

Facilitating the Adoption of BMPs Through On-Farm Nutrient Management Trials in North Florida

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Educational Objectives

Field corn is an important commodity crop in the Suwannee Valley region of North Florida. Compared to other row crops, such as peanuts, field corn requires higher nitrogen fertilizer inputs to obtain an optimal yield. Field corn also requires irrigation generally sourced from groundwater. The Suwannee Valley contains the Suwannee and Santa Fe rivers along with their associated springs. Best Management Action Plans have been implemented for both the Suwannee and Santa Fe rivers to reduce nutrient runoff/leaching and conserve water resources. In this project, Extension agents worked with a farmer cooperator in Columbia County for two years and a farmer cooperator in Suwannee County for one year to implement Best Management Practices (BMPs) for managing fertilizer and irrigation inputs. The farmer cooperators also compared the banding of control release fertilizer to the broadcasting of conventional fertilizer (standard grower practice) in an on-farm demonstration trial. The program was a partnership between UF/IFAS Columbia and Suwannee County Extension agents, the North Florida Research and Education Center – Suwannee Valley (NFREC-SV), and the UF/IFAS State BMP Coordinator. The goal of the program was to educate local farmers on BMPs and facilitate the adoption of agricultural cost-share to reduce nutrient inputs and conserve water resources.

Educational Objectives

- Asses the practice of banding control release fertilizer to increase yields and nutrient use efficiency.
- Educate farmers on BMPs to reduce nutrient loss and conserve irrigation water.
- Educate farmers on acquiring available producer grants and agricultural cost-share.

Program Activities

- The on-farm trials were funded by a BMP Mini-Grant for 2019 field corn season (\$5,250), the Stetson Sustainable Farming Fund for the 2020 field corn season (\$13,017), and an additional BMP Mini-Grant for the 2021 field corn season (\$10,000). Grant funds allowed for the purchase of control release fertilizer, transport of side dressing equipment, and plant tissue/soil nitrate analysis.
- In 2019, the trial results were presented at two producer meetings in Columbia County: the BMP Field Day and the BMP and Forage meetings. An additional presentation was conducted at the 2019 Corn Field Day at the NFREC-SV.
- Educational factsheets, two blog posts, and two educational videos were created to disseminate project results, which were shared using social media.
- Regular visits to the cooperating farmer's fields allowed Extension agents to collect plant tissue/soil nitrate samples and scout for plant health issues.

Teaching Methods

- This program allowed for cooperating farmers to learn by implementing the practices on their farms. Soil moisture sensors were provided through the NFREC-SV loaner program or grant funds. The growers learned how to use the soil moisture sensors through consultations with UF/IFAS Extension agents. Side dressing and banding equipment were provided for the application of fertilizer.
- Educational material was created along with field day presentations to disseminate trial results.
- Farmers were informed of available agricultural cost-share on equipment such as soil moisture sensors and side dressing rigs through announcements by representatives from the Suwannee River Water Management District (SRWMD) during educational meetings. Extension agents also educated growers on available cost-share and producer grants through farm visits and consultations.
- The cooperating growers served as model farms in the Suwannee Valley agricultural community. One of the cooperators agreed to speak on camera in two educational videos to share his experience of using soil moisture sensors to conserve irrigation water, prevent nutrient loss, and save money.

Results

- Over the past two years of the program, 83 farmers and stakeholders attended educational meetings in Columbia County and at the NFREC-SV, where the trial results were presented.
- Both the Columbia and Suwannee County farmer cooperators pursued cost share to obtain soil moisture sensors through the SRWMD. The Columbia County cooperator used cost-share available through SRWMD to obtain a side dressing rig. The Columbia County Extension agent also assisted him with a grant proposal to obtain a no-till drill (Great Plains Model 1006NT).
- The educational blog post titled "Field Corn Nutrient Management On-Farm Trial" was viewed 38 times, the educational blog post titled "Agricultural Cost Share Opportunities" was viewed 87 times, the educational video titled "BMP Farm Series - Ronald Norris

Farms” was viewed 241 times on YouTube, and the educational video “Agricultural Cost Share Opportunities” was viewed 81 times on YouTube.

- One producer in Columbia County will band control release fertilizer on approximately 89 acres of field and silage corn during the 2021 season after learning about the project.

Impact Statement

- The Columbia County cooperator utilized cost share to obtain soil moisture sensors and side dressing equipment. After learning how to use the soil moisture sensor, he found he was over-irrigating by applying 1 inch of irrigation water per irrigation event. The farmer now irrigates closer to 0.6 inches every irrigation event, which is a 40% reduction in irrigation water use. The cooperator found the soil moisture sensor also helped with determining when his crop needs irrigation. During the 2020 season, the soil moisture sensor reduced the farmer’s total irrigation water usage by 130,344 gallons. It is estimated farmers can apply 30% less fertilizer when they side-dress fertilizer compared to broadcasting. The side dressing rig allows the Columbia County cooperator to make more efficient fertilizer applications by placing fertilizer close to plant roots rather than broadcasting fertilizer, which involves uniformly spreading fertilizer throughout the field. At the Columbia County farm, increases in yield were found during the 2019 and 2020 seasons of the trial in the banded control release fertilizer treatment compared to the broadcasted conventional fertilizer treatment. Soil nitrate data indicated a more gradual release of nitrogen in the banded control release treatment compared to the broadcasted conventional fertilizer treatment. UF/IFAS Columbia County Extension assisted the farmer in applying for a no-till drill through the Stetson Sustainable Farming Fund. The farmer was awarded the no-till drill, which allows him to plant cover crops, efficiently place fertilizer on top of the row, and build soil health through minimizing soil disturbance.
- The trial helped educate the Suwannee County cooperator on the available cost-share for soil moisture sensors, which he pursued through the SRWMD. The soil moisture sensors allowed the farmer to manage his irrigation events efficiently. At the Suwannee County farm during the 2020 season, yields did not increase in the banded control release treatment. Soil nitrate data indicated increased nitrogen use efficiency in the banded control release fertilizer treatment due to the gradual release of nutrients over time.

Evaluation

The adoption of BMPs and agricultural cost-share was used to measure the programs significance. Farm visits and follow-up conversations were used to quantify the impacts of implementing these practices.