BMP Update

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

Winter 2018 Volume 4, Issue 1

Inside this issue:

What Are Agricultural Best Management Practices?

Agricultural **Best Management Practices** (BMPs) are practical measures that producers can take to reduce the amount of fertilizers, pesticides, animal waste, and other pollutants entering our water resources. They are designed to improve water quality while maintaining agricultural production. The Florida Department of Agriculture and Consumer Services (FDACS) has adopted BMPs for most commodities in the state. Each BMP manual covers key aspects of water quality and water conservation.

How to Enroll in BMPs?

1. Schedule a meeting with an FDACS BMP coordinator, who will provide a free FDACS BMP manual and other BMP-related information.
2. Participate with the coordinator in a free assessment of your operation to determine which BMPs apply to you.
3. 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

New and Revised BMP Manuals



FDACS revises BMPs about every 5 years. Two manuals currently under revision are for Poultry and Sod production. A new small farm BMP manual is under development. This manual will provide a wide range of information for small farmers that are not covered under current manuals.

The Florida Department of Agriculture and Consumer Services maintain updated version of the BMP Rules, Manuals, and other Documents. Electronic copies can be downloaded from the FDACS

Contact Information

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Cost-Share Programs

Florida Department of Agriculture and Consumer Services (FDACS) works with multiple partners, including the U.S. Department of Agriculture's Natural Resources Conservation Service, FDEP, Florida's water management districts, and Florida's soil and water conservation districts, to provide funds that 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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UF IFAS Extension
UNIVERSITY of FLORIDA

FDACS OAWP Rule 5M-1 January 2018

By Jemy West Hinton, UF/IFAS BMP Program

Attention farmers and ranchers. We want to give you a heads-up about a recent rule associated with the Florida Agricultural Best Management Practices Program (BMPs) that was written by the Department of Agriculture and Consumer Services (FDACS) Office of Water Policy (OAWP), and was passed by the legislature. **Implementation Verification Rule 5M-1** provides regulatory assurance to FDACS and the Florida Department of Environmental Protection (DEP) that BMPs designed to meet watershed restoration goals are being implemented by Florida farmers and ranchers.

DEP has tested waterbodies throughout the state and has designated many of them to be impaired below state standards. To improve water quality in these systems, DEP, along with many stakeholders, has established Basin Management Action Plans (BMAPS) statewide.

To address these impairments DEP and stakeholders are implementing strategies to reach BMAP nutrient or bacteria reduction goals. As part of these strategies, regulatory agencies are utilizing environmental permitting to meet their goals while other entities, including counties and local governments that contribute non-point sources of pollution to waterbodies, use other methods to accomplish BMAP objectives. Agriculture is using FDACS-Adopted BMPs to meet water quality goals.

Florida Agriculture BMPs have been extensively used statewide for about two decades. Farmers and ranchers throughout the state have signed Notices of Intent (NOIs) to Implement BMP's with FDACS OAWP and are presumed to be in compliance with state water quality regulations. However, best practices and technology change over time and DEP needs assurance that farmers are still implementing the applicable practices on their NOIs. Because of this, FDACS OAWP developed the Implementation Verification Rule 5M-1.

This rule states that FDACS will verify the BMP Implementation status of agriculture by using self-verification and site visits by staff along with information gathered from other agencies and property appraisers. The information gathered by FDACS is confidential and exempt from public records disclosure.

FDACS OAWP will begin sending self-verification e-mails and letters to producers beginning in January 2018. **It is important that you fill out and return the questionnaire**. If you have any questions or issues with filling out the forms, please do not hesitate to call your Extension Agent for help with any production questions. You may also call a UF/IFAS BMP Implementation Team member or FDACS OAWP staff for any other questions.

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2017 Florida Olive Field Day training of growers, crop advisors and agents in the commercial production of Olive grove management, oil production and field weather data loggers

Karen Stauderman (UF/IFAS Extension Volusia County)

Florida olive grower's knowledge and implementation of all BMPs are recommended, there are a few that are crucial to the success of the BMP program. For commercial olive operations three of these are site considerations, nutrient needs, and the monitoring of weather. These are critical factors that all growers should understand for Best Management Practices (BMP). The goal is to make the growers comfortable with the techniques so that they will implement them and reduce water and fertilizer use. A field day was held on April 7th at

Florida Olive Farm & Mill grove and mill in Live Oak, FL., 74 people attended it was a mixed audience of growers, agents and specialists. During the Florida Olive field day class Karen Stauderman (Volusia County Extension), Dr. Tom Yeager (UF/IFAS), Dr. Kelly Morgan (IFAS), Dr. Juanita Popenoe (Multi-County Extension), Dr. Michael Mulvaney (UF/IFAS), and Dr. Jennifer Gillette-Kaufman (UF/IFAS) taught various subjects. The owner of Florida Olive Farm & Mill began with a tour. He started off explaining the history of his farm, the layout and the concerns that he had with a recent freeze that had damaged the majority of his grove. Dr. Tom Yeager UF Environmental Science Department in Gainesville introduced the basics of field layout, irrigation and topographical considerations when starting a new commercial olive operation. Stauderman demonstrated the importance of weather monitoring in BMP implementation, weather considerations and the importance of accuracy and convenience. She demonstrated the HOBO Onset datalogger and instructed them in the proper placement, mounting and ease of readings in order to incite behavior change to utilize inexpensive technology to monitor rainfall, temperature, leaf wetness, solar, soil moisture and rainfall measurements.

The (co-owner) spoke of the onsite weather station in the grove. He provided testimony of his success in partnering with a weather website that shares grower climate data (Weather underground), Dr. Kelly Morgan from UF/Soil and Water Conservation explained state and federal cost share programs and the importance of following the procedures carefully to increase your chances for funding.

Michael Mulvaney started with a lecture on recommended nutrition use in olive groves and scientific publications that are resources for more in-depth information on nutrient deficiencies and rates. Jennifer Gillette-Kaufman provided user friendly information on scouting your grove for pests, IPM and the importance of obtaining clean plant stock prior to planting. Finally, Juanita Popenoe presented a taste test trial for attendees to try 8 differing olive oils from California, Italy, Spain, Florida and generic mixes. After a sponsored lunch, Erin

Vermillion from Farm Credit of Central Florida explained the availability of loans, rentals and financing programs available to growers. Growers, agents and industry personnel were impressed that Florida Olive Farm & Mill was a clean and state-of-the-art milling operation complete with bottling and labeling. The Carters were able to solicit potential clients for milling of their oil in future visits. An exit survey that indicated perceived increase in knowledge as well as intentions was taken as people left.

Of the 74 attendees, when surveyed on their current weather monitoring practices, 24% reported to using the television weather forecast to monitor the weather, 17% use rain gauges, 24% use cellphone apps, 26% use the internet resources 7% had their own on-site field weather station. 61% correctly remembered that eradication of contaminated fruit and olives were the proper way on preventing the olive fruit fly from establishing in Florida. When asked what helpful information was needed in future field days on olives, the answers ranged from harvesting, variety information, more grower talks and the need for better directions. Overall, the responses were positive, enthusiastic and eager for future research and education from UF/IFAS.

The Volusia County extension agent now has a HOBO Onset data logger so that she can visit nurseries demonstrate and promote the ease and

effectiveness of the new weather technology to growers. Many of the participants thanked the agents for putting on the field day. A commercial grower that attended the field day volunteered the use of her olive grove to assist with this future field day events. All other growers will remain on the agent's active grower list to be notified on future field days that will help their commercial operations. The Olive Field day was recently selected to be presented to the National Association of County Agricultural Agents (NACAA) in Salt Lake City, UT and now considered for acceptance to Extension Professional Associations of Florida (EPAF) in Fort Myers, FL.

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Reducing Irrigation During Freeze Events in Florida Citrus

Freezes in Florida can be very devastating to citrus crops. Orchards are protected from freeze events by running the irrigation system. Extension agents and university specialists have been providing educational programs from South Florida through Central Florida on the use of the Florida Agricultural Weather Network (FAWN) and locally acquired climatic data to precisely schedule irrigation for freeze protection.

Typically irrigation would be turned on when the temperature approached a critical level which could result in tree damage. The irrigation would be left on until the grower felt that there was no potential threat of damage left. The use of the FAWN "Cold Protection Tool Kit" takes into account the critical temperature, wind speed, air temperature and the wet-bulb temperature. The use of these tools allows the producer to confidently end the irrigation when the wet-bulb temperature reaches the critical temperature of the crop being protected.

The use of FAWN has become widely adopted by the citrus industry with roughly 79% of growers surveyed making use of these tools for scheduling freeze protection. It is estimated that the tool kit can reduce irrigation by two hours per freeze event. At a pumping rate of 2,100 gallons/hour/acre over the 525,000 acre citrus crop in Florida, a savings of over one billion gallons of water per hour can be realized. On average, Florida winters produce 5 nights requiring freeze protection for an average saving of (2 hours x 5) 10 hours. So the annual savings due to the adoption of the FAWN tools cold save upwards of 11 billion gallons of water annually.

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Quantifying the effects of corn irrigation and nutrient management on water quality below the crop rootzone in the Suwannee Valley using soil testing, soil moisture sensors, rain gauges and lysimeter technologies

Charles Barret, RSA Water Resources, cebarrett@ufl.edu

Introduction

Corn for grain or silage represented close to 38,775 acres in the Suwannee Valley region in 2012. Suwannee Valley corn producers rely on overhead irrigation and rainfall to meet the estimated 26 billion gallons of water needed to cover the evapotranspiration demand of the crop.

Cost-share programs have been developed to encourage the adoption of BMPs and technologies and now more than 600 soil moisture sensors (SMS) are in use in the area. Growers need to understand the outputs from these devices and would benefit from a quantification the nutrients leached from improperly managed irrigation and fertilizer.

The objectives of this project are to demonstrate the effects of rainfall, irrigation management and fertilizer management on soil moisture content and quantify nitrogen movement below the crop rootzone using an Extension demonstration farm as the vehicle.

Methods

A G3 Drain gauge was installed prior to planting on 09 March 2017 (Fig. 1) at the Suwannee Valley Agricultural Extension Center in Live Oak, FL.

The drain gauge is a passive, closed, wick lysimeter with stainless divergence control connected to an Em50G remote data logger with three GS3 soil moisture, temperature, and electrical conductivity sensors, one G3 pressure transducer/drain gauge and one ECRN-100 high resolution rain gauge (Decagon Devices, Pullman, WA). This equipment configuration was used to monitor soil moisture, temperature and EC, along with rainfall and drainage below the rootzone. The drain gauge was installed with the top of the divergence control structure at two feet below the soil surface (Fig. 1) and the bottom of the reservoir at six feet below the soil surface.

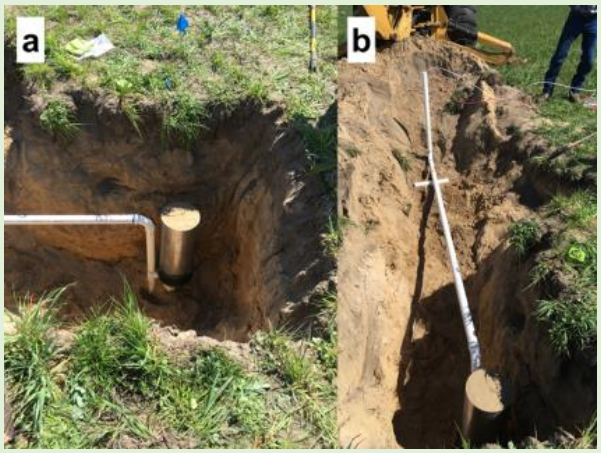

Figure 1. Drain gauge installation showing depth below soil surface (a) and the 2-inch PVC access pipe for the sample tube and pressure transducer cable (b).

The divergence control structure was installed onto the reservoir as a soil monolith of undisturbed soil. The sampling tube and pressure transducer cable were routed 15 feet from the reservoir through 2-inch PVC to the data logger. After the installation, area surrounding the installed drain gauge was then backfilled and leveled with the field soil surface. The drain gauge was installed at a distance from the data logger to allow passage of a tractor and implements directly above lysimeter. With this configuration, the crop was grown directly above the lysimeter and any samples collected in the reservoir should be representative of soil water and nutrients that were leached past the crop rootzone.

Results and Progress

Corn was strip planted (**BMP**) into a terminated mixed cover crop (**BMP**) on 20 March 2017 (Fig. 2).

Figure 2. Corn strip planted into cover crop over drain gauge and lysimeter (orange flags in foreground) installation site.

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Poultry litter was applied after termination of the cover crop at 2-tons per acre, for an application of approximately 36 lb N/acre available for the corn. Liquid starter fertilizer was applied via side dress (**BMP**) at planting at a rate of 44 lb N/acre and granular fertilizer was side dress applied (**BMP**) at the V6 crop growth stage at 50 lb N/acre.

Using two split applications (**BMP**), the remaining 100 lb N/acre fertilizer was injected through the center pivot for a total 236 lb N/acre. Irrigation was scheduled by replacing the crop evapotranspiration and using soil moisture sensors to monitor and adjust soil volumetric water content in the rootzone.

Three major rainfall events accounted for 90% of the rainfall that fell between 20 March and 13 June 2017 with 14.33 inches of 15.87 inches total (Fig. 3).

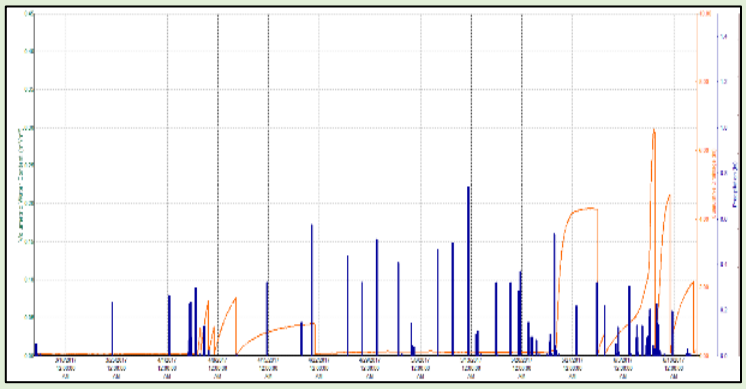

Figure 3. Drain gauge output showing precipitation in inches (blue bars) and cumulative drainage in inches (orange line).

For example, the April rain event was recorded as 4.91 inches and it took 32 hours for sample collection in the lysimeter, 4 feet below the soil surface. However, 3.78 inches of rainfall were collected during the May event, and sample collection in the lysimeter began around 6 hours after the rainfall began.

The differences in time-lapse between rainfall initiation and sample collection between these two events suggests there are many factors that affect leaching. The three major rainfall events triggered 10 leachate sample collections and subsequent submission for analysis.

Five leachate samples have been processed and were analyzed for Nitrate N, Nitrite, Ammonium, P, K, Ca, Mg, Na, Cl, S, B, pH, and EC. Nitrate made up the largest fraction of the total N leached. However, when these data are extrapolated from the units of the lysimeter to values used at the acre scale, both the volume of water leached and the nutrient load lost below the rootzone are suggestive of preferential drainage, corn leaf funneling or some other undetermined factor. Preferential drainage can occur in the passive wick lysimeter when the tension in the lysimeter is more negative than the surrounding soil matrix.

This situation would exaggerate drainage values. Corn leaf funneling occurs because of the "Y" shape architecture of the corn plant. Because the drain gauge was installed directly below a crop row, the funneling effect of the corn crop may have led to higher leachate sample collection than what would be experienced between crop rows. More data are necessary to determine how to accurately account for these drainage characteristics.

The results and information gained from this BMP mini grant were presented on 18 May 2017 (20 participants) at an interagency agricultural team meeting and 06 June 2017 at an IST at FSHS (45 participants).

Participants in these talks were Florida Department of Agriculture and Consumer Services, Soil and Water Conservation District, and Suwannee River Water Management District field technicians, as well as UF/IFAS Extension agents.

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The following projects were awarded 2017-2018, for the Mini Grant Proposals

Author(s)	Granted ($)	Title	Link
Karen Stauderman	7,799.00	Macadamia as an alternative crop in Florida—will it work? A Field day demonstrating commercial production methods, nutrient requirements, Best Management practices including weather data monitoring, irrigation and fertilization	PDF
Karen Stauderman	9,516.00	A Cut Foliage Field Day - Cut foliage growers evaluate soil and tissue samples in second year of testing. Examine BMP guidelines, interpret and smart decision making based on laboratory test results	PDF
Qingren Wang	9,886.00	Demonstration of Drone based Technology to Promote BMP in Vegetable Production	PDF
Juanita Popenoe	302.00	Blueberry Fertilizer and Irrigation BMPs	PDF
David Nistler	2,003.00	Utilizing tissue testing as an on-farm teaching tool to determine crop nutrient needs as part of a comprehensive fertilizer management plan for Union County watermelon and vegetable producers	PDF
Matt Lollar	2,992.00	Soil Moisture Testing Florida Panhandle Vegetable Crops	PDF
Biscaia Da Silva +	9,867.00	Demonstration of best management practices for irrigation and N-fertilizer strategies in Florida potato production	PDF
Maria Silveira	9,790.00	Runoff and Leachate N and P losses from Bahiagrass Pastures Fertilized with Various Biosolids Sources	PDF
Keith Wynn	6,682.50	Developing and verifying water, nutrient and pest BMPS for high tunnel spinach production	PDF
Caitlin Bainum +	10,000.00	Establishment of a large-scale composting system at a commercial equine facility in Marion County to provide experiential learning opportunities in manure and pasture BMPs.	PDF
Shawn Steed	1,267.75	Ornamental Container Tree Fertility Monitoring Demonstration	PDF
Patrick Troy	9,986.00	Improving soil health and nutrient management with cover crops in North Florida through on-farm demonstrations	PDF
Thomas Yeager	2,000.00	CIRRIG BMP Used to Modify Container Nursery Water Allocations	PDF
Tatiana Sanchez	4,573.80	Discovering Soil Moisture Sensing in Vegetable Organic Farming	PDF
John Diaz +	9,804.19	Protecting the Water Quality of Central West Florida by Promoting Waste Management BMPs for Livestock Concentrated Feeding Operations	PDF
Libbie Johnson +	12,850.00	Integrated Cover Crop-Cattle Demonstration for NRCS Incentivization Program in the Western Panhandle	PDF