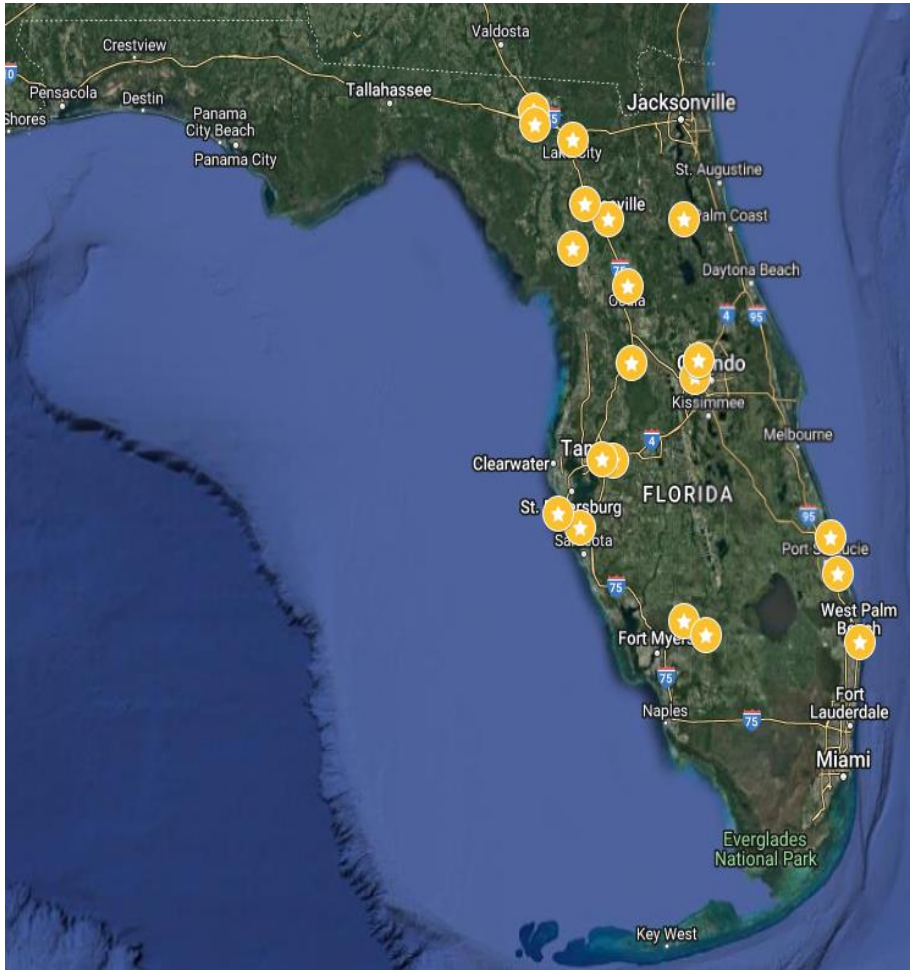
Extension Agent Network



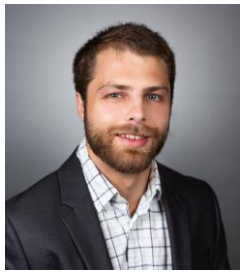














Florida Agricultural Soil Moisture Sensor Network

- The network is bringing cultural and behavioral changes in technology implementation resulting in water conservation, nutrient, and energy savings.

- About **80% of the participants** who participated (**around 1026 since 2020**) in extension activities have gained additional knowledge on soil moisture technologies and irrigation management.

- Because of the continuous educational effort by the network, since 2020, the Suwannee River Water Management District alone has approved funding for **601 soil moisture probes** as a part of the cost-share programs, **representing 49,000 acres**.

- Since 2020, the St. Jones River Water Management District has approved **207 soil moisture sensor** probes as a part of the cost-share program.

- On average, the water conservation that was observed/reported by network ranged from **0.5 inches to 1.5-inchs per growing season** depending on the crop type and climatic conditions.

Thank you for your attention!
Questions

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