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 4

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.

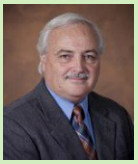
Visit FDACS website to find an FDACS BMP coordinator near you

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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Dryland Farmers' Cover Crop Demonstration and Soil Moisture Evaluation

Blake Thaxton, John Atkins, Dr. Michael Mulvaney, and Libbie Johnson

Local Situation:

Dryland farmers utilize cover crops to maintain soil nutrient status, minimize erosion during the Florida Panhandle's typically wet winters, and to combat certain nematodes for cash crops to follow. This portion of the panhandle, centered on the WFREC in Jay, is primarily row crop agriculture with some cow-calf operations throughout. Crops are often moisture limited, and yields are often affected by variations in rainfall duration, amount, and frequency.

Rainfall amounts and droughts, as experienced in the growing season of 2015 in the western panhandle, lead to a lack of adequate moisture for profitable crop production.

Further study and demonstration of ways to maintain soil moisture through use of significant cover residue is needed to encourage more dryland farmers to establish and manage cover crops. Unlike other parts of the panhandle, irrigation is often not a feasible option due to the depth a well would have to be drilled in order to reach the water table. Cover crops represent a method of maintaining soil moisture from one rain event to the next, along with helping to keep soil in place during heavy rain events.

BMP(s) addressed:

- 1.1 Field and Bed Preparation
- 2.2.1 Bare Ground Nutrient Management

Objectives/Outcomes:

- At the grower meeting and field day, 70% of *participants will* increase their knowledge of benefits of cover crops. Expected participation should be no less than 30 individuals, with a mixture of row crop farmers, University representatives, and local agribusiness.
- Over the course of 1 year, 1 field day and 3 on farm producer contacts will be conducted to demonstrate findings from the project.
- 20% of the farmers who attend the field day will increase his acreage planted in cover crops within the next two years, determined by follow up surveys, conducted either electronically or by one-on-one consultations with an agent.
- Creation of a database of farmers/allied industry personnel that will be used to share information about BMPs and work being done throughout the southeast with cover crops.
- 100% of Agents and faculty associated with this project will increase their understanding of the contribution of soil moisture by cover crops.

Methods:

The project consists of two components. The first was a demonstration on a farm in Santa Rosa County. Two sentec probes were installed by BMP Logic in side by side treatments in a non-irrigated cotton field in Jay, FL.

The first treatment is strip till planted in an early burn down rye cover crop and the second is strip till planted in rolled rye cover crop. These probes will monitor moisture at several depths to see the impact of the cover crop on moisture retention.

Along with the demonstration, a replicated trial is to be installed in another field to be able to statistically analyze the moisture retention of field that implemented cover crops prior to planting the cash crop against a treatment where cover crops were not utilized.

The trial consist of the two treatments with 3 replications. The plots will be monitored using Watchdog dataloggers with WaterScout SMEC sensors (soil moisture, EC, and temperature) and Watermark soil moisture sensors. The replicated trial has not been able to be installed because of the excess rainfall received this spring and summer. AS soon as the field dries out enough, the trial will be deployed.

Demonstrations:

A field day is being planned for August 10th to show the results of the demonstration and replicated trial (depending on the amount of data collected) and to show the use of the soil moisture meters. Attendance will be kept and shared at the end of this program.

Impact:

At the conclusion of the field day an evaluation will be conducted to measure knowledge gain for those who participate. Also, a qualtrics survey will be sent after planting in 2018 to collect information about cover crops utilized after the meeting.

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Vegetable Hurricane Recovery

PLANT RECOVERY AND NUTRITIONAL PROGRAM

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Plant recovery: Tomato plants can sustain considerable wind injury and still recover to produce commercially acceptable yields. Though yields may be reduced compared with undamaged plantings, the potential to capture high prices at a time of limited supply provides a strong incentive to rescue hurricane-damaged plantings rather than abandon or replant. Peppers can recover if they have a strong root system when cut close to the crown. Squash, cucumber and watermelon have very fragile foliage that will not recover.

New transplants: with the unavailability of transplants, be aware of the desired variety name and disease resistance together with the prevailing soil diseases on your farm, especially when planting in beds that have been under water. See the Vegetable Production Handbook variety recommendations (https://edis.ifas.ufl.edu/pdffiles/cv/cv29200.pdf.

Nutritional Program

Drip irrigated fields will not be a problem since it is possible to inject liquid N and K to the drip.

For seepage irrigated fields that need N and K fertilizer, the only methods available will be to punch the dry fertilizer by hand, which is tedious and expensive, or else add liquid fertilizer (via injection wheel). As much as half of the total N and K rate can be punched as dry fertilizer after transplanting or when plants are already in the field (Table l). The rest of the fertilizer can be applied later if needed, when yellowing in the lower leaves or slow, poor growth (N) occurs, or burning appears on leaf edges (K deficiency). See figure 1 for other common plant deficiency symptoms. Don't apply fertilizer after or close to the first harvest, since the fruit is already set and only needs to enlarge. See the Vegetable Production Handbook for N and K UF/IFAS recommendations (https://edis.ifas.ufl.edu/pdffiles/cv/cv29200.pdf.)

Table 1. Hot mix application side dressing N and K rates for plasticulture (tomatoes. peppers, eggplants, etc.)

Number of bands/bed	Distance between holes (inches)	Fertilizer	N and K rate (lb/acres)	Fertilizer rate (lb/acre)	Amount (oz/hole)
1	12	15-0-15	67	447	1
1	18	15-015	67	447	1.5

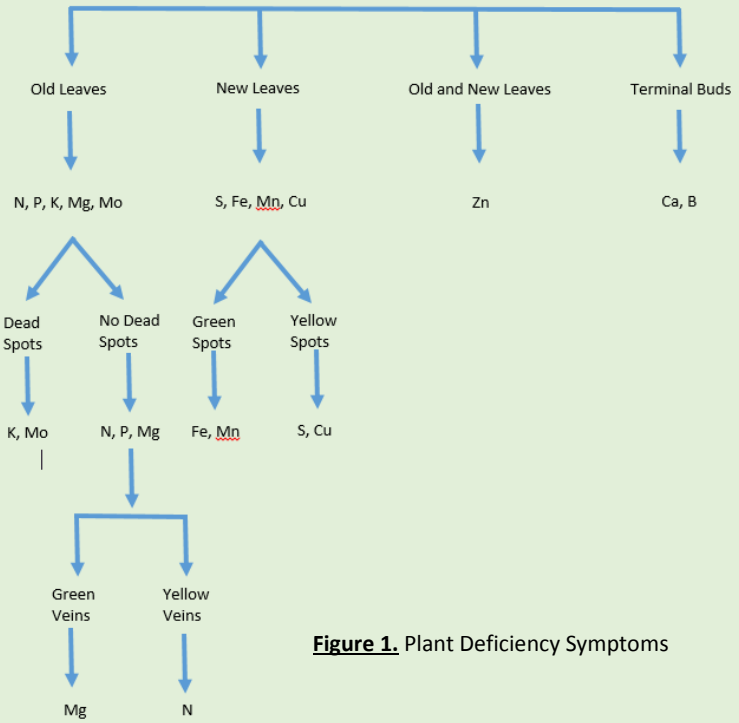

Figure 1. Plant Deficiency Symptoms

PLANT DISEASE MANAGEMENT

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Disease pressure and outbreaks for foliar diseases will depend upon the upcoming environmental conditions for the rest of the growing season, with the possible exception of soilborne diseases. However, even soilborne diseases caused by *Pythium* and *Phytophthora* are favored by wet soil. Continue to follow an Integrated Pest Management program and scout plants frequently and regularly. Identification of the disease at the onset of the outbreak will give the best options including fungicide for disease management.

A Reminder of Integrated Disease Management approaches using Cultural Control Measures:

Excessive handling of plants, such as thinning, pruning and tying, may help spread some diseases, including bacterial spot, tomato mosaic, and bacterial speck. Whenever possible, plants should be handled and harvested when they are driest.

Farm equipment should be periodically decontaminated to reduce between-field pathogen spread.

The use of **plastic mulch** is a very important cultural control for fruit rots in the field to prevent contact between fruit and the soil.

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Production of disease-free transplants is a very important measure for control of many serious problems, especially early blight, late blight, bacterial spot, and several viruses. Use of certified "pathogen-free" seed is also important for some diseases, such as tomato mosaic and bacterial spot.

Destruction of volunteer plants is an important practice in the control of several diseases because it prevents large populations of pathogens from surviving from one crop to another. Crop rotation also works to prevent crop-to-crop survival of specific tomato pathogens.

Rapid crop destruction at the end of the season is crucial for managing Tomato yellow leaf curl virus (TYLCV) and other viral diseases. It is extremely important that crops be destroyed immediately after harvest because this reduces areas where whiteflies can build up and move to new crops. Rapid crop destruction, especially for those crops infected with diseases, can prevent spread of many pathogens.

Manage and remove weeds that can serve as sources of inoculum for viruses and other pathogens during production and the off-season

Damping Off on tomato

Excessive, wet soil conditions can lead to damping-off of seedlings.

Symptoms: Several soil-inhabiting fungi and fungal-like organisms that are almost universal in occurrence cause this disease affecti ng seedlings. These pathogens infect portions of the plant at or below the soil level, resulting in collapse and death of the seedling. Wet conditions are usually most favorable for this disease. Root and crown of seedl ings will be rotted.

While other fungi such as *Fusarium* spp. and *Rhizoctonia* spp. may also cause damping off of seedlings, the majority of damping-off diagnosed at the SWFREC clinic is due to *Pythium* spp. Fungicide recommendations for damping off caused by *Pythium* spp. for **tomato** are below.

Growers may consider applying a fungicide to help limit damage of damping off caused by *Pythium* spp. For Rhizoctonia root rot or other diseases of concern, currently labeled fungicides can be found at Vegetable Disease Handbook, Chapter 17, **Tomato** at http://edis.ifas.ufl.edu/cv137.

As always, it is recommended that a disease diagnostic clinic assist with determining the pathogen associated with the problem in order to make an effective fungicide management Recommendation.

Table 2. Fungicide labeled for damping-off caused by *Pythium* spp. On tomato for field application

Tomato	Fungicide Group	Name Active Ingredient	Rate	Application Comments
	4	Orondis Gold B Ridomil Gold GR Ridomil Gold SL Ultra Flourish (Mefenoxam)	1 pt 20 lb** 2 pt 2 pt	Do not apply more than 1.5 lb mefenoxam/Aper crop to the soil. **See Ridomil Gold GR label for application instructions
	4	Metastar 2E	2 qt	Drip application to soil
	28	Previcure Flex (propamocarb) hydrochloride	1,5 pt/treated ac	Apply to low portion of plant and soil, or as a soil drench, or through drip irrigation

Fusarium Crown Rot Integrated Management

Fusarium crown and root rot is difficult to control in field-grown tomatoes because the pathogen rapidly colonizes sterilized soil and persists for long periods. However, an integration of the following management procedures may help to reduce the impact of crown and root rot:

1. Use disease-free transplants. Transplant houses should not be located near tomato production fields. Avoid over watering, which makes the transplants more susceptible to crown and root rot. Disinfect transplant trays by steaming before reuse.

2. Optimize cultural practices in the field. Avoid injuring transplants when they are set in the field. Physical damage and injury from excessive soluble salts may make young plants more susceptible to crown and root rot. The use of water drawn from wells rather than ditches for watering-in transplants may help to prevent recontamination of fumigated soil. Avoid ammoniacal nitrogen and maintain the soil pH at 6 to 7. Rapidly plow in crop debris following final harvest. Disinfest tomato stakes before reuse, or use new stakes.

3. Rotate with a nonsusceptible crop. Incomplete knowledge of the host range of FORL makes precise recommendations in this area difficult. Current research data suggests that legumi nous crops should be avoided in favor of corn and similar crops. Rotation and intercropping with lettuce had reduced FOR L in greenhouse-grown tomatoes.

4. Significant progress has been made in breeding for resistance to Fusarium crown and root rot in field-grown tomatoes. Although the commonly used commercial varieties do not have resistance, some resistant cultivars are available for field use.

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INSECT AND MITE MANAGEMENT

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Populations of many insect pests such as whiteflies, spidermites, thrips, worms and even pepper weevils were probably negatively affected by the storm and would initially occur in low numbers. Nevertheless, they can build up quickly, so scout regularly to avoid being taken unawares later in the season. Also, preventative soil applications of either imidacloprid, thiamethoxam, dinotefuran, flupyradifurone or cyanatraniliprole should be used as normal in tomato and cucurbits. Consider the use of metalized (UV reflective) mulch as an additional management practice for day-flying pests such as whiteflies, thrips, aphids, pepper weevil and even broad mites, the last of these which use flying insects to move around.

WEED MANAGEMENT

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Hurricane and the associated flooding will impact the weed management in the affected growing season and the following years. Weeds may take advantage of the reduced competitiveness of recovered crops or delayed planting of crops in the affected farms. Also, weed seeds carried into the field by the storm and flood water will cause new weed management problems in the subsequent cropping seasons.

If the crop recovers after the hurricane, chemical weed control using herbicides may be the best option for preventing weed germination and managing emerged weeds. Refer to Vegetable Production Handbook (2017-2018) for more information on herbicides labeled for weed management in vegetables. Also, pay attention to herbicide labels for information like maximum growth stage of the crop at which a specific product can be used. Some herbicide labels also caution against the use of the product if the crop is under any stress.

If planting was delayed due to the hurricane, weeds would thrive in areas as the cropping was not done, and the soil was not covered with a canopy. As flooding associated with a hurricane can move residues from previous herbicide sprayings, a bioassay test in which seeds are planted in affected and non-affected soil samples can be helpful to determine if soils are safe for intended crops.

There are a few herbicides labeled to use on top of the beds, for weed management. To control yellow/purple nutsedge, annual broadleaves and grasses, herbicides such as S- metolachlor (Brawl, Dual Magnum, Medal), and Fomesafen (Reflex) may be used on bed tops, pre-transplant, just prior to laying the plastic. Pay attention to the herbicide labels for the specific pre-transplant intervals.

Also, if possible, for herbicide like S-metolachlor, configure the spray manifolds in such a way as to not spray in a thin band in the very middle of the bed. Refer to Vegetable Production Handbook (2017-2018) for more information on herbicides labeled for weed management in vegetables.

If cropping is not planned for the season immediately following the hurricane, use tillage or herbicide application to prevent weeds from going to seed and becoming a worse problem the next season. Also, repeat the control measures so that continual flushes of weeds emergence could be interrupted. Also, one important step in weed management after the hurricane and associated flooding is to note new weed species emergence.

Hurricane and flood waters could have washed in weed seeds currently not found in the affected fields. Check fields regularly to monitor new weed development, and make a field map of these weed locations and use the information towards planning next year's weed control program.

IRRIGATION MANAGEMENT

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For drip irrigated fields, irrigation can be resumed depending on how the irrigation pumps are powered. For farms relying on electricity, ability to start irrigation depends on damage to transmission lines and poles at the farm and/or the regional grid. For farms with combination of diesel and electricity powered pumps, combining the two systems can help resume the irrigation before the electric grid is repaired. Despite large rainfall inputs, sandy soils of south Florida can quickly become dry and require irrigation. A wide variety of soil moisture probes can be used to keep the soil moisture within the optium range to avoid the water stress. Growers who use dielectric soil moisture devices connected to dataloggers may not be able to use them after bedding given the time and efforts involved in installation and connecting them to dataloggers. Hand-held soil moisture measurement devices of sufficient accuracy are available and should be used to manage the irrigation duration and timings.

Depending on the location of the field and surrounding land uses, high water table conditions can prevail weeks after Hurricane. Such conditions require carefull management of irrigation to avoid prolonged wet conditions. Under high water table conditions, even a small rainfall can result in water table reaching the surface in the row-middles. Carefull drainage management is important to avoid prolonged wet conditions in the row middles.

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AGRICULTURAL ECONOMICS

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Loan programs from the USDA Farm Service Agency (FSA)
Purpose: provide vegetable growers with some basic information about FSA loans, which may help them, recover from H. Irma and other natural disasters.

Regular Operating Loans: Open to any producer who cannot obtain a loan from a bank or other commercial lender. These loans are NOT linked to any disaster losses. Loan amounts are limited to $300,000 and current interest rate is 2.75% (lower than the interest rate for an Emergency Loan). Repayment typically between 1 and 7 years, depending on the amount, collateral and borrower's repayment ability. One letter is needed from a bank which denied the grower's loan request.

Emergency Loans (EM): Production loans available up $500,000. Rates as of Sep 2017 are 3.75%. Some repayment terms as for Regular FSA

Loan. Borrower has to be denied credit from a bank or other commercial lender. If loan is for <$300,000, one denial letter is needed. If loan is >$300,000, two denial letters are needed.

To qualify for an EM Production loan, grower must show at least a 30% crop loss across his/her entire farming operation affected by the disaster. Losses are based on the farm's Actual Production History (APH) or at least the past 3 years of yield records. In the case of vegetable operations and "staggered plantings," one needs to consider the 30% farm loss threshold as over the entire operation, not just the specific area affected by the disaster. For example, a 100 ac tomato grower in south Florida averages 1,500 marketable cartons per acre for an annual total production of 150,000 cartons. This grower must show that his total production in the disaster year was less than 105,000 total cartons. This also means that if grower replants the damaged- affected area, any subsequent yield from the replanted area will count toward the farms total production.

If grower meets the loss threshold, then he can borrow up to 100% of the actual losses. Losses are calculated by multiplying the amount of yield loss (Avg ctn/ac – Actual ctn/ac) by the previous season's average monthly price as published in the NASS "Agricultural Price Report" (http://usda.mannlib.cornell.edu)

Example: The tomato grower described above planted 40 acres prior to H. Irma. The storm destroyed the 40 planted acres. The grower immediately replanted. The entire farm was harvested by the end of January 2018. Due to a number of complicating factors, the grower was only able to produce 250 ctn per acre from the 40 acres. Production on the remaining 60 acres was normal, or 1,500 ctns. Total production was 100,000 ctns (40ac x 250 ctn + 60ac x 1,500 ctn).

The grower lost more than 30% of his normal production, therefore is eligible for a FSA Emergency Loan He can get a loan equal to 100% of the loss, or 50,000 ctns x $9.6 1/ctn (2016 season average shipping point price for mature green tomatoes from south Florida). Source of price information https://usda.gov

The maximum loan amount will be $480.500, (just less than the $500,000 limit) @ 3.75% interest rate. If the grower receives a payout from a crop insurance policy, the loan amount will be reduced by the insurance payout.

Given the overall loan limits, these programs are not of much help to larger operations. If pre- harvest costs are $6,000 per acre, a $500,000 loan limit only affects 80 acres worth of production.

Emergency loans also are available to replace damaged physical property- buildings, equipment, and tree crops. In order to secure an emergency loan (EM) on damaged physical property, the grower must have had insurance coverage, and as with production loans. The amount of the EM will be net of any insurance payouts.

Acknowledgments to Mr. Justin Teuton, Farm Service Agency Loan Manager in Gainesville,Florida.
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