BMP Update

A production of the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Best Management Practices Program

SPRING 2018 Volume 4, Issue 2

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Upcoming Events

April 17-18, 2018: AgriTech (annual strawberry meeting), Plant City, FL

April 18, 2018: Spring Vegetable Growers Meeting, Beef's Parrish, FL

April 25, 2018: Central Florida BMP Field Day, Gulf Coast Research and Education Center, Balm, FL

May 3, 2018: Macadamia Growers BMP Workshop, Hillsborough County Extension Center, Mango, FL

May 9, 2018: Alternative Crops, Lake County Extension Center, Tavares, FL

May 10, 2018: Cut Foliage Field Day, Pierson, FL

For more information visit BMP Calendar

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Status of Implementation of BMPs

Florida's farmers and ranchers have taken the lead in adopting the use of Best Management Practices (BMPs) for management of nutrients, irrigation, and protection of water resources for many years. The widespread use of these practices is not well known outside of the agricultural community. The public should know about how widely these practices are used and the benefits they provide protecting water resources in the state. Data is being collected to document the effort of growers to hep tell the story. That is important for the continued support of this non-regulatory, incentive-based approach to achieving water conservation and water quality goals for agriculture.

To make the process of collecting information consistent, practical, and efficient for the diversity of agricultural practices in the state, and to meet legislative deadlines for collecting and reporting the information, FDACS has developed a set of Core Practices by identifying common elements in all the BMP manuals. This set of practices is the basis for data collection and reporting on the status of implementation. The Core Practices are organized into three categories: Nutrient Management, Irrigation Management, and Water Resources Protection.

For more information about the data collection effort please click HERE

How to Enroll in BMPs?

1. Schedule a meeting with FDACS Office of Agricultural Water Policy field staff, who will provide a free FDACS BMP manual and other BMP-related information.
2. Participate with the field staff in a free assessment of your operation to determine which BMPs apply to you.
3. Work with the field staff to fill out a BMP checklist and sign the Notice of Intent to implement the BMPs.
4. Keep a copy of the checklist and signed Notice of Intent in your records.
5. Implement and maintain the applicable BMPs and keep adequate records to maintain a presumption of compliance with state water-quality standards.

Visit FDACS website to find an FDACS BMP coordinator near you

Cost-Share Programs

FDACS's Office of Agricultural Water Policy works with local Soil & Water Conservation Districts and Resource Conservation Districts to provide a cost-share program to assist Florida's farmers and ranchers with implementation of BMPs. Subject to the availability of state-appropriated funds, cost-share may provide up to 75% of the cost of eligible projects. Applicants must be enrolled in the FDACS BMP program and be in active production. The U.S. Dept of Agriculture's Natural Resources Conservation Service, and Florida's water management districts also operate cost-share programs to assist farmers in implementing BMPs. For more information on currently available FDACS cost-share, please contact us at AgBMPHelp@FreshFromFlorida.com.

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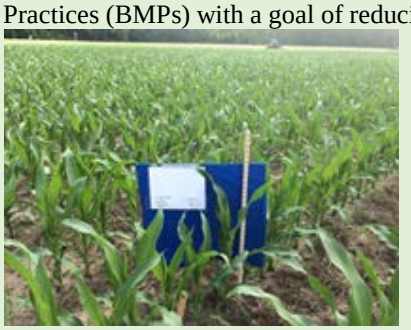
Refining IFAS nitrogen. Recommendation rates through nutrient budgeting of irrigated corn in the Suwannee River Basin to improve water quality

Patrick Troy, Regional Specialized Agent, Live Oak, FL

Joel Love, BMP Education and Training Coordinator-Dann Fenneman, Madison County Extension,-Keith Wynn, Hamilton County Extension,-Buck Carpenter, Soil conservation Service (Madison & Hamilton Counties), Ryan Lawson, Soil Conservation Service (Suwannee County)

SUMMARY:

Driven by the proposed 2018 adoption of the Basin Management Action Plan for the Suwannee River Basin (BMAP), more emphasis is being placed on irrigation and nutrient management in the area. All farmers in the region are encouraged to enroll in Best Management Practices (BMPs) with a goal of reducing the overall nutrient footprint from farming (DEP 2016). Plant tissue sampling is one of tools that has proven to be a valuable gauge of crop nutrient uptake. This past year UF/IFAS extension staff collaborated with two growers to do in-season testing to develop more accurate budgets for nitrogen application. Soil moisture sensors (SMS) were also added to both fields to help plan irrigation scheduling and amounts. Through weekly visits, the growers had trustworthy data on corn N sufficiency levels and could accordingly adjust their fertility timing and amounts. Such responsiveness is exactly the goal of implementing BMPs. Both growers in this study stacked BMP practices upon each other to maximize the efficiency of their system. The full bundle included: grid soil sampling, poultry manure additions, the use of SMS monitoring, multiple side dressed fertilizer applications, multiple UAN liquid fertilizer applications, and leaf tissue analysis. Following the philosophy of the 4R's of fertilizer application (right source, right rate, right timing and right placement), proper implementation of these BMPs should provide good yields while reducing the risk to nitrate leaching.



ACCOMPLISHMENTS:

Building off of similar demonstrations last year, this grant utilized on-farm trials to showcase the value of BMPs with a specific focus on nitrogen use efficiency by way of regular plant tissue sampling and irrigation monitoring with Soil Moisture Sensors. The Extension goal was to use this data and the word of mouth advertising from these two farms to host workshops to share the results. As of the writing of this report, three education and training sessions for better nutrient and irrigation management were held with 358 attendees. Knowing the ratio of inputs for various farms will enable us to compare management practices with final yield outcomes. Such information will be distributed to wider FDACS and SRWMD audiences for further implementation of these conservation measures and potential cost share program modifications.

ONGOING EFFORTS:

Growers in the SRWMD (a 12-county region) have a strong interest in high input crops like irrigated corn. Strong interest from various industry representatives promoting consulting services and precision agriculture technologies manifested itself this season through regular field visits and sponsorships for each of the UF/IFAS events including Holder Ag Inc, BMP Logic, Mayo Fertilizers, and the Live Oak Farmers Cooperative

CHALLENGES:

Through these extension and demonstration efforts, we learned the biggest challenge to farmer adoption of BMPs is infrastructure. Whereas some of the practices can be sub-contracted to consultants for grid soil sampling and plant tissue testing, irrigation and fertility and irrigation applications are typically done by the farmer themselves. On the other hand, with limited equipment distributors of side dress machinery in the area, local representatives do not have the capacity to service or advise farmers throughout the season. This is certainly an area where more needs to be done in demonstrating the value of side dressing fertilizer. Lack of equipment availability and proof of concept are true barriers to entry for this practice. Further study into each of the BMP practices may help in spelling out where size and economics impact these decisions.

LESSONS LEARNED:

Irrigation and nutrient budgeting may best be accomplished during the winter and monitored throughout the crop season. Additionally, a keen eye to the crop maturity and weather conditions starts with curiosity and a focus on efficiency. Even a well-developed fertility plan can fall short with variable rainfall and temperatures. Timely and adequate delivery of water means timely and adequate plant nutrition. As corn is a hungry crop, critical stages of development need to be met with appropriate amounts and placement of fertilizers. Increased knowledge and specific corn nitrogen data for farmers will aid farmers in making BMP decisions throughout the season. FDACS and Extension Agents will have stronger numbers and leverage to convince participants as to the value of nitrogen investments. Early adopters with strong analytics will advance this effort as a champion for widespread implementation and serve as justification for further State funding in this regard.

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Using irrigation apps and soil moisture sensors in the Western Panhandle

Libbie Johnson, UF/IFAS Extension Escambia County

Local Situation:

Irrigation is increasingly common for peanut and cotton production to mitigate risk associated with drought, yield stability, and harvest quality. Producers often utilize anecdotal evidence for irrigation timing. That is, they scratch the soil and base irrigation decisions on previous experience and weather patterns. With the advent of mobile apps, guesswork is replaced by data-based decision support tools, such as the SmartIrrigation (SI) Cotton app and PeanutFARM (Field Agronomic Resource Manager). Peanut and cotton are the most commonly grown row crops in Escambia County.

The PeanutFARM decision support tool was created by the University of Florida with funding from the Florida Peanut Producers Association and the National Peanut Board. PeanutFARM is an online tool to help growers manage peanut irrigation based on adjusted growing degree day (aGDD) models, local weather data, planting date, variety, and soil type. Individual fields are managed separately and processed by PeanutFARM to accurately predict the need for irrigation as well as optimal harvest time. The SI Cotton app was developed by UF/IFAS and UGA to calculate the water balance deficit in a given field. Similar to PeanutFARM, water deficit is based on planting date, location, local weather station data, soil texture, and previous irrigation rates and dates.

In a county like Escambia, there is no weather station with sufficient data for the farmers to obtain accurate information to determine irrigation timing and amounts. Only experience and guesswork are available to support farmers with irrigation management decisions. Installation of demonstration soil moisture sensors and figuring out to best manage the data and information gathered through trials on our local soils and management with help other farmers to utilize this technology better. A grower who masters his irrigation will be better able to manage fertilizer applications and other inputs.

Background:

Of the 105,420 cotton acres grown in Florida in 2012, 37.5% of those acres were in Escambia and Santa Rosa counties. Irrigated land in those two counties alone rose to 7071 acres in 2012, up from 5114 acres in 2007. In 2012, 14.5% of Florida cotton acreage received irrigation (NASS, 2014). In Escambia County, 11.8% of the 13,792 acres planted in peanut were irrigated in 2012 (NASS, 2014). The trend toward increased irrigation acreage in the panhandle of Florida is expected to continue, and IFAS needs to be prepared to address critical water management issues with evidence-based recommendations for irrigation. This on-farm demonstration and field day will provide needed information about irrigation in the area and inform future research and extension work concerning irrigation in this part of the state.

Objectives:

1. Provide quantified soil moisture data to producers for the determination of irrigation timing and amounts.
2. Ground-truth the PeanutFARM and SI Cotton apps in Escambia County by comparing actual irrigation practices with those recommended by UF decision support tools.
3. Fine-tune these decision support tools for growers in the western Panhandle.
4. Demonstrate various ways to measure soil moisture and how to use these tools on operating farms.

Methods:

We have had a VERY wet spring and early summer. One BMP Logic probe was installed and generated data. We had Decagon GS1 soil moisture sensors, dataloggers with telemetry, software for data download, posts for mounting dataloggers, splice kits for broken wires, and other supplies ready to install, but it did not dry out enough for us to get the equipment installed. The BMP Logic probe was installed in an irrigated cotton field to demonstrate how this equipment can be used to see irrigation application infiltration and nutrient movement in the soil. The cooperator farmer managed this field using an online application.

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Field Demonstration on Fertilizers to Promote BMP for Vegetable Production

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Project:

Application of controlled-release fertilizer (CRF) has shown great advantages in improving crop yield, reducing labor cost from farming operation, promoting fertilizer use efficiency, and protecting environment for a sustainable development in agriculture. However, a relatively higher price for CRF as compared to conventional fertilizer (CoF) is one of the main obstacles for growers. In addition, a feasibility of the right source of fertilizers also depends on right crops associated with good management practices, especially water management.

To compare these two different fertilizers in vegetable crops, a field demonstration trial was conducted on the Experimental Farm from February 21st to April 25th, 2017. In this trial, snap beans was planted with application of two different fertilizers: controlled-release fertilizer (CRF) and a conventional fertilizer (CoF) with the same rate of pure nutrients, i.e. N, P, and K. And overhead irrigation system was set up with a watering schedule of twice a week depending on weather conditions.

The result showed that the pod yield of snap beans was 121 bushels/ac with the treatment of CRF as compared 135 bushels/ac with CoF (30-lb bushel) without a significant difference. The application of CRF did not display an obvious advantage under the experimental conditions. In addition, the feasibility for applying CRF could be a concern because of the higher price compared to CoF, about $1 per lb. for the particular formula of CRF (16-6-13), which is about a twice of cost for CoF. However, one of obvious advantages to apply CRF is only one-time application as basal dressing, which can save labor and machinery costs from side dressing with CoF. More importantly, implementing CRF can promote Best Management Practices (BMPs) because it can improve fertilizer use efficiency, reduce nutrient leaching, and protect surface and subsurface water systems, which are critically important for sustainable agriculture.

Experimental design and field management:

The land was evenly flatted, disked twice, measured and marked with color flags for various treatments and replicates. A randomized block design was set up for snap beans with two treatments of fertilizers, Controlled-Release Fertilizer (CRF) and Conventional Fertilizer (CoF), and each treatment had 4 replications. Each plot was 72 x 150 ft with 12 rows of snap beans, two rows of overhead irrigation system were set up to cover the entire field, and a 6-ft wide driveway across the field was to separate these two different fertilizer treatments.

A Monosem planter was used to apply fertilizers and to sow seeds simultaneously. The fertilizer target rates for both types were N 80 lb/ac, P_2O_5 30 lb/ac, and K_2O 65 lb/ac, the fertilizer formulas are 16-6-13 for CRF, and 8-12-12 (N-P_2O_5-K_2O in percentage) for CoF, respectively. Therefore, 500 lb/ac of CRF and 250 lb/ac of CoF were basal dressed at planting, and 130 lb/ac of urea (60 lb N) and 55 lb per acre of KCl (35 lb K_2O) were applied in side dressing by hand after 3 weeks of planting for CoF and CRF, respectively, to compensate the deficits of N in CoF and K in CRF. The side dressing rates was adjusted based on the actual rate at planting to ensure the same amount of major nutrients for both fertilizers.

Snap beans were sown in the rate of 50 lb/ac. A pre-emergence herbicide, Sandea was broadcasted in a rate of 0.75 fl oz/ac immediately after planting. Overhead irrigation was set up to provide irrigation water with a schedule of twice a week, and a field management for pest control was arranged and conducted.

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Pesticides were applied twice a week with foliar application and rotated with various modes of action to reduce pest resistance. An integrated pest management plan was carried out by the field crew. At 40 days snap beans were sampled from each replicate to measure the amount of dry biomass, Snap beans were harvested by hand, in 30 ft long plots, each plot with 6 rows from each replicate, gross weight was recorded and then separated pods from plants to measure the gross weight and pod yield from different plots.

This result implies that under the current experimental conditions, application of conventional fertilizer (8-12-12) as basal dressing in 25% of the total N plus side dressing 75% of N in urea can improve the growth and development of snap beans. It also implies that this polymer coated CRF with a maximum release rate of 2-3 months may not be able to provide enough nutrients to the crops in such a short period.

Regarding the pod yield of snap beans, there was no significant difference found between CoF and CRF though the treatment of CoF performed relatively better than that of CRF, 135 bushel/ac vs. 121 bushel/ac,. The gross weight of total biomass (fresh) at the harvest time showed the same result as the pod yield of snap beans for both fertilizers because some plants were still flowering with CRF but the others with CoF were full of pods which might be another reason to have caused the lower yield with CRF.

One of possible reasons in a relatively lower yield with CRF might be that an insufficient water supply with the overhead irrigation system constrains the release rate of available nutrients from CRF because appropriate soil moisture is essential to release the nutrients from the polymer coatings. Overhead irrigation is a major system for snap beans in this area but a low irrigation frequency (twice per week) may impact the growth and development of snap beans severely.

Conclusions:

As a result, the application of controlled-release fertilizer did not show the yield increase for snap beans under the experimental condition. A lack of sufficient irrigation water supply with an overhead system and the schedule of twice a week watering might be a main reason to constrain the plant growth and development.

The main advantage of applying controlled-release fertilizer is to save the time, the labor cost and machinery operation for side dressing because it can be incorporated into the soil in a total amount at the seeding time.

Sufficient supply of irrigation water is critically important to make such controlled-release fertilizer fully functional. In addition, currently market available controlled-release fertilizers seem to be not suitable for snap beans because the growth period is only about two months or less and such fertilizers need 2-3 months to reach the maximum release rate.