BMP Update

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

Winter 2017 Volume 3, Issue 1

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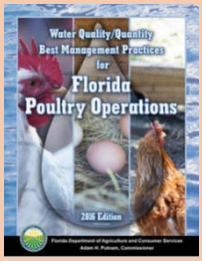
Coming Events

January

Jan 23, 2017: ***Worker Protection Standards Train the Trainer***.
Lake County Extension Center. 10:00 am - 3:00 pm.
New rules require all trainers to be re-certified. Online registration

March

Mar 8, 2017: ***Worker Protection Standards Train the Trainer***.
Lake County Extension Center. 8:00 am – 12:00 pm.
Private Ag Pesticide Applicator License - review and exam. Exams administered after lunch. Online registration



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.

Nutrient Management App

A 4R vegetable crop smartphone app has been developed to provide growers with fertilizer recommendations. Information provided by the app includes 4R concepts of fertilizer materials (source), recommended amounts (rates), crop demand (time), and application practices (place). The app is available for android and i-phones and can be found in your app store by searching 4R. This app is the first in a series of Smartphone apps on fertilizer recommendations and will be followed by other selected commodities.

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

Contact Information

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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.

UF UNIVERSITY of FLORIDA

http://bmp.ifas.ufl.edu/

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Demonstrating Petiole Sap Testing and Soil Moisture Testing as BMPs in the Florida Panhandle

Matt Lollar, Jackson County
Matt Orwat, Washington County
Tom Batey, Jackson Soil & Water Conservation

A project funded by the UF/IFAS BMP Mini-grant Program demonstrated the use of Petiole Sap Meters (Nitrogen and Potassium) and Portable Soil Moisture Sensors.

A Nutrient and Water Management Field Day was held in the spring of 2016 to provide information on use of BMPs in Jackson and Washington Counties.

The objectives of this demonstration was that after attending Nutrient and Water Management Field Days, the attendees would increase their knowledge of better nutrient and water management BMPs and adopt these practices.

Through on-farm consultations, Jackson, Washington, and Holmes County producers utilized Extension as a point-of-contact for nutrient and water management recommendations with a long term objective of reducing nutrient inputs and increased yields.

A large number of vegetable farms in Jackson County are within the Jackson Blue Spring Basin Management Action Plan (BMAP) Area.

A 3 hour Nutrient and Water Management Workshop was held in conjunction with the FDACS Office of Ag Water Policy to introduce farmers to nutrient management techniques and equipment. A total of 43 farmers attended the workshop. As a result of the workshop, 5 (more than 11%) farmers installed remote soil moisture monitoring equipment on their farms.

- Plant petiole sap testing was conducted on 3 watermelon farms in Jackson County representing approximately 54 acres. Petioles have been tested on vines in these fields at the 6-inch length stage, the 2-inch fruit stage, and the fruits one-half mature stage. On average, nitrogen content was 1300 ppm NO_3-N at 6-inch length stage, 1267 ppm NO_3-N at 2-inch fruit stage, and 1050 ppm NO_3-N at one-half mature stage. On average, potassium content was 3400 ppm K at 6-inch length stage, 3950 ppm K at 2-inch fruit stage, and 3900 at one-half mature stage. The nitrogen reading was slightly above optimum range on one farm and the issue was addressed with the operator. The potassium readings were within range at the stages of growth tested.

- Farms continue to call on Extension for technical and practical expertise. The utilization of petiole sap meters and instant gratification has positively propelled Extension to a higher level of prominence in the farming community.

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Impacts of BMP Adoption by Suwannee Valley Watermelon Growers

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Suwannee Valley Agricultural Extension Center

The Suwannee Valley region of North Florida produces nearly one-third of the state's watermelon harvest, valued at $88 million in 2015. Soils in the region are well drained and perfect for watermelon production as long as water and nutrients are efficiently managed. Balancing and maintaining the benefits from productive agriculture, while conserving water resources is a major challenge. Many growers have adopted best management practices (BMPs) that are intended to protect water quality, but the region-wide impacts of changing practices are not widely known. With support from a BMP mini-grant by the Florida Department of Agriculture and Consumer Services (FDACS), we reviewed technical literature and conducted semi-structured interviews with nine Suwannee Valley watermelon growers in spring 2016. We documented changes in the Suwannee Valley watermelon industry and estimated the effects on water, energy, and fertilizer use.

Over the past 25 years, watermelon growers in North Florida started growing seedless watermelon varieties, started using transplants instead of direct seeding, changed from bare ground to plastic mulch, switched from overhead to drip irrigation, and adjusted their fertilization practices. Many growers have started using plant nutrient testing and soil moisture sensing tools to help them fine tune fertilizer applications and irrigation schedules. All interviewed growers now plant watermelons in mounded rows covered by black plastic mulch. The black plastic blocks weeds, reducing the need for herbicide, and warms the soil, allowing earlier planting and therefore earlier harvest. Most interviewed growers described how they can more precisely deliver the nutrients and water their plants need, when it is needed, using BMPs such as tissue, sap and soil tests and applying fertilizer through the drip system.

Watermelon growers in the Suwannee Valley have reduced fuel and fertilizer use, as well as conserving water and reducing the possibility of leaching into our water bodies. In particular, the transition to drip irrigation under plastic mulch has led to dramatic savings in water and fuel. Among the nine growers we interviewed, estimates of water savings ranged from 50% to 80% and estimates of fuel savings ranged from 50% to 86% as a result of changes made since the early 1990s. Fertilizer efficiency also increased significantly with reductions in applied nitrogen per acre of 0-30% and typical yields per acre increasing from 25,000-40,000 pounds to 50,000-60,000 pounds over that time period. The growers we interviewed believed that changes made by other growers were similar to theirs.

To appreciate the magnitude of these changes for the region, we estimated the total amount of water, fuel, and fertilizer saved. An average reduction in water pumped for irrigation of 65% amounts to an estimated water savings of 344,177 gallons per acre per season. On 6,000 acres of watermelon fields in the Suwannee Valley region, that amounts to 2.1 billion gallons of water saved each year. Although fuel and fertilizer savings are more difficult to estimate precisely, the grower interviews and technical documents allow ballpark estimates. We estimate that between 120,000 and 270,000 gallons less fuel is consumed to power irrigation systems and 180,000 pounds less nitrogen is applied on the region's watermelon fields.

Watermelon growers in Florida's Suwannee Valley have made significant changes to their production practices over the past 25 years. More watermelons are being produced with less water and in many cases less nitrogen fertilizer per acre. Improved nitrogen efficiency implies that a greater percentage of applied nitrogen is being taken up by the plant and less nitrogen is being lost to leaching. Similarly, more efficient irrigation through a drip system and soil moisture monitoring implies less leaching. Taken together, these changes indicate a substantial reduction in the likelihood of negative impacts from watermelon production on the region's water quality.

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Impact of the 2016 Florida Water Bill on BMP implementation

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Nitrogen and phosphorus are essential nutrients for plants and animals and are the limiting nutrients in aquatic environments. The correct balance of both nutrients is necessary for a healthy ecosystem; however, excessive nitrogen and/or phosphorus can cause significant water quality problems. Typically, nitrogen is the limiting nutrient in spring and surface water systems. Therefore, even modest increases in nitrogen concentrations above optimum levels can lead to algae blooms, and deplete oxygen levels causing fish kills as we experienced in south Florida in 2016.

In 2016, the Florida legislature created the **Florida Springs and Aquifer Protection Act**, known as the "**Water Bill**", to provide for the protection and restoration of outstanding Florida waters and springs. The bill ensures that the appropriate governmental entities continue to develop and implement uniform water supply planning, consumptive use permitting, and water quality protection programs. The **Department of Environmental Protection** (DEP) is required to complete **basin management action plans** (BMAPs) and the **Department of Agriculture and Consumer Services** (DACS) implementation of **best management practices** (BMPs).

Waterbodies (springs, lakes or streams) that do not meet the established **Water Quality Standards** (WQSs) are deemed impaired and DEP must establish a **total maximum daily load** (TMDL) for the waterbodies. A TMDL is a scientific determination of the maximum amount of a given pollutant that can be absorbed by a waterbody and still meet WQSs. Nonpoint sources are unconfined sources that include leaching or runoff from agricultural lands or residential areas. BMAPs are one of the primary mechanisms the DEP uses to achieve TMDLs. BMAPS are plans for non-regulatory and incentive-based programs, including BMPs, and **cost sharing** programs.

Currently will share cost with growers enrolled in the BMP program at 75% up to $50,000 per year for installation of fertigation equipment, variable rate fertilizer applicators, conversion from high volume (sprinkler) irrigation to low volume (microsprinkler or drip), and other fertilizer and/or water savings programs. Some water management districts have additional cost share programs available to agricultural producers. FDSCS also funds Mobile Irrigation Labs in Florida to assist growers in improving irrigation efficiency.

The Florida BMP program was established in the Florida Watershed Restoration Act and authorizes the FDACS, Office of Agricultural Water Policy (OAWP), to develop agricultural BMPs, and to assist agricultural producers with BMP implementation. The participation of agricultural producers in these BMP programs is important for the following reasons, among others:

- BMP implementation helps demonstrate the agricultural industry's commitment to water resource protection, and thereby helps maintain legislative, agency, and public support for this incentive based approach to reducing agricultural impacts to water resources.

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- Implementation of FDACS-adopted BMPs that the FDEP has verified effective in reducing agricultural water quality impacts provides growers with legal protection by providing a presumption of compliance with WQSs.

- BMPs provide benefits to producers as well as the environment. Many producers have reduced costs and increased yields.

Improved water quality is very important to Florida's economic and environmental future. The **Water Bill** requires enhanced implementation assurance of BMPs by FDACS /OAWP and further development of agricultural water quality monitoring by FDEP. In response to the Water Bill, FDEP and FDACS/OAWP is in the **rule making process** with the **goal of an estimated 30% reduction in agricultural TMDL within the first five years** of establishing a BMAP from implementation of BMPs by agricultural producers.

At the end of this first 5 year period, 100% of agricultural producers within a BMAP must be implementing BMPs or they will be required to monitor on-farm water quality at their expense by FDEP. **A second goal of this rule would be the reduction of TMDL by 80%** within ten years through adoption of advanced or second phase BMPs. Research is required to validate current BMPs state-wide as well as development of second phase BMPs to further reduce grower impact on the environment.

The University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) will increase assistance to agricultural producers to implement BMP requirements of FDACS/OAWP and FDEP focused on improved technology and innovative practices to help preserve and protect Florida's water resources. Nutrient stewardship is a central component of the UF/IFAS research and extension agricultural BMP program.

The goal of UF/IFAS research and extension is to improve water availability (quantity) and quality while increasing our current knowledge of nutrient management on sustainable production, economic profitability, and environmental management. Field research will be required to conduct the needed research on improved agricultural production practices to determine reduced impacts on water quality. Examples of these advanced, or second phase BMPs are:

1) **Crop rotation practices** (including cover crops) to improve nutrient use efficiency,

2) **Bioreactors** to capture nutrients currently in the environment,

3) Improved **animal waste management** practices to reduce off-site nutrient movement,

4) **Prescription application of nutrients and irrigation** to avoid application of excess nutrients to sensitive areas, and

5) **Modeling of nutrient movement** in the environment to access current production practices and lead to improved management Practices.

For additional information on agricultural BMPs, contact your local extension agent or search The UF/IFAS BMP program web site at http://bmp.ifas.ufl.edu/.

A list of FDACS staff ready to answer questions about enrollment in the BMP program or cost share opportunities can be found at UF/IFAs BMP program site above or at http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Organization-Staff

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The following projects were awarded 2016-2017, for the Mini Grant Nutrient Management Demonstrations

Name	Granted	Title	Proposals [pdf]
Karen Stauderman	$7,194.47	Olives as an alternative crop in Volusia County – 5 years later—is it working? Demonstrating weather data monitoring, irrigation and fertilization efficiency, and topography considerations.	Download pdf
Qingren Wang	$8,860.00	Field Demonstration on Controlled-Release Fertilizer to Promote BMP for Vegetable production	Download pdf
Charles Barrett	$10,000.00	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	Download pdf
Libbie Johnson Michael Mulvaney Diane Rowland	$9,200.00	Using irrigation apps and soil moisture sensors in in the western Panhandle	Download pdf
Blake Thaxton John Atkins Michael Mulvaney Libbie Johnson	$9,040.00	Dryland Farmers' Cover Crop Demonstration and Soil Moisture Evaluation	Download pdf
Mace Bauer	$10,000.00	Precision Agriculture Applications and their Impacts in Florida Watersheds	Download pdf
Patrick Troy Jane Griffin Paulette Tomlinson Joel Love Dan Fenneman Jed Dillard Keith Wyann	$8,683.00	Quantifying ecosystem services provided from winter pasture forages and cover crops in North Florida through on-farm demonstrations:	Download pdf
Patrick Troy Joel Love Dan Fenneman Keith Wynn Buck Carpenter Ryan Lawson	$6,223.00	Refining IFAS nitrogen recommendation rates through nutrient budgeting of irrigated corn in the Suwannee River Basin to improve water quality	Download pdf
Ethan Carter, Andrea Aklbertin, Ian Small, Michael Mulvaney,	$7,667.00	Using soil moisture sensors to improve irrigation efficiency: A hands-on workshop and demonstration for row crop farmers in Jackson County, FL	Download pdf