

FLORIDA DEPARTMENT OF AGRICULTURE  
AND CONSUMER SERVICES

*OFFICE OF AGRICULTURAL  
WATER POLICY*

1<sup>ST</sup> ANNUAL REPORT ON THE  
IMPLEMENTATION OF AGRICULTURAL  
BEST MANAGEMENT PRACTICES



*JULY 2008*



# 1<sup>ST</sup> ANNUAL REPORT ON THE IMPLEMENTATION OF AGRICULTURAL BMPs

*Prepared by*

FLORIDA DEPARTMENT OF AGRICULTURE  
AND CONSUMER SERVICES

*OFFICE OF AGRICULTURAL WATER POLICY*

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## EXECUTIVE SUMMARY

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Agricultural lands constitute about half of Florida's 35 million-acre land area. However, urban development is increasingly claiming significant agricultural acreage. Keeping land in agriculture has economic and environmental benefits, including: providing aquifer recharge, water storage, and flood attenuation, and contributing more than \$100 billion to Florida's economy.

Some agricultural activities may result in pollutant discharges (primarily nitrogen and phosphorus) to Florida's water resources. Florida Department of Agriculture and Consumer Services (FDACS) best management practices programs are a means for agricultural producers to reduce or avoid these potential impacts. Best management practices (BMPs) are cost-effective and practicable management actions for improving water quality and increasing water conservation. BMPs can be structural (e.g., fencing, stormwater ponds) or nonstructural (e.g., managing fertilization and irrigation rates).

FDACS has been developing and implementing BMP programs since the late 1970's, beginning with silviculture BMPs (through the Division of Forestry). Since then, FDACS also has adopted BMPs for aquaculture (through the Division of Aquaculture); and for citrus, container nurseries, vegetables and row crops, and other commodities (through the Office of Agricultural Water Policy). By 2010, all key commodities and specialty crops in the state should have FDACS-adopted BMP programs available for enrollment.

The importance of agricultural BMPs to the protection of Florida's water resources necessitates an ongoing program of follow up (implementation assurance) to ensure that BMPs are being implemented. The FDACS Division of Forestry, Division of Aquaculture, and Office of Agricultural Water Policy are in varying stages of conducting BMP follow-up efforts, to the extent that resources allow. This report focuses on the FDACS Office of Agricultural Water Policy Implementation Assurance Program.

### **OFFICE OF AGRICULTURAL WATER POLICY IMPLEMENTATION ASSURANCE**

The 1995 Florida Legislature established the Office of Agricultural Water Policy (OAWP) within FDACS. The OAWP develops, adopts, and assists in the implementation of BMPs for "traditional" agricultural commodities (those other than silviculture or aquaculture). Producers participate in OAWP best management practices programs by submitting a Notice of Intent (NOI) to implement the BMPs, which includes a checklist of practices applicable to the acres being enrolled. The OAWP developed a Best Management Practices Tracking System (BMPTS) to record the submittal of NOIs and assist in tracking BMP implementation.

The OAWP formally established a BMP implementation assurance program in 2005 in the Suwannee River Basin, as part of the multi-agency/local stakeholder Suwannee River Partnership. In 2007, OAWP initiated implementation assurance in the Lake Okeechobee Watershed, and launched a standardized follow-up program for the remaining areas of the state, beginning with the Ridge Citrus and Indian River Citrus BMPs. Because of program-specific needs, the follow-up process for each of these three components is somewhat different. As a whole, they make up the OAWP Implementation Assurance Program to date.

Highlights of the most recent findings and observations from these efforts are summarized below. Additional details are contained in the body of the report.

### ***SUWANNEE RIVER BASIN BMP IMPLEMENTATION***

Forty-seven of the 53 dairies in the basin (89%) have Conservation Plans. Six farms have chosen not to participate in formal BMP implementation at this time. Of the 47 dairies participating, 38 farms are fully implementing their plans (representing approximately 36,000 cows out of about 40,700). All 164 poultry farms in the basin are participating in BMP implementation, and 163 have fully implemented Conservation Plans.

In 2007, 30 dairy and 129 poultry operations received at least one site inspection, and some of those received additional visits. The total number of inspections was 55 for dairy and 188 for poultry. The percentage of *Satisfactory* ratings given during dairy inspections was: 78% for dairy collection and transport, 85% for manure storage, 85% for manure utilization, and 40% for record keeping. The percentage of *Satisfactory* ratings given during poultry inspections was: 100% for litter management, 98% for mortality management, and 56% for litter records. The ratings for record keeping may not accurately reflect the level at which this practice is conducted. This is because FDACS inspectors do not normally schedule their inspections, and if the producer is not available at the time of the visit to provide records for review, the inspector gives a rating of *Conditional Satisfactory* in this category.

Approximately 120,225 acres of crop farms are enrolled in BMPs under the FDACS manual *Water Quality/ Quantity BMPs for Vegetable and Agronomic Crops*. This represents more than 70% of the crop farm acreage in the basin. The OAWP will conduct a documented follow-up process for these operations as part of implementation assurance activities for vegetable and agronomic crops statewide.

### ***LAKE OKEECHOBEE WATERSHED BMP IMPLEMENTATION***

Between February 2007 and June 2008, OAWP staff inspected 57 cow-calf operations with completed Conservation Plans, which represent 100,500 of about 550,000 acres enrolled in the Lake Okeechobee Watershed program. Upon initial inspection, 38 (67%) of the operations inspected received a *Satisfactory* rating, and 19 received a rating of *Needs Improvement*. Each of the operations with a *Satisfactory* rating has received or will receive a follow-up visit. Reasons for this rating include incomplete implementation of BMPs and failure to secure the required soil test. Some producers cannot complete BMPs because of significantly increased costs. For example, the cost to install culverts has tripled since some producers signed up to implement the BMPs. With regard to soil testing, in most cases producers have since obtained or are obtaining the specified test.

### ***REMAINING AREAS OF THE STATE***

#### **Ridge Citrus BMP Implementation**

The Ridge Citrus program consists of a single, multifaceted BMP that focuses on the rate and timing of nitrogen (N) applications to citrus groves on Florida's sandy ridge soils. The BMP prescribes maximum N rates for single applications and for total annual

application, among other things. These maximums vary according to the following ages of the blocks of trees being fertilized: 1-3 years, 4-7 years, greater than 7 years.

In September 2007, OAWP mailed a written survey to 199 of the 214 contacts listed in its BMPTS for all operations that had submitted NOIs. The remaining 15 contacts were the largest-acreage producers, and were scheduled for onsite visits by OAWP staff to evaluate their implementation of the BMP, using the written survey. These 214 contacts represent a total of 107,215 enrolled acres.

As of May 2008, 133 survey responses had been received and twelve of the fifteen site visits completed. This provides a total of 145 responses out of the 214 contacts, with three site visits pending. Sixty-six producers did not respond, even after repeated attempts to contact them. These 66 are presumed to be inactive at present; however, OAWP staff will make an additional attempt to contact them before categorizing them "inactive" in the BMPTS. Most of the Ridge Citrus producers responding to the survey indicated they were implementing the BMP within the prescribed rates.

### ***One- to Three-Year Old Blocks***

Twenty-five Ridge Citrus survey responders indicated that they had some blocks of 1- to 3-year-old trees. Of these responders:

- One producer indicated that not all applications were within BMP rates. However, the operation's total annual N rate was below that prescribed in the BMP.
- One producer indicated that annual N application was greater than the allowable rate, but all individual applications were within the required rate. This may have resulted from too many individual applications within the calendar year. However, this producer requested and will receive additional help in implementing the BMP.

### ***Four- to Six-Year Old Blocks***

Twenty-eight producers indicated they had some blocks of 4- to 6-year-old trees. Of these producers, all 28 reported that their total average annual N rate was below 200 lbs/year. This part of the BMP is based on a four-year average, which includes the low N rates applicable to 1- to 3-year-old trees.

### ***Mature Production Blocks (7+ Years)***

Of the 145 producers responding to the survey, 123 indicated they had mature production blocks. Of these 123 producers, 120 reported their individual applications were within the BMP rate.

## **Indian River Citrus BMP Implementation**

The *Water Quality/Quantity BMPs for Indian River Area Citrus Groves* (Indian River Citrus BMPs) manual applies to the Indian River Lagoon, Lake Okeechobee, and St. Lucie River watersheds, which include the flat-woods citrus-producing regions of Volusia, Brevard, Indian River, Okeechobee, St. Lucie, Highlands, and Martin Counties. The BMPs address water management, sediment transport, pesticides, nutrients, and aquatic plants. Participating producers are required to implement the BMPs applicable to their operations. Applicable practices are those that address existing water quality and quantity issues and are technically and economically feasible to implement.

The Indian River Citrus BMP Survey addressed only the irrigation and nutrient management BMPs because these 27 practices are considered the key water quality BMPs in the manual, and a survey containing all 64 BMPs would have been excessively long. The other BMPs in the manual are regulated practices, and are subject to review and compliance checks by the responsible agencies.

In November 2007, ninety-three of the 98 producers listed in BMPTS were mailed a survey. The remaining 5 producers (with the most NOIs per producer) will receive site visits to complete the survey. Of the 93 mail-outs, 42 surveys were submitted, and four other producers responded by phone or mail that they were no longer in production. The other 46 producers did not respond after repeated attempts, and are presumed to be inactive at present. However, OAWP staff will make an additional attempt to contact these producers before categorizing them “inactive” in the BMPTS. The 98 contacts represent a total of 200,116 acres enrolled in the BMP program.

Based on the collective responses of the 42 producers who completed the survey, 91.23% of the 27 practices surveyed are being fully or partially implemented in their operations. The remaining BMPs were identified as not applicable or not technologically or economically feasible.

#### OVERALL BMP IMPLEMENTATION RATES BY PROGRAM

The BMP programs covered in this report each have their own unique characteristics and complexities, as do their related implementation assurance activities. It is risky to rely upon a snapshot of the outcomes of these programs because of the varying methods of evaluation used. The figures in **Table 1** provide a conservative estimate of the overall rate of implementation for each program, based on survey and/or site inspection results. An explanation of how each percentage was calculated is contained in **Appendix 8**. These figures must be considered in the context of the detailed results and discussion presented in this report.

TABLE 1. OVERALL BMP IMPLEMENTATION RATES BY PROGRAM*			
SUWANNEE RIVER	LAKE OKEECHOBEE	RIDGE CITRUS	INDIAN RIVER CITRUS
<i>Dairy:</i> 72%	67%	94%	88%**
<i>Poultry:</i> 85%			

\* See **Appendix 8** for an explanation of how overall percentages were calculated.

\*\* This is a more conservative estimate than described above.

#### OBSERVATIONS AND FUTURE STEPS

##### GENERAL OBSERVATIONS

The implementation assurance process completes the loop that begins with BMP development, and the feedback from this process potentially affects all stages of OAWP programs. Below is a summary of observations made during BMP follow up activities, and key steps that OAWP will take to address observed issues and needs. The body of the report contains more in-depth discussion.

1. Some of the older BMPs and manuals (e.g., Ridge Citrus and Indian River Citrus) may need to be revised to update and clarify the BMPs, to ensure that producers understand and can effectively implement them.

**Future Steps:**

- Continue to refine the development of new BMP manuals to make them as effective and useful to producers as possible.
  - Review existing manuals for necessary revision and clarification.
  - Working with the citrus industry, possibly consolidate the four citrus BMP programs into a statewide manual, specifying regional differences as needed.
2. Producer perception of BMP programs and attitudes toward government affect their enrollment in BMPs and participation in follow up efforts.

**Future Steps:**

- Explore the benefit of conducting targeted surveys on producer perceptions and attitudes about BMPs.
3. Producer understanding of individual BMPs is not always adequate to result in proper implementation. Record keeping is a potential area of weakness.

**Future Steps:**

- Continue to emphasize the importance of BMPs, with particular attention to record keeping.
  - Explore the use of association newsletters as a BMP communication/education tool.
  - Ensure that the enrollment process provides adequate assistance to producers to select and understand applicable BMPs; ensure that follow-up contact is made within 90 days of enrollment.
4. Continual shifts in agricultural production and BMP participation affect OAWP's ability to accurately track and report on BMP enrollment and implementation.

**Future Steps:**

- Use information gathered from the implementation assurance process to update BMP tracking data.
  - Develop mechanisms for getting updated contact and enrollment information on a regular basis, such as outreach through association newsletters and periodic mail-out requests.
5. How survey instruments are constructed and worded affects the willingness of producers to participate and the quality of feedback.

**Future Steps:**

- Continue to refine survey questions, incorporating guidance from Dr. Dillman's Mail and Internet Surveys: *The Tailored Design Method, 2<sup>nd</sup> Edition (2007)*.
6. Site visits are integral to implementation assurance, but agency resources do not allow for site visits on all enrolled agricultural operations statewide.

**Future Steps:**

- Complete survey-based site visits for the Ridge and Indian River Citrus programs.

- Develop and implement a protocol for post-survey site visits in other areas of the state, addressing site selection and the documentation and ranking of BMP implementation.
  - Continue to conduct site visits in the Suwannee River Basin and Lake Okeechobee Watershed.
  - Modify site inspection forms as needed to increase clarity and ease of use.
7. OAWP implementation assurance efforts and results have been documented differently for different regions/programs. While this may be appropriate to address regional circumstances, procedures should be standardized as much as possible. In addition, an integrated database to track BMP implementation statewide is needed.

**Future Steps:**

- Review region-specific implementation assurance procedures, and standardize them to the extent practicable.
- OAWP staff will develop a single database to track implementation assurance evaluations and results statewide.

**PROGRAM-SPECIFIC OBSERVATIONS**

**Suwannee River Basin**

While agricultural BMP implementation is strong in this basin, several animal operations are still not participating. There is also a significant amount of vegetable/row crop acreage that is not yet enrolled in the related FDACS statewide BMP manual. BMP Implementation Assurance (“Quality Assurance” in this basin) site inspections in the Suwannee River Basin reveal that compliance ratings are high, but record keeping is a potential weakness.

**Future Steps:** In support of SRP objectives related to agricultural BMP implementation OAWP and SRP staff will work to:

- Implement all BMP programs applicable within the Suwannee River Water Management District to the greatest extent practicable, targeting increased participation in the Water Quality/Quantity BMPs for Vegetables and Agronomic Crops. Staff will also work with producers to update existing plans, where needed.
- Address any procedural weaknesses in the implementation assurance process.
- Continue to conduct and follow up on implementation assurance site inspections for animal operations, at least once a year.
- Conduct implementation assurance for vegetable and row crop producers via statewide survey and targeted site visits.
- Effectively promote:
  - ✓ Operation and maintenance of BMPs
  - ✓ BMP record keeping
  - ✓ Irrigation water management
- Provide tools for Extension Agents to use in education and outreach.

### **Lake Okeechobee Watershed**

Key issues with regard to BMP implementation in the Lake Okeechobee Watershed are completing applicable BMPs and obtaining the required type of soil test.

**Future Steps:** OAWP staff will:

- Continue to visit each operation enrolled in the Lake Okeechobee Watershed Program. Approximately 75 sites are targeted for inspection between June 2008 and May 2009.
- Emphasize the necessity of record keeping, and assist producers in developing record-keeping systems, as needed.
- Amend the Lake Okeechobee Rule (5M-3, F.A.C.) to incorporate the entire NEEP area and make appropriate revisions pursuant to the 2007 legislation. Changes to the rule may include expanding the types of soil tests producers can submit to comply with the BMPs.

### **Ridge Citrus**

Though potential Ridge Citrus acres have decreased since 2002, due to economic and other forces, there are a significant number of operations still in production that have not enrolled in the BMP program. The complexity of the Ridge Citrus BMP can make adherence difficult under site-specific circumstances.

**Future Steps:**

- The OAWP has contracted with UF/IFAS to (among other things) reinvigorate efforts in fiscal year 2008-09 to enroll citrus producers, with particular emphasis on Ridge Citrus producers, through BMP implementation team support.
- To assist growers in understanding and implementing the BMP OAWP staff will explore :
  - ✓ Conducting educational workshops and develop materials on implementation of the BMP, with initial emphasis on *Wet Season* application rates.
  - ✓ Possibly modifying the BMP to make it more similar to other citrus BMPs, allowing flexibility in how to accomplish the intended result under varying circumstances.

### **Indian River Citrus**

The IRC survey revealed some shortcomings in the BMP manual and in the questions on the survey.

**Future Steps:**

As discussed under *General Observations*, OAWP staff will:

- Review existing BMP manuals for possible updating and clarification of practices.
- Working with the citrus industry, explore the possibility of consolidating existing citrus BMP programs into a single, statewide manual.
- Continue to refine survey questions to ensure the quality of feedback.

## ACRONYMS

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<b>BMAP</b>	Basin Management Action Plan
<b>BMP</b>	Best Management Practice
<b>BMPTS</b>	Best Management Practices Tracking System
<b>CPS</b>	Conservation Practice Standard
<b>DOF</b>	Division of Forestry
<b>EDIS</b>	Electronic Data Information Service
<b>FDACS</b>	Florida Department of Agriculture and Consumer Services
<b>FDEP</b>	Florida Department of Environmental Protection
<b>FWRA</b>	Florida Watershed Restoration Act
<b>GIS</b>	Geographic Information Systems
<b>GPS</b>	Global Positioning System
<b>IRC</b>	Indian River Citrus
<b>LOPA</b>	Lake Okeechobee Protection Act
<b>LOPP</b>	Lake Okeechobee Protection Plan
<b>LSJR</b>	Lower St. Johns River
<b>NEEPP</b>	Northern Everglades and Estuaries Protection Program
<b>NOI</b>	Notice of Intent (to implement BMPs)
<b>NRCS</b>	Natural Resources Conservation Service
<b>OAWP</b>	Office of Agricultural Water Policy (within FDACS)
<b>O &amp; M</b>	Operation and Maintenance
<b>RMS</b>	Resource Management System
<b>SFWMD</b>	South Florida Water Management District
<b>SRWMD</b>	Suwannee River Water Management District
<b>SRP</b>	Suwannee River Partnership
<b>SWCD</b>	Soil and Water Conservation District
<b>TCAA</b>	Tri-County Agricultural Area (within the St. Johns River WMD)
<b>TMDL</b>	Total Maximum Daily Load
<b>UF/IFAS</b>	University of Florida/Institute of Food and Agricultural Sciences
<b>USDA</b>	United States Department of Agriculture
<b>WMD</b>	Water Management District

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## INTRODUCTION

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### **AGRICULTURE IN FLORIDA**

Agricultural lands constitute about half of Florida's 35 million-acre land area. Farms and ranches may contain agricultural production lands, pasture areas, and/or open lands, which comprise essentially natural vegetative cover. The majority of lands classified as agriculture, silviculture, or unimproved pasture are managed in a natural or semi-natural condition. Only about 10 percent of agricultural lands in Florida require irrigation.

Keeping land in agriculture has the following economic and environmental benefits:

- Agriculture plays a key role in Florida's economy. A recent study by the University of Florida/Institute of Food and Agricultural Sciences (*Economic Contributions of Agricultural, Food Manufacturing, and Natural Resource Industries in Florida in 2006*) shows that Florida agriculture, natural resource, and related industries have a \$101.9 billion value-added impact, and generate the second largest number of jobs in the state.
- Agricultural lands provide critical recharge areas in Florida. For the most part, they contain minimal areas of impervious surface, maintain wetlands in their natural condition, and do not have dense vegetative cover. Consequently, water is not rapidly drained away, and has time to seep into the regional aquifer system.
- During periods of abnormally high rainfall, agricultural lands can hold flood waters for longer periods than urban areas. This helps protect nearby urban areas from flooding and also helps maintain recharge rates.
- Some agricultural producers also store surplus water to use during dry periods, which under drought conditions helps minimize impacts to public water supply.

Some agricultural activities may result in pollutant discharges (primarily nitrogen and phosphorus) to Florida's water resources. Florida Department of Agriculture and Consumer Services (FDACS) best management practices programs are a means for agricultural producers to reduce or avoid these potential impacts.

### **AGRICULTURAL BEST MANAGEMENT PRACTICES**

Best management practices (BMPs) are individual or combined practices determined through research, field testing, and expert review to be the most effective and practicable means for improving water quality, taking into account economic and technological considerations. BMPs may be developed for both urban and agricultural pollutant sources.

Two key categories of BMPs are nutrient management and irrigation management. Nutrient management addresses the type, amount, timing, and placement of fertilizer. Reduced fertilizer application rates, soil and tissue tests, fertigation (fertilizing through irrigation), split fertilizer applications, foliar applications, controlled-release fertilizer, fertilizer spreader shut-off valves, and variable-rate fertilizer spreaders are among the nutrient management BMPs. Irrigation management involves the maintenance,

scheduling, and overall efficiency of irrigation systems. It typically includes conversion to low-volume systems; soil moisture monitoring; scheduling according to rainfall, temperature, and other climatic conditions; water placement; and plant groupings.

### ***FDACS OFFICE OF AGRICULTURAL WATER POLICY***

Recognizing the need for comprehensive policy development and coordination on water resource issues related to the many sectors of traditional Florida agriculture, the 1995 Florida Legislature established the Office of Agricultural Water Policy (OAWP) within FDACS. The OAWP facilitates communication and coordination among federal, state, and local agencies, environmental representatives, and the agriculture industry on agricultural water resource issues. The OAWP also develops, adopts, and assists in the implementation of agricultural best management practices.

### **AGRICULTURAL BMPs AND TOTAL MAXIMUM DAILY LOADS**

A Total Maximum Daily Load (TMDL) establishes the maximum amount of a given pollutant that a water body can absorb without exceeding applicable water quality standards. Under section 303(d) of the Federal Clean Water Act and section 403.067, Florida Statutes (the Florida Watershed Restoration Act), TMDLs must be developed for all waters identified as “impaired” (exceeding water quality standards). A water body may have several TMDLs, one for each targeted pollutant. Pollutants for which TMDLs have been set include total phosphorus, total nitrogen, iron, and fecal coliform bacteria, among others.

The Florida Department of Environmental Protection (FDEP) identifies impaired waters and develops and adopts TMDLs through a watershed management approach (managing water resources within their natural boundaries) based on the state’s major hydrologic basins. FDEP is authorized by statute to develop basin management action plans in coordination with affected interests, to achieve the TMDLs set for specific water bodies.

### ***RELATIONSHIP OF AGRICULTURAL BMPs TO TMDLs***

Under the Florida Watershed Restoration Act (FWRA), agricultural nonpoint pollutant sources included in a TMDL basin management action plan (BMAP) must either implement FDACS-adopted BMPs, or conduct water-quality monitoring prescribed by FDEP or the applicable water management district, to demonstrate compliance with pollutant reductions established in the TMDL. Otherwise, these sources may be subject to enforcement by FDEP or the applicable water management district (WMD). Ongoing implementation and maintenance of BMPs that FDEP has verified as effective and FDACS has adopted by rule provides a presumption of compliance with state water quality standards.

The need for and benefit of agricultural BMP programs has escalated significantly since the passage of the FWRA in 1999. The number of impaired water bodies and associated TMDLs grows each year, as DEP incrementally assesses waters from a planning list of more than 700 segments. FDACS-adopted BMPs are a cost-effective and recognized means through which agricultural producers can comply with TMDLs and help meet other state and federal water resource objectives.

## FDACS-ADOPTED BMP PROGRAMS

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### FDACS BEST MANAGEMENT PRACTICES PROGRAMS

#### ***SILVICULTURE BMPs***

BMPs for silviculture in Florida were first established in the late 1970s in response to the federal Clean Water Act of 1972, to address potential pollutant runoff from forestry activities. Effective February 11, 2004, the FDACS Division of Forestry formally adopted the silviculture BMP Manual in Chapter 5I-6, Florida Administrative Code (F.A.C.). The rule provides for a Notice of Intent (NOI) to be submitted by landowners who elect to participate in the program.

Florida silviculture BMPs have been shown to be effective in protecting water quality and aquatic habitat by minimizing or eliminating the delivery of forestry-related sediment, nutrients, and other pollutants, and by maintaining or improving both in-stream and riparian habitats. BMP effectiveness research conducted in Florida, on a variety of sites and under varying site conditions, reported no evidence of sediment delivery or other impacts to the aquatic ecosystem following intensive silviculture operations that use BMPs. For more information on silviculture BMPs, visit: <http://www.fl-dof.com> .

#### ***AQUACULTURE BMPs***

Effective July 1, 1998, the Florida Legislature adopted a program of aquaculture BMPs to assure that aquaculture farms do not negatively affect the environment (section 597.004, Florida Statutes), and has designated FDACS as the primary agency for regulating aquaculture. Any person who engages in aquaculture must obtain an aquaculture certificate of registration annually from FDACS, and follow all applicable aquaculture BMPs pursuant to Chapter 5L-3, F.A.C. The FDACS Division of Aquaculture is responsible for this BMP program. For more information on aquaculture BMPs visit: <http://www.floridaaquaculture.com> .

#### ***BMPs FOR TRADITIONAL AGRICULTURAL OPERATIONS***

##### **Office of Agricultural Water Policy BMP Development**

As directed by state statutes (sections 403.067, 570.085, Florida Statutes, and others) FDACS, through OAWP, works cooperatively with agricultural producers and industry groups, environmental representatives, the Florida Department of Environmental Protection (FDEP), the water management districts, the university system, and other interested parties to develop and implement non-regulatory agricultural BMP programs that are economically and technologically feasible. These programs address both water quality and water quantity on a site-specific, regional, and watershed basis, and target most traditional agricultural commodities.

FDACS BMP rules, adopted manuals, and staff contact information are located at <http://www.floridaagwaterpolicy.com> . **Table 2** shows the BMP measures and manuals FDACS has adopted to date, and those under development.

**TABLE 2. FDACS AGRICULTURAL BEST MANAGEMENT PRACTICES PROGRAMS**

OAWP BMP INITIATIVES	RULE	AREA(S) OF APPLICATION	MANUAL/ RULE STATUS
<i>Forage Grass</i>	5E-1	Within SRWMD boundaries	Adopted – to be revised
<i>Ridge Citrus</i>	5E-1	Lake Wales Citrus Ridge Area	Adopted
<i>Leatherleaf Fern</i>	5E-1	In and around Volusia County	Adopted – to be revised
<i>Indian River Area Citrus</i>	5M-2	All or part of Volusia, Brevard, Indian River, St. Lucie, Martin, Okeechobee, Palm Beach	Adopted
<i>Lake Okeechobee Watershed</i>	5M-3	Lake Okeechobee watershed	Adopted
<i>Tri-county Ag Area (TCAA)</i>	5M-4	St. Johns, Flagler, Putnam counties	TCAA now covered by statewide vegetable manual
<i>Citrus Groves in Peace River- Manasota Basin</i>	5M-5	All or part of Manatee, Sarasota, Hardee, DeSoto and Charlotte counties	Adopted
<i>Gulf Citrus</i>	5M-7	All or part of Hendry, Glades, Lee, Collier and Charlotte	Adopted
<i>Vegetable and Agronomic Crops</i>	5M-8	Statewide applicability	Adopted
<i>Container Nurseries</i>	5M-6	Statewide applicability	Adopted
<i>Sod Farm</i>	5M-9	Statewide applicability	Targeted for adoption 9/08
<i>Cow/Calf Operations</i>	TBD	Statewide applicability	Targeted for adoption 1/09
<i>Equine/Horse Farm</i>	TBD	Statewide - concentrated facilities	Targeted for adoption Spring 2009
<i>Conservation Plan Rule</i>	TBD	Statewide applicability	Under development
<i>Water Conservation</i>	TBD	Irrigated agriculture statewide	Not Adopted – to be revised
OTHER FDACS BMP INITIATIVES	RULE	AREA(S) OF APPLICATION	MANUAL/ RULE STATUS
<i>Silviculture</i>	5I-6	Statewide applicability	Adopted/Div. of Forestry
<i>Aquaculture</i>	5L-3	Statewide applicability	Adopted/Div. of Aquaculture

### Enrollment in OAWP BMP Programs

Agricultural producers can enroll in FDACS/OAWP BMP programs by submitting a Notice of Intent (NOI) to implement BMPs, which is included in the adopted BMP manuals. The manuals and NOIs can be obtained from the OAWP website, or from county extension offices. OAWP contracts with the University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS) and other providers to recruit producers and assist them in enrolling. In most cases, the producer fills out a BMP checklist with the help of an implementation team member, selecting the BMPs applicable to the operation.

### BMP Implementation Assistance

The OAWP also assists agricultural producers in funding and implementing BMPs for commodities other than silviculture or aquaculture. It employs field staff and contracts with service providers to work with producers to understand and implement the BMPs selected on their NOIs. Depending on the region of the state, service providers include the soil and water conservation districts, UF/IFAS, and resource development and conservation councils. They give technical assistance to producers and help conduct BMP cost-share programs. The OAWP also helps provide educational workshops and other opportunities for farmers to learn about BMPs. FDACS/OAWP-funded Mobile Irrigation Labs identify and demonstrate irrigation efficiency techniques to growers.

## **BMP IMPLEMENTATION ASSURANCE – APPROACHES**

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### **SILVICULTURE AND AQUACULTURE BMP IMPLEMENTATION FOLLOW-UP ACTIVITIES**

#### ***SILVICULTURE***

Compliance with silviculture BMPs has been monitored statewide since 1981 through random field surveys. Forestry is a low-intensity activity, and does not require the daily attention other agricultural operations do. Consequently, it is not possible to enroll all of the landowners in the BMP program because they often are not physically available. However, most, if not all, landowners implement BMPs without submitting an NOI, and compliance monitoring includes operations that have not submitted NOIs. Field survey results are assumed to reflect the level of BMP implementation on all silviculture operations, including those that were not surveyed in a given year. The 2007 *Silviculture Best Management Practices Implementation Survey Report* is located at: [http://www.fl-dof.com/forest\\_management/fm\\_pdfs/2007\\_bmp\\_survey.pdf](http://www.fl-dof.com/forest_management/fm_pdfs/2007_bmp_survey.pdf) .

#### ***AQUACULTURE***

The Division of Aquaculture visits each certified aquaculture facility at least two times a year to assist in compliance with required BMPs. Certified aquaculturists who comply with the BMPs are presumed to be in compliance with state ground water and surface water standards, and with regulations for the culture of non-native species. Chapter 5L-3, F.A.C., requires that FDACS take action to assure proper BMP implementation and compliance under section 597.0041, Florida Statutes (F.S.).

Any person who violates any provision of Chapter 597, F.S., or Rule 5L-3, F.A.C., commits a first-degree misdemeanor, and is subject to a suspension or revocation of the certificate of registration. FDACS may also impose an administrative fine of up to \$1,000 per violation per day. The rule provides a schedule of actions and penalties based on occurrence of violations. In addition, a producer who fails or refuses to implement the BMPs must obtain all necessary permits/authorizations required by FDEP, the applicable water management district, the Florida Fish and Wildlife Conservation Commission, and any other appropriate regulatory authority.

#### **OFFICE OF AGRICULTURAL WATER POLICY BMP IMPLEMENTATION ASSURANCE**

The OAWP began its BMP follow-up effort in the Suwannee River Basin, expanded it to the Lake Okeechobee Watershed, and has now initiated implementation assurance activities statewide on a rotating basis. Collecting data on BMP enrollment and implementation helps OAWP to:

- ✓ Provide accountability and demonstrate the level of producer adherence to BMPs.
- ✓ Identify needs for additional education and implementation assistance for producers.
- ✓ Communicate the importance of BMP implementation to producers
- ✓ Measure the success of BMP programs – This is particularly important to help maintain legislative, agency, and public support for this incentive-based approach to reducing agricultural impacts to water resources.
- ✓ Keep NOI records up to date, so OAWP can more accurately report program enrollment rates and provide producers with program updates and information.

One challenge to tracking BMP implementation is the continual shift in crop commodities and land uses. In some parts of the state, agriculture is giving way to urban/suburban development. The increasing cost of running an agricultural operation leads many producers to sell all or part of their land at prices that exceed production value. These changes in land use are not routinely reported to OAWP by producers, or readily discovered. Through BMP implementation follow-up activities, OAWP is attempting to update its records as much as possible, to provide reasonably accurate information on producers and acres enrolled in its BMP programs.

Office of Agricultural Water Policy BMP enrollment tracking and implementation assurance processes are described below. The results of implementation assurance activities are discussed in the section, *BMP Implementation Assurance - OAWP Program Results*.

#### ***TRACKING BMP ENROLLMENT IN OAWP PROGRAMS***

The OAWP developed a BMP Tracking System (BMPTS) to record the submittal of NOIs under its programs and assist in tracking BMP implementation. The BMPTS can be queried to provide reports on the number of NOIs submitted, location of enrolled operations by county, associated acres by county, and other non-confidential information. The OAWP has also begun mapping acres enrolled, to give a general picture of BMP coverage around the state. The success of the mapping effort varies by region, depending on the availability and accuracy of GIS data.

#### ***SUWANNEE RIVER BASIN BMP IMPLEMENTATION ASSURANCE PROCESS***

The Suwannee River Basin is a priority area for FDACS, the Suwannee River Water Management District, FDEP, local governments, and others, who developed an agreement in 1999 to work together as the Suwannee River Partnership (SRP). The mission of the SRP is to *assess sources of nutrient loadings to the Suwannee River Basin and optimize reductions in loadings to waters of the basin, emphasizing voluntary, incentive-based programs for protecting the environment and public health*. This mission statement currently is being revised to reflect the broadened activities of the SRP. SRP goals include achieving 80 -100 percent farmer participation in BMP implementation, operation, and maintenance, through the use of NRCS Conservation Plans and/or FDACS-adopted BMP manuals. Targeted operations are dairies, poultry operations, and vegetable and row crop farms.

In 2005, OAWP, as part of the Partnership, participated in establishing the first formal process for BMP implementation assurance (also referred to in this basin as “quality assurance”) in the Suwannee River Basin, with the initial focus on dairy and poultry operations. The FDACS Dairy and Animal Industry divisions were asked to help conduct implementation assurance through their normal inspection programs. The process for BMP implementation assurance in the Suwannee River Basin is summarized below.

### ***SUWANNEE RIVER BASIN IMPLEMENTATION ASSURANCE PROCESS***

#### **Dairy and Poultry Farms**

Annually, FDACS inspectors from the Dairy and Animal Industry divisions visit dairy and poultry farms participating in the Suwannee River Partnership, to ensure that BMPs are maintained.

The inspectors fill out evaluation forms and assign a rating of *Satisfactory*, *Conditional Satisfactory*, or *Unsatisfactory* (See **Appendix 1**).

- For a *Satisfactory* rating: no further action is required, other than regular inspections.
- For a *Conditional Satisfactory* rating the following steps are taken, as needed:
  - Within 30 days of inspection: Technician visit
  - Within 60 days of inspection: If issues not resolved after first Technician visit another visit is conducted
  - Within 90 days of inspection: If issues not resolved after second Technician visit, FDACS staff visit is conducted
  - Within 120 days of inspection: If issues not resolved after FDACS staff visit, FDEP staff visit is conducted
- For an *Unsatisfactory* rating the following steps are taken, as needed:
  - Within 7 days of inspection: Technician visit
  - Within 37 days of inspection: If issues not resolved after first Technician visit another visit is conducted
  - Within 67 days of inspection: If issues not resolved after second Technician visit, FDACS staff visit is conducted
  - Within 90 days of inspection: If issues not resolved after FDACS staff visit, FDEP staff visit is conducted

The BMPs commonly reviewed during dairy and poultry site inspections are:

#### ***Structural BMPs Reviewed***

- Dairy
  - Barns or structures that collect manure
  - Pipes or structures that transport manure
  - Manure storage facilities
  - Irrigation systems and other mechanisms for applying manure to crops
- Poultry
  - Litter Storage Barns
  - Dead Bird Composters
  - Litter Application Equipment

#### ***Management BMPs Reviewed (Dairy and Poultry)***

- Proper operation and management of structures
- Manure/nutrient application rates
- Soil and manure testing
- Record keeping

#### **Vegetable and Row Crop Operations**

SRP staff and technicians visit vegetable and row crop operations that receive cost-share funds, to ensure that they are keeping fertilization and irrigation records, which is a cost-share requirement. The OAWP will conduct a follow-up process for these operations as part of implementation assurance activities for vegetable and agronomic crops statewide.

**LAKE OKEECHOBEE WATERSHED BMP IMPLEMENTATION ASSURANCE PROCESS**

The Northern Everglades and Estuaries Protection Program (NEEPP), section 373.4595, F.S., mandates the implementation of FDACS-adopted BMPs verified by FDEP as effective, on all lands within the Lake Okeechobee watershed. Producers who do not implement BMPs must conduct water quality monitoring prescribed by FDEP or the South Florida Water Management District (SFWMD), in order to demonstrate compliance with the SFWMD's Works of the District program. Ongoing implementation and maintenance of the BMPs affords a presumption of compliance with state water quality standards for the pollutants the BMPs address.

FDACS is responsible for working with agricultural landowners to implement phosphorus-load-reducing BMPs on farms and ranch lands in the Lake Okeechobee Watershed. Because of the statutory priority given to this area, and the resources invested, it was OAWP's next focus for implementation assurance (also referred to in this basin as "quality assurance").

The OAWP has a dedicated a staff person to visit the operations within the basin that have submitted an NOI. To date, these have been the cow-calf operations that have implemented Conservation Plans. However, dairy, nursery, citrus, and other agricultural commodities will also receive formal site inspections. The overall approach to implementation assurance in the watershed is summarized below.

**LAKE OKEECHOBEE WATERSHED IMPLEMENTATION ASSURANCE PROCESS**

- Each operation is visited upon completion of cost-share structural BMPs, to ensure these BMPs have been properly installed, prior to receiving state cost-share funds.
- Overall Implementation Assurance site inspections are conducted generally in order of when Conservation Plans are completed and implemented, within 6 months of plan implementation.
- Staff fills out a review/checklist form and assigns an overall rating of *Satisfactory*, *Needs Improvement*, or *Unsatisfactory* (See **Appendix 2**)
- For operations that receive a *Satisfactory* rating, no follow-up visit is necessary. However, OAWP staff will conduct "routine" site visits approximately annually, depending on the inspection workload. At this time, maintenance of structural BMPs will be reviewed and rated.
- For a rating of *Unsatisfactory* or *Needs Improvement*, there will be a scheduled follow-up inspection, usually within 120 days to check on progress.
- Additional follow-up site visits will be scheduled as circumstances warrant.
- Producers who repeatedly decline to implement BMPs are referred to the SFWMD for follow up regarding the required monitoring, at which time the SFWMD may require a Works of the District permit that incorporates the monitoring requirement.

The BMPs commonly reviewed during site inspections are:

**Structural BMPs**

- ✓ Culverts
- ✓ Culvert risers
- ✓ Fences
- ✓ Water troughs/ well capping

**Management BMPs**

- ✓ Nutrient management
- ✓ Maintenance of structural BMPs
- ✓ Record keeping

**OAWP BMP IMPLEMENTATION ASSURANCE PROCESS FOR OTHER AREAS OF THE STATE**

With BMP follow-up programs established in the Suwannee River Basin and Lake Okeechobee Watershed, OAWP initiated a process in 2007 to conduct implementation assurance activities in the remainder of the state. Because the four citrus BMP programs were the first adopted by OAWP, follow up outside of the Suwannee and Okeechobee areas began with this commodity. The first two programs addressed, and reported on in this document, were Ridge Citrus and Indian River Citrus. The Peace River Citrus and Gulf Citrus BMP programs are scheduled next.

Due to the large workload involved in conducting BMP follow up statewide, and the need to collect as much information as possible, OAWP staff developed a standardized approach, which can be modified as needed for different commodities or regions of the state. This approach is summarized below, and a related flowchart is contained in **Appendix 3**.

**IMPLEMENTATION ASSURANCE PROCESS FOR OTHER AREAS OF THE STATE**

- For each program/commodity, identify the BMPs that will be the focus of implementation assurance activities, primarily irrigation and nutrient management BMPs.
- Distribute surveys to all property owners/leaseholders who have submitted NOIs (after culling out duplicate NOIs and NOIs for operations known to be no longer in business or participating in BMPs).
  - Use mail-out survey distribution. Explore the possibility of online access to surveys for future use.
  - Stagger distribution by programs.
  - Conduct follow-up to non-responders (allow 3 to 4-week response time after initial distribution, then re-send survey, make phone calls, etc., as appropriate).
- Generally use site visits as spot checks/quality control to support the survey process, observe practices, check records, gather information on education and technical assistance needs, stay in touch with growers and their circumstances, etc.
  - Conduct site visits up front where a large number of NOIs have been submitted for a single operation (NOI threshold varies for each program).
  - Select number and location of sites for post-survey visits based on a combination of factors, which may include, but are not limited to:
    - Survey responses
    - Proximity to priority water bodies (legislative or agency designations)
    - Existence of TMDLs/basin management action plans (BMAPs) within the survey area
    - Number of acres covered by NOIs
- For post-survey site visits, rank BMP implementation as *Satisfactory*, *Conditional Satisfactory*, or *Unsatisfactory*.
- OAWP staff or contractors conduct individualized follow up to sites not satisfactorily implementing BMPs, with resources targeted to priority areas (such as basins with adopted BMAPs.)
- In the case of continuous non-cooperation by an agricultural producer in implementing BMPs in a basin with an adopted BMAP, OAWP will consult with FDEP and the applicable water management district to determine whether it is necessary for one of those agencies to intervene under their statutory authority.

The OAWP explored the possibility of conducting enough site visits to provide a statistically valid sample of enrollees under each specific BMP program/manual. This would allow general conclusions to be drawn about BMP implementation for each program population. The number of site visits needed to do this for each program was impractical. For example, in the Ridge Citrus BMP program, the population size of 214 contacts would require 138 site visits. In the Indian River Citrus BMP program, the population size of 99 contacts would require 79 site visits. Staff determined that similar numbers of responses to a written survey would allow statistically valid generalizations about BMP implementation. A reasonable number of follow-up site visits would provide spot checks to confirm survey results and give assistance to growers who most need it.

In developing a survey instrument that would (with reasonable accuracy) reflect the current practices of producers participating in OAWP BMP programs, staff leaned heavily upon the methodology developed by Dr. Don A. Dillman, consulting a number of his publications, including: *Mail and Telephone Surveys: The Total Design Method* (1978), which provides detailed procedures for conducting effective mail- or telephone-based surveys; and *The Design and Administration of Mail Surveys* (1991), which addresses mixed media surveys and improving response rates.

The planned timeline for statewide implementation assurance activities, shown in **Table 3**, is based on the length of time each BMP program has been in effect. This schedule may be modified to reflect various priorities. For instance, as FDEP establishes TMDLs and develops associated BMAPs, the dominant agricultural land use(s) within the BMAP area may receive expedited attention, if necessary.

**TABLE 3. APPROXIMATE TIMELINE FOR OAWP IMPLEMENTATION ASSURANCE FOR AREAS OF THE STATE OUTSIDE THE SUWANNEE AND OKEECHOBEE BASINS**

BMP Implementation Assurance Activities	Timeline
<b>Ridge Citrus BMP</b>	Survey Distribution and Follow Up: 9/2007 - 1/2008 Site Visits: <ul style="list-style-type: none"> <li>• Up front visits: 12 completed; 3 pending (8/08)</li> <li>• Post-survey site visits: 8/08 - 12/08</li> </ul>
<b>Indian River Citrus BMPs</b>	Survey Distribution and Follow Up: 11/2007 - 4/2007 Site Visits: <ul style="list-style-type: none"> <li>• Survey site visits: 5 pending (8/08)</li> <li>• Post-survey site visits: 8/08 - 12/08</li> </ul>
<b>2007/08 Annual Report</b>	July 2008
<b>Peace River Citrus BMPs</b>	Fall/Winter 2008
<b>Gulf Citrus BMPs</b>	Fall/Winter 2008
<b>2008/09 Annual Report</b>	July 2009
<b>Statewide Vegetable/Agronomic Crop BMPs - Special focus on the Tri-County Agricultural Area within the LSJR Basin</b>	Summer/Fall 2009
<b>Statewide Container Nursery BMPs</b>	Spring/Summer 2010
<b>Statewide Sod BMPs (manual to be adopted)</b>	Within 3 years of manual adoption
<b>2009/10 Annual Report</b>	July 2010
<b>Statewide Cow/Calf BMPs (manual to be adopted)</b>	TBD, based on submission of NOIs
<b>Statewide Equine BMPs (manual to be adopted)</b>	Within 3 years of manual adoption

The three implementation assurance processes described above vary according to program requirements and available resources. However, they contain common elements, and together comprise OAWP's effort to date to collect and evaluate information on BMP implementation statewide. **Table 4** provides an overview of the components of the OAWP implementation assurance program.

**TABLE 4. OVERVIEW OF OAWP BMP IMPLEMENTATION ASSURANCE PROGRAM**

PROGRAMMATIC COMPONENTS	GEOGRAPHIC COMPONENTS		
	SUWANNEE BASIN	LAKE OKEECHOBEE WATERSHED	STATEWIDE PROGRAMS
	Initiated: 2005	Initiated: 2007	Initiated: 2007
<b>Areas/Commodities Addressed to Date</b>	Dairies and poultry operations (formal process); vegetable and row crop farms (in part)	Cow-Calf Operations (some with multiple commodities)	Ridge Citrus Indian River Citrus
<b>Mail-out Surveys</b>	None	None	To all enrollees by program/commodity
<b>Site Visit Process</b>	FDACS Inspectors visit farms at least once a year	OAWP staff visits ranches/farms with implemented plans	OAWP Staff visits selected sites
<b>Site Visit Selection</b>	All participating farms	All ranches/farms with Conservation Plans	As part of written survey, operations with large # of NOIs. Post-survey visits to selected sites
<b>Evaluation Categories</b>	<i>Satisfactory</i> <i>Conditional Satisfactory</i> <i>Unsatisfactory</i>	<i>Satisfactory</i> <i>Needs Improvement</i> <i>Unsatisfactory</i>	<b>Survey:</b> <i>Implemented</i> <i>Partially Implemented</i> <i>Not Implemented</i> <b>Site Visits:</b> <i>Satisfactory</i> <i>Conditional Satisfactory</i> <i>Unsatisfactory</i>
<b>Site Visit Follow-up Process/Timeline</b>	Additional site visits for <i>Conditional Satisfactory</i> or <i>Unsatisfactory</i> ranking. Stepped timelines, from 7 to 120 days, depending on follow-up results	Additional site visits for <i>Needs Improvement</i> or <i>Unsatisfactory</i> ranking. First follow-up within 120 days. Other visits scheduled as needed	Follow-up site visits based on ranking and location in priority water resource area (TMDL/ BMAP, etc.)
<b>OAWP Staff Involved</b>	DACS/Suwannee River Partnership staff	DACS/Lake Okeechobee staff	DACS Apopka staff – others to be determined
<b>Other Divisions/ Agencies Involved</b>	DACS Dairy and Animal Industry divisions; FDEP and SRWMD, as needed	FDEP and SFWMD, staff as needed	FDEP and applicable WMD staff, as needed
<b>Future Areas/ Commodities to be Addressed</b>	All participating farms	All ranches/farms with implemented Conservation Plans	<b>Near-term:</b> Gulf Citrus, Peace River Citrus, Vegetable/Row Crops <b>Long-term:</b> Nursery, Sod, Cow-Calf, Equine

Because of the tailored processes and reporting formats for BMP implementation assurance in the Suwannee River Basin, the Lake Okeechobee Watershed, and the remaining areas of the state, the findings for each of these programmatic components are presented separately in the next section of this report.

## BMP IMPLEMENTATION ASSURANCE – OAWP PROGRAM FINDINGS

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### FINDINGS FOR THE SUWANNEE RIVER BASIN

BMP Implementation assurance activities have been formally conducted in the Suwannee River Basin since 2005. The Suwannee River Partnership has produced two detailed annual reports on BMP “quality assurance.” The BMP participation rates and site inspection findings summarized below are from the 2007 annual report.

### ***BMP PARTICIPATION RATES***

#### **Dairies**

Forty-seven of the 53 dairies in the basin (89%) have Conservation Plans. Six farms have chosen not to participate in formal BMP implementation at this time. Of the 47 dairies participating:

- Thirty-eight farms are fully implementing their plans, representing approximately 36,000 cows out of about 40,700 (88%) in the basin.
- Forty dairies have installed structural waste management systems.

#### **Poultry**

Of 164 poultry farms in the basin, all are participating in BMP implementation, and 163 have fully implemented Conservation Plans. All 163 poultry farms with fully implemented plans have installed structural waste management systems.

#### **Vegetable and Agronomic Crops**

About 120,225 acres of crop farms are enrolled in BMPs under the FDACS Water Quality/Quantity BMPs for Vegetable and Agronomic Crops. This represents more than 70% of the crop farm acreage in the basin. The OAWP will be conducting implementation assurance statewide for vegetable and agronomic crops.

### ***SITE INSPECTION FINDINGS***

In 2007, 30 dairy and 129 poultry operations were inspected at least once, and some were visited twice or more. The total number of inspections was 55 for dairy and 188 for poultry. Inspection categories for poultry operations are litter management, mortality management, and litter records. Inspection categories for dairy operations are dairy collection and transport, manure storage, manure utilization, and dairy record keeping. Not all inspection categories were ranked during each inspection.

#### **Ratings**

The Suwannee River Partnership produces an annual report on implementation assurance, titled the *BMP Quality Assurance Annual Report*. **Table 5** shows the ratings given for BMP implementation by inspection category, according to the 2007 annual report. **Note:** FDACS inspectors do not normally schedule their inspections, and if the producer is not available at the time of the visit to provide records for review, the inspector gives a rating of *Conditional Satisfactory* in the records category. A significant number of the *Conditional Satisfactory* ratings for poultry and dairy record keeping were due to this procedure.

**TABLE 5. SUMMARY OF SITE INSPECTION RESULTS FOR THE SUWANNEE RIVER BASIN (2007)**

BMPs	SATISFACTORY	CONDITIONAL SATISFACTORY	UNSATISFACTORY
<b>DAIRY (30 OPERATIONS VISITED)</b>	<b>Note:</b> Some dairy operations visited more than once		
Dairy Collection and Transport	42 (78%)	9 (17%)	3 (5%)
Manure Storage	46 (85%)	8 (15%)	0
Manure Utilization	47 (85%)	8 (15%)	0
Dairy Record Keeping	22 (40%)	29 (53%)	4 (7%)
<b>POULTRY (129 OPERATIONS VISITED)</b>	<b>Note:</b> Some poultry operations visited more than once		
Litter Management (188 ratings)	188 (100%)	0	0
Mortality Management (185 ratings)	181 (98%)	2 (1%)	2 (1%)
Litter Records (180 ratings)	100 (56%)	78 (43%)	2 (1%)

### BMP Implementation Deficiencies

The most common deficiency found in BMP implementation was in record keeping. Records may have been incomplete or, in some cases, not kept at all. However, not all of the ratings in this category may be reliable, as previously noted.

### Educational needs

There is a need to continue to provide information on:

- The requirements of water resource regulatory programs applicable to agriculture,
- The environmental and economic benefits of BMPs,
- The long-term commitment required in implementing BMPs, and
- The importance of record keeping.

### FINDINGS FOR THE LAKE OKEECHOBEE WATERSHED

The Lake Okeechobee Watershed BMP implementation assurance effort (also referred to as “quality assurance”) formally began in November 2007. The effort currently is focused on the four priority basins identified in statute (S-191, S-154, and Pools D and E in the Lower Kissimmee River), but will be conducted in the entire watershed.

### ***BMP PARTICIPATION RATES***

Approximately 550,000 acres are enrolled in the Lake Okeechobee Protection Program under 242 NOIs. Each enrolled operation is required by FDACS rule (5M-3, Florida Administrative Code) to develop and implement an RMS-level Conservation Plan, Agricultural Nutrient Management Plan, or equivalent plan approved by FDACS.

### ***SITE INSPECTION FINDINGS***

Between February 2007, and June 2008, OAWP staff inspected 57 cow-calf operations with completed Conservation Plans, which represent about 100,500 acres. Some of these operations include other commodities, which are also addressed by their plans.

### Ratings

Overall, 67% of the operations initially visited received an overall rating of *Satisfactory*, and 33% received an overall rating of *Needs Improvement*. **Table 6** provides a summary of the site inspection findings for the Lake Okeechobee Watershed BMP program by category.

**TABLE 6. SUMMARY OF SITE INSPECTION RESULTS FOR LAKE OKEECHOBEE WATERSHED**

INSPECTION QUESTIONS	YES	NO	NI <sup>1</sup>	N/A <sup>1</sup>
<b>Facility Operation Information</b>				
Are all implemented Best Management Practices within this facility operated and maintained according to the applicable NRCS Conservation Practice Standard and/or the site specific conservation plan?	45	0	12	0
Is the Nutrient Management Component of the site specific conservation plan fully implemented, with all applicable records kept?	49	0	8	0
<i>Have there been any changes to operations size and or parcels included in operation?</i>	1	56		
<b>Nutrient Management</b>				
Have applicable nutrient management BMPs been implemented according to the schedule indicated in the NOI?	45	12		
Are there circumstances to be considered such as educational needs, natural disasters, or other considerations?	3	54		
Are records adequate for the applicable BMPs designated on the NOI?	53	4		
<b>Irrigation Management</b>				
Have applicable irrigation management BMPs been implemented according to the schedule indicated in the NOI?	6	0		51
Are there circumstances to be considered such as educational needs, natural disasters, or other considerations?	0	6		51
Are records adequate for the applicable BMPs designated on the NOI?	5	1		51
<b>OVERALL RATINGS</b>				
	S <sup>1</sup>	U <sup>1</sup>	NI <sup>1</sup>	% S
	38	0	19 <sup>2</sup>	67%

<sup>1</sup> NI - Needs Improvement; N/A - Not Applicable; S - Satisfactory; U - Unsatisfactory

### BMP Implementation Deficiencies

Reasons for ratings of *Needs Improvement* include:

- On 12 operations some of the BMPs were not yet implemented. In some cases, the producer could not afford to implement BMPs without cost share because of escalating costs. For example, the cost to install culverts has tripled since some producers signed up to implement BMPs.
- On 7 operations, the producer did not have the required soil test (Mehlich 1). Often, the laboratories that conduct the soil testing do not offer the Mehlich 1 test, but routinely perform another type of test (e.g., Mehlich 3). Mehlich 3 is a more recent test that covers more soil types and has been adopted by numerous laboratories throughout the southeastern United States. However, FDACS rules reference UF/IFAS recommendations for soil testing, which identify Mehlich 1 as the test to use. UF/IFAS is in the process of re-evaluating this recommendation. Most of the 7 producers with this deficiency have obtained or are obtaining the Mehlich 1 test.
- On some of these operations, record keeping was not adequate.

## FINDINGS FOR OTHER AREAS OF THE STATE

### ***RIDGE CITRUS BMP IMPLEMENTATION ASSURANCE***

The Ridge Citrus BMP has been in place since 1996. Unlike the other OAWP citrus BMP programs, the Ridge Citrus program consists of a single, multi-faceted BMP that focuses on the rate and timing of nitrogen (N) applications to citrus groves on Florida's sandy ridge soils. The BMP prescribes maximum N rates for single applications and for total annual application. These maximums vary according to the following ages of the blocks of trees being fertilized: 1-3 years, 4-7 years, greater than 7 years.

### **BMP Program Enrollment**

Based on information derived from the OAWP Best Management Practices Tracking System, staff identified 1,886 Ridge Citrus NOIs to be surveyed. These NOIs were submitted under 214 unique contacts, and represent 107,216 acres. It is not possible to provide a reasonable estimate of potential acres to which the Ridge Citrus BMP would apply, because the BMP is based on soil type rather than a geographic region of the state. Therefore, the enrolled acres cannot be expressed as a percentage of the potential Ridge Citrus acres.

### **Survey Findings**

#### ***Response Rates***

On September 7, 2007, OAWP mailed a written survey to 199 of the 214 contacts listed in BMPTS for all operations that had submitted NOIs. These were to be completed and returned by October 15, 2007 (See **Appendix 4** for a copy of the survey), with responses based on 2006 records. The remaining 15 contacts were the largest-acreage producers, each with more than 40 NOIs listed under their names. These 15 contacts were scheduled for onsite visits by OAWP staff to evaluate their implementation of the BMP, using the written survey.



As of May 31, 2008, 133 survey responses had been received and twelve of the fifteen site visits completed. This provides a total response of 145 out of the 214 contacts, with three site visits pending. Sixty-six producers did not respond, even after repeated attempts to contact them. These 66 are presumed to be inactive at present; however, OAWP staff will make an additional attempt to contact them before categorizing them "inactive" in the BMPTS.

#### ***Program Participation***

Of the 214 survey contacts, 130 were verified as "active" in the Ridge Citrus BMP program. Of these 130 producers:

- 127 indicated they want to continue participating in the BMP program.
- Three producers indicated that they would like to discontinue their participation at this time. *Staff will contact these producers prior to categorizing them "inactive."*
- Three producers indicated that they would like additional help in more fully implementing the BMP in their operations. *Staff will follow up with these producers to determine and provide the specific help needed.*
- One producer did not answer either question as to continuation in the program or help needed. *Staff will contact this producer regarding these items.*

**Table 7** below summarizes the survey response rates and status of participation by producers enrolled in the Ridge Citrus BMP.

<b>TABLE 7. RIDGE CITRUS BMP SURVEY RESPONSE RATE AND PROGRAM PARTICIPATION</b>			
	<b>SURVEY DATA</b>	<b>RELATED NOIs<sup>1</sup></b>	<b>BMPTS ACRES<sup>1</sup></b>
<b>SURVEY RESPONSE INFORMATION</b>			
# Producers Enrolled in BMPTS <sup>1</sup>	214	1,886	107,215.83
# Surveys Mailed (# Producers)	199	1,017	74,132.28
# On-site Surveys Conducted	12	651	22,984.35
# On-site Surveys Pending	3	218	10,099.20
# Responses to Survey via mail	133	786	56,007.68
# Producers Not Responding	66	231	18,124.60
<b>PROGRAM PARTICIPATION STATUS</b>			
# Producers Confirmed Active via Response	130	1,107	70,323.01
# Acres Reported Active via Response	69,823.41	1,107	<i>To be adjusted</i>
# NOIs Confirmed or Presumed Inactive		561	26,793.62
▪ # NOIs Confirmed Inactive via Response <sup>2</sup>		330	8,669.02
▪ # Producers Presumed Inactive	66	231	18,124.60

<sup>1</sup> After removal of duplicates

<sup>2</sup> Includes 15 producers totally out of production

**Ridge Citrus BMP Implementation – Overall Survey Findings**

The following results are derived from all surveys submitted, including those completed onsite. Overall adherence to the BMP rates was high. Information regarding BMP implementation for specific blocks of trees is provided below.

Blocks of One- to Three-Year-Old Trees

For this age group, the Ridge Citrus BMP prescribes the following fertilization rates:

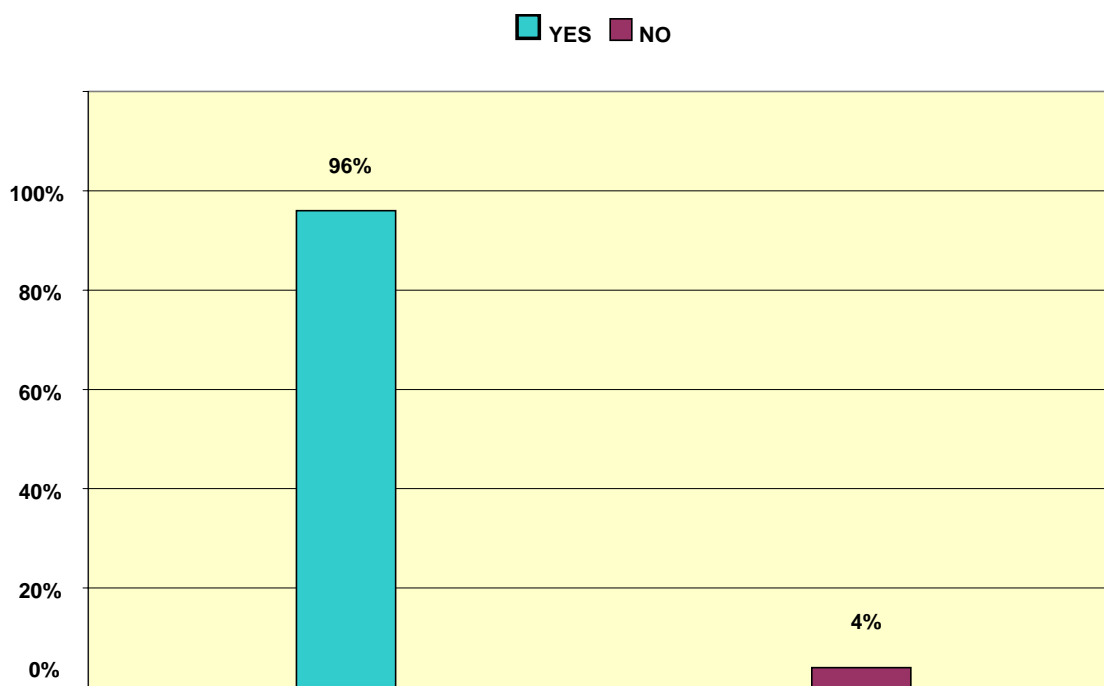
<p>Maximum N <b>Broadcast</b> Application Rate for:</p> <ul style="list-style-type: none"> <li>▪ 1-year-old trees is 0.05 lbs. N/tree/application</li> <li>▪ 2-year-old trees is 0.12 lbs. N/tree/application</li> <li>▪ 3-year-old trees is 0.225 lbs. N/tree/application</li> </ul>	<p>Maximum N <b>Fertigation</b> Application Rate for:</p> <ul style="list-style-type: none"> <li>▪ 1-year-old trees is 0.03 lbs. N/tree/application</li> <li>▪ 2-year-old trees is 0.06 lbs. N/tree/application</li> <li>▪ 3-year-old trees is 0.09 lbs. N/tree/application</li> </ul>
<p>Maximum <b>Total Annual</b> N Application Rate for:</p> <ul style="list-style-type: none"> <li>▪ 1-year-old trees is 0.30 lbs. N/tree/year applied as a minimum of 6 broadcast, or 10 fertigation events</li> <li>▪ 2-year-old trees is 0.60 lbs. N/tree/year applied as a minimum of 5 broadcast, or 10 fertigation events</li> <li>▪ 3-year-old trees is 0.90 lbs. N/tree/year applied as a minimum of 4 broadcast, or 10 fertigation events</li> </ul>	

Twenty-five responders indicated that they had some blocks of 1- to 3-year-old trees. Of these:

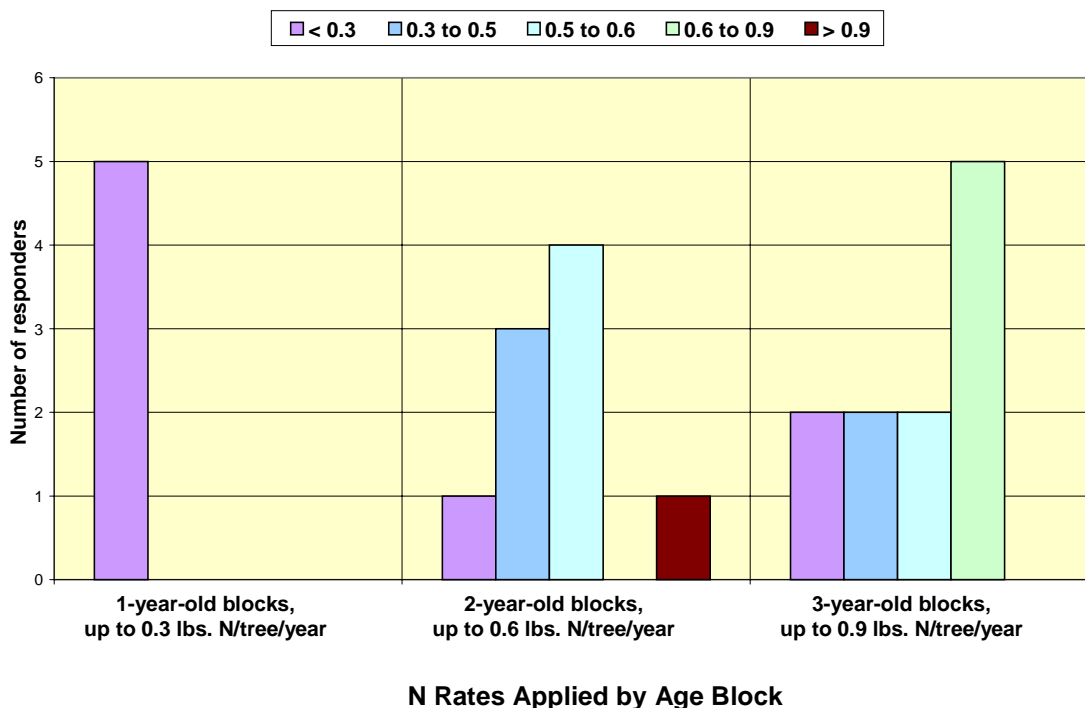
- One producer indicated that not all per-tree applications were within BMP rates (see **Figure 1**). However, this operation's total annual N rate per tree was below that prescribed in the BMP.
- One producer indicated that the total annual N rate per tree was greater than the allowable rate rates (see **Figure 2**), but all individual applications were within the required per-tree rate. This may have resulted from too many individual applications within the calendar year. *This producer requested and will receive additional help in implementing the BMP.*

**Figures 1 and 2** below display the rates of adherence to the Ridge Citrus BMP for 1- to 3-year-old blocks of trees. Both figures are based only on responses from the 25 growers who had tree blocks in that age group.

**FIGURE 1. PERCENT OF APPLICABLE PRODUCERS (25) WITHIN THE RIDGE CITRUS BMP INDIVIDUAL APPLICATION RATE PER TREE FOR 1- TO 3-YEAR-OLD BLOCKS OF TREES**



**FIGURE 2. TOTAL ANNUAL N APPLICATION RATES ON 1- TO 3-YEAR-OLD RIDGE CITRUS**



Blocks of Four- to Six-Year-Old Trees

For this age group, the Ridge Citrus BMP prescribes the following fertilization rates:

- The maximum **Dry Season** lbs N/acre/application is 65 lbs N for broadcast applications, or 15 lbs N by fertigation
- The maximum **Wet Season** lbs N/acre/application is 40 lbs N for broadcast applications, or 10 lbs N by fertigation
- The maximum **Total Annual** lbs N/acre is 200 lbs N/acre
- The maximum **Total Wet Season** lbs N/acre is 40 lbs N/acre as a minimum of 1 broadcast or 4 fertigation events
- Total N/acre/year shall not exceed 200 pounds for round oranges. Lower or higher rates may be required during a calendar year due to scheduling, horticultural, or climatic factors, but the *average annual rate over the four-year period* may not exceed the maximum rate.

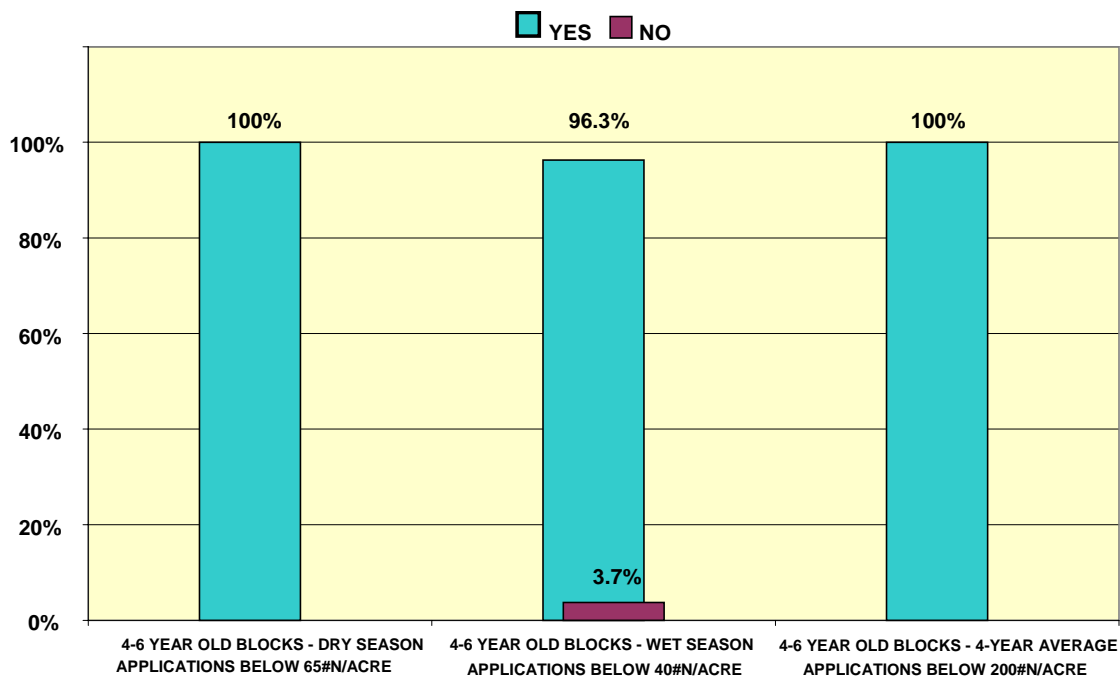
Twenty-eight producers indicated they had some blocks of 4- to 6-year-old trees. Of these producers:

- In all 28 cases, the producers reported that their average annual N rate per acre was below 200 lbs/year (*based on a four-year annual average*).

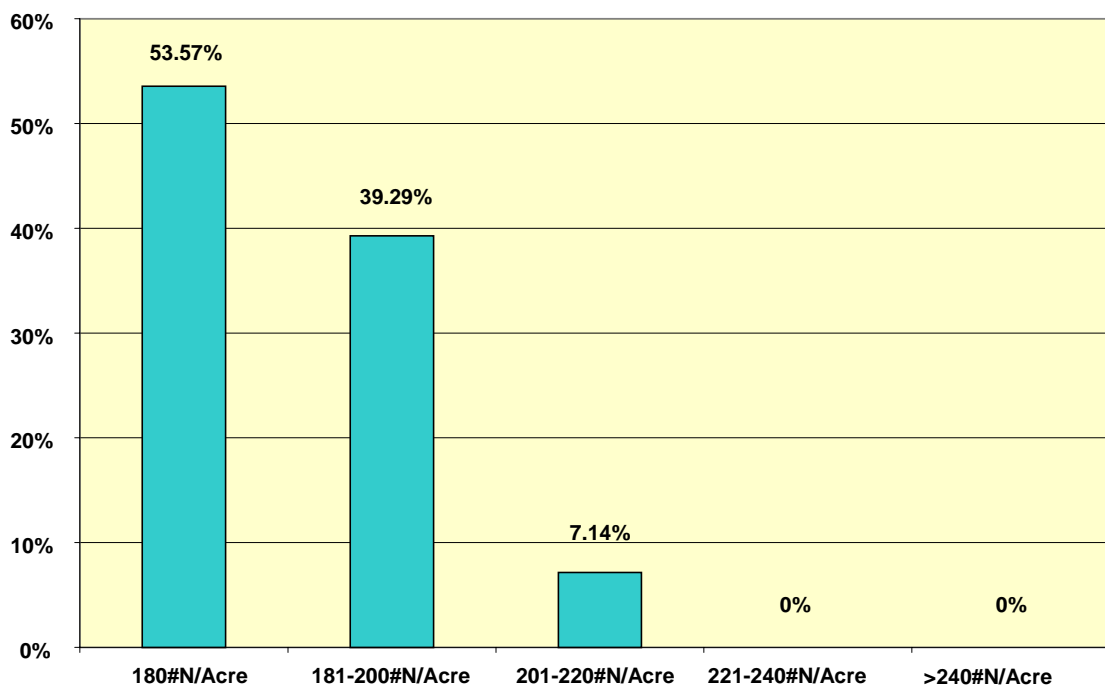
- Twenty-seven indicated that all non-Wet Season individual N applications were within the BMP rate of 65 lbs/acre.
- Twenty-six producers indicated that *Wet Season* applications were below the BMP's 40 lbs/acre rate. One producer reported making applications above the *Wet Season* rate during 2006. *This producer requested assistance.*
- One producer did not answer any of the questions regarding individual application rates on 4- to 6-year-old blocks, but responded that the total annual and average annual rates were well below BMP rates. This could indicate that the producer made only one or two applications per year. Individual applications might have exceeded BMP rates, while the annual total stayed within the rates.
- With regard to the total N/acre rate for 2006:
  - Fifteen producers indicated total N application of less than 180 lbs/acre.
  - Eleven producers were between 181 and 200 lbs/acre.
  - Two producers indicated rates between 200 and 220 lbs/acre.

Figures 3 and 4 display the rates of adherence to the Ridge Citrus BMP for 4- to 6-year-old blocks of trees.

**FIGURE 3. PERCENT OF PRODUCERS WITHIN RIDGE CITRUS BMP N/ACRE APPLICATION RATES FOR 4- TO 6-YEAR-OLD BLOCKS OF TREES**



**FIGURE 4. PERCENT OF PRODUCERS WITHIN THE RIDGE CITRUS BMP TOTAL ANNUAL N/ACRE APPLICATION RATE FOR 4- TO 6-YEAR-OLD BLOCKS OF TREES FOR 2006**



#### Mature Production Blocks (Trees of 7+ Years)

For this age group, the Ridge Citrus BMP prescribes the following fertilization rates:

- The maximum **Dry Season** lbs N/acre/application is 65 lbs N for broadcast applications, or 15 lbs N by fertigation
- The maximum **Wet Season** lbs N/acre/application is 40 lbs N for broadcast applications, or 10 lbs N by fertigation
- The maximum **Total Annual** lbs N/acre is 240 lbs. N/acre
- The maximum **Total Wet Season** lbs N/acre is 40 lbs N/acre as a minimum of 1 broadcast or 4 fertigation events

Of the producers responding to the survey, 123 indicated they had mature blocks, 7+ years of age. Of these 123 producers, 120 reported that all of their individual Dry Season applications were within the BMP rate of 65 lbs N/acre, and 106 reported that their *Wet Season* applications were within the BMP rate of 40 lbs N/acre.

The standard annual N application rate for mature groves is 240 lbs N/acre/year. Of the respondents with mature groves, 114 reported being within this annual rate. Nine producers reported application rates of between 240 and 270 lbs N/acre/year.

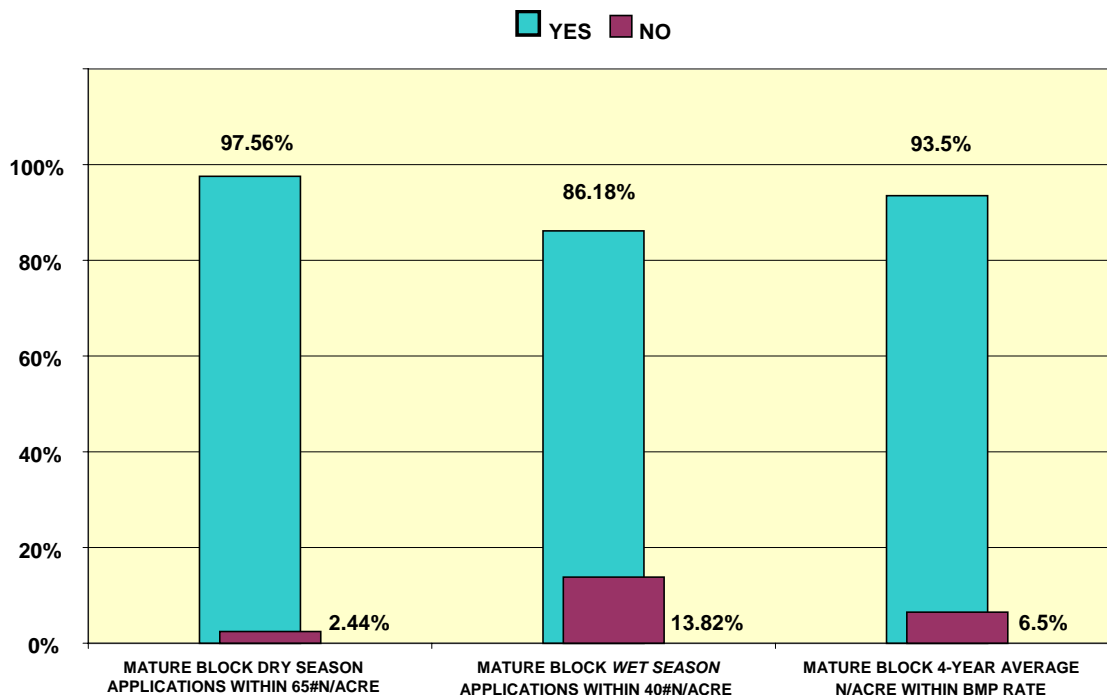
However, the Ridge Citrus BMP makes allowance for high-producing mature groves to exceed the standard annual application rate. The BMP states:

*“Nitrate application rates above 240 lbs of N/acre/year must be justified by a prior three-year production average of 700 boxes per acre minimum for early and mid-season oranges, and 500 boxes for ‘Valencia’ oranges. Lower or higher rates may be required during a calendar year due to scheduling, horticultural, or climatic factors, but the average annual rate over the four-year period may not exceed the maximum rate without the documented three year production average. Under no circumstances can the average annual rate over the four-year period exceed 270 pounds of N/acre.”*

Of the nine producers reporting applications between 240 and 270 lbs N/acre/year, one classified as a high-producing block and could be considered within the allowable annual BMP rate. The other eight exceeded the allowable rate for their circumstances. Therefore, 115 (rather than 114) of the 123 producers with mature groves were within the allowable BMP total annual N application rates for that age group.

**Figure 5** displays the rates of adherence to the Ridge Citrus BMP for mature blocks of trees.

**FIGURE 5. PERCENT OF PRODUCERS WITHIN RIDGE CITRUS BMP N/ACRE APPLICATION RATES FOR MATURE TREES (7+ YEARS OLD)**



**Ridge Citrus BMP Implementation - On-Site Survey Findings**

OAWP staff conducted site visits with twelve large-acreage producers enrolled under the Ridge Citrus BMP program. The results of the twelve visits are included in the overall survey data previously presented in this report. Visits with an additional three large-acreage producers are pending. The twelve sites visited represent 651 NOIs covering 22,984 acres, as listed in BMPTS. Of these, the number of NOIs confirmed as "active" is 514, covering 20,029 acres (28.5% of the total acres confirmed as "active").

The twelve surveys conducted on site confirmed a high rate of adherence to the Ridge Citrus BMP, based on a review of records and discussion with operation owners or managers. It was evident that many of the producers visited had changed aspects of their production management to accommodate the BMP requirements, including modifying the rate and timing of applications.

Of the 12 producers visited:

- Five had blocks in the 1-3 year age group. Of these five, all were within individual BMP application rates, as well as within BMP total annual N rates. All expressed concerns as to the availability of trees, and the current uncertainties of the industry in facing canker and greening.
- Four producers had blocks in the 4-6 year age group. All four were within the Dry Season and *Wet Season* application rates, and for 2006 were below the maximum rate of 200 lbs N/acre on all of these blocks.
- All 12 producers had mature production blocks (7+ years). Eleven were within BMP rates for all general and wet season applications. One producer was slightly over the BMP rate of 65 lbs N/acre on one application (at 68 lbs N/acre), due to a calibration error. OAWP staff stressed the need for care in all calculations and record-keeping procedures, and recommended providing a small buffer in calibration (setting spreaders for 60-62 lbs N/acre rate) to help prevent this type of error. This was the only divergence from the BMP noted among the twelve producers.
- Production records for the past three years showed that four of the 12 producers had high-production blocks. However, none exceeded the 240 lbs N/acre annual rate, even though the BMP would have allowed them to do so.

**Wet Season Applications**

A significant challenge producers appeared to face in meeting Ridge Citrus BMP requirements was with regard to *Wet Season* applications (June 15 - September 15). Seventeen of the 130 active respondents indicated they had *Wet Season* applications that exceeded the BMP rate of 40 lbs N/Acre. These 17 operations, most of which are one- or two-grove producers, cover a total of 1,792.75 acres (2.57% of the total acreage for active NOIs).

During the site visits, producers often stated they no longer make N applications during the *Wet Season*. Reasons they gave were:

- 1) It is not economically efficient, i.e., the additional yield does not warrant the costs involved.
- 2) The application equipment does not calibrate well down to the 40 lbs N/Acre rate.

Producers that had installed fertigation systems on some of their operations continue to use them through the *Wet Season*, but the majority of the large producers indicated they do not make dry applications during this time period.

### ***INDIAN RIVER CITRUS BMP IMPLEMENTATION ASSURANCE***

The *Water Quality/Quantity BMPs for Indian River Area Citrus Groves* (Indian River Citrus BMPs) manual has been in place since May 2000. The manual applies to the Indian River Lagoon, Lake Okeechobee, and St. Lucie River watersheds, which include citrus-producing regions of Volusia, Brevard, Indian River, Okeechobee, St. Lucie, Highlands (*also part Ridge Citrus*) and Martin Counties. The BMPs address water management, sediment transport, pesticides, nutrients, and aquatic plants.

Participating producers enroll in the program by submitting a Notice of Intent (NOI) to implement the BMPs to the Office of Agricultural Water Policy. On the NOI, the producer identifies the practices applicable to the operation. Applicable practices are those that address existing water quality and quantity issues and are technically and economically feasible to implement. Consequently, each individual NOI is tailored to the needs and characteristics of the operation.

The Indian River Citrus BMP Survey addressed only the irrigation and nutrient management BMPs because these 27 practices are considered the “core” water quality BMPs in the manual. Other BMP categories under this program are sediment, pesticides, and aquatic plants. A survey containing all 64 BMPs in the manual would have been excessively long. Also, the other practices contained in the manual are regulated practices, and are subject to review and compliance checks by the responsible agencies. The overall intent of the survey was to gather information on the status of IRC BMP implementation, and identify trends in and difficulties with implementation that might be addressed through various forms of outreach. The survey, contained in **Appendix 5**, consisted of:

- ✓ A cover letter and instruction sheet.
- ✓ A data update sheet.
- ✓ A summary sheet of all the water and nutrient management practices from the BMP manual, for the producer to indicate the practices identified on the original NOI.
- ✓ A series of questions about the current management practices being implemented on their operations. These questions related to specific BMPs in the survey.
- ✓ A section soliciting feedback on preferred format, delivery, and sources of educational assistance.

### **BMP Program Enrollment**

Based on information derived from the OAWP Best Management Practices Tracking System, staff identified 532 NOIs to be surveyed. These NOIs were listed under a total of 98 unique contacts, and represent a total of 200,116 acres.

## Survey Response Rates and Findings

### Response Rates

On November 26, 2007, ninety-three of the 98 producers were mailed a survey, to be completed based on 2006 records and returned by December 30, 2007. The remaining 5 producers (with the most NOIs per producer) will receive site visits to complete the survey. Of the 93 mail-outs, 42 surveys were submitted. Four other producers responded by phone or mail that they were no longer in production. Forty-six producers did not respond after repeated attempts. These 46 producers are presumed to be inactive at present. However, OAWP staff will make an additional attempt to contact these producers before categorizing them “inactive” in the BMPTS. Possible reasons for the relatively low response rate include:

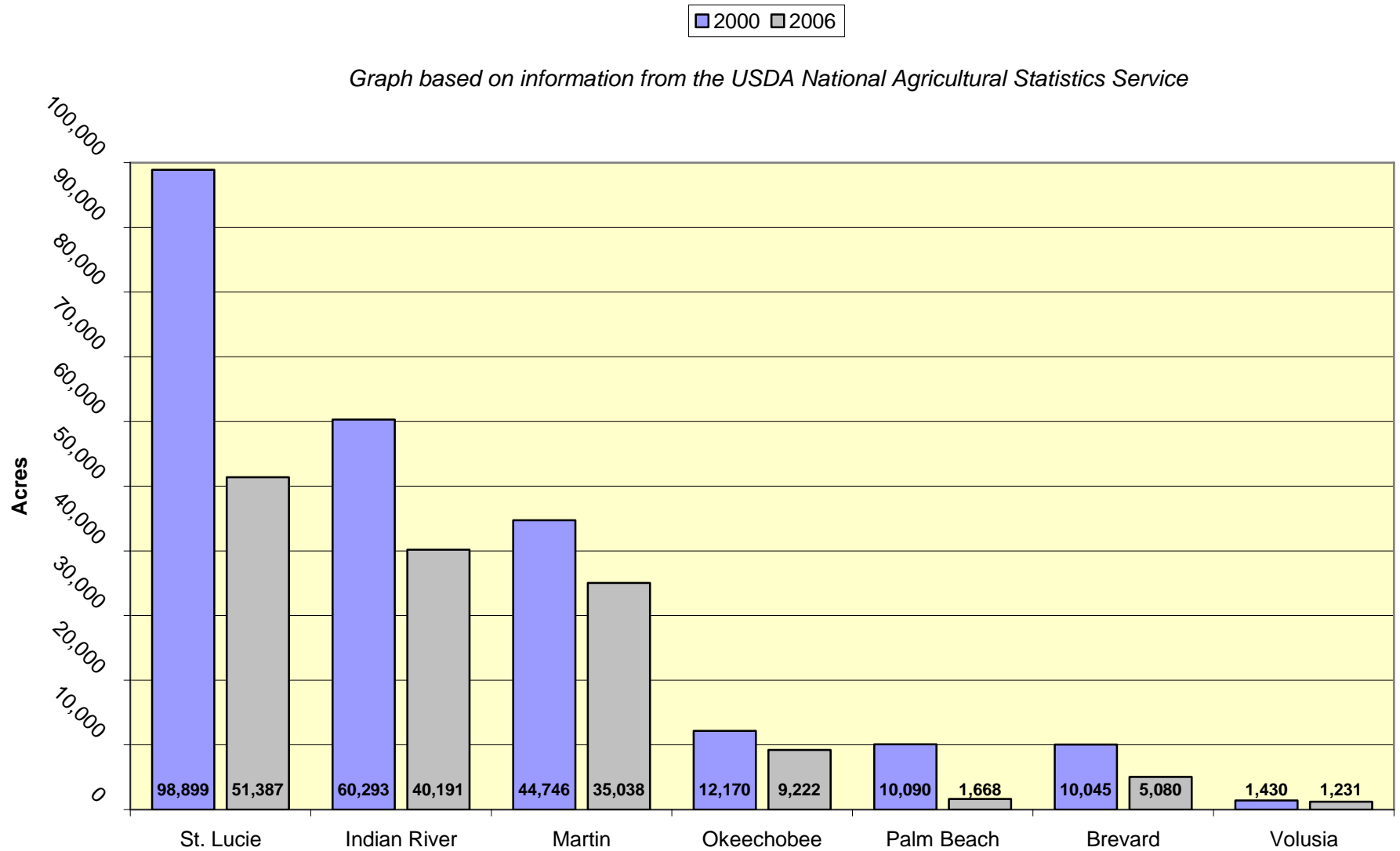
- Increases in land values have encouraged citrus growers to sell their groves to urban developers and investors, who can offer prices that exceed farm profits. The 2005 Florida Land Survey reported that the sale price of orange groves in Indian River, St. Lucie, and Martin counties rose 52%, and the value of grapefruit groves rose 88%, in one year. Land likely to be converted to residential or commercial use within five miles of a major town in Palm Beach County is worth \$137,500 per acre. In Indian River County, the value is \$46,481 per acre. In St. Lucie and Martin counties, which are classified non-metropolitan, the value of agricultural acreage within five miles of a major town has increased from \$6,778 to \$17,143 per acre.<sup>1</sup>
- The Indian River Citrus region was the landfall area for hurricanes Frances and Jeanne in 2004, and Wilma in 2005. These storms caused extensive damage to many blocks of citrus. It is believed that these storms also contributed to spreading citrus canker throughout the area.
- The USDA Canker Eradication Program mandated the destruction of all citrus trees within a quarantine radius of 1900 feet. This has the effect of creating a 262 acre hole around every infected tree. The eradication program claimed 22,820 acres in St. Lucie County in 2005 alone.
- Just as the canker eradication program ended, a new and considerably more potent threat to Florida’s citrus industry arose: citrus greening. Citrus greening occurs from a bacterial disease that attacks the vascular system of plants. At present, there is no cure for the disease. Infected trees produce bitter, inedible fruit, and eventually die.
- Unfortunate timing also may have come into play. The IRC survey reached producers about the same time as did a USDA survey on canker and greening. Reported grower hesitation to complete the USDA survey may have affected response to the FDACS survey, as some growers may have confused the two.

**Figure 6** shows the decrease in citrus acreage from 2000 to 2006 in counties with acres enrolled in the Indian River Citrus BMP program. There was a total decrease during this time period of 93,856 acres in seven counties.

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<sup>1</sup> Information taken from: Trends in Florida Citrus with Emphasis on Indian River, St. Lucie, Martin, and Palm Beach Counties. <http://edis.ifas.ufl.edu/FE636>

**Figure 6. Total Citrus Acreage for 2000 and 2006 in Counties with Acreage Enrolled in the Indian River Citrus BMP Program**



## Survey Findings

### Program Participation

Of the 98 survey contacts, 43 were confirmed as “active” in the Indian River Citrus BMP program. All 43 producers indicated that they wanted to remain in the program, and none indicated any need for additional help in understanding or implementing the BMPs. One conclusion that might be drawn from this is that they feel they have a good grip on the BMPs, and their bigger concerns are with the current challenges to staying in business.

**Table 8** provides a summary of the survey response rates and status of participation by producers enrolled in the Ridge Citrus BMP.

TABLE 8. INDIAN RIVER BMP SURVEY RESPONSE RATE AND PROGRAM PARTICIPATION			
	Survey Data	Related NOIs <sup>1</sup>	BMPTS Acres <sup>1</sup>
<b>SURVEY RESPONSE INFORMATION</b>			
# Producers Enrolled in BMPTS <sup>1</sup>	98	532	200,11594
# Surveys Mailed (# Producers)	93	364	173,705.09
# On-site Surveys Conducted	0	N/A	N/A
# On-site Surveys Pending	5	168	26,410.85
# Responses to Survey via Mail	47	211	109,093.20
# Producers Not Responding	46	153	64,611.89
<b>PROGRAM PARTICIPATION STATUS</b>			
# Producers Confirmed Active via Response	43	151	93,637.30
# Acres Reported Active via Response	83,004.70	151	To be adjusted
# NOIs Confirmed or Presumed Inactive	→	213	80,067.79
▪ # NOIs Confirmed Inactive via Response	→	60	15,455.90
▪ # Producers Presumed Inactive <sup>2</sup>	46	153	64,611.89

<sup>1</sup> After removal of duplicates

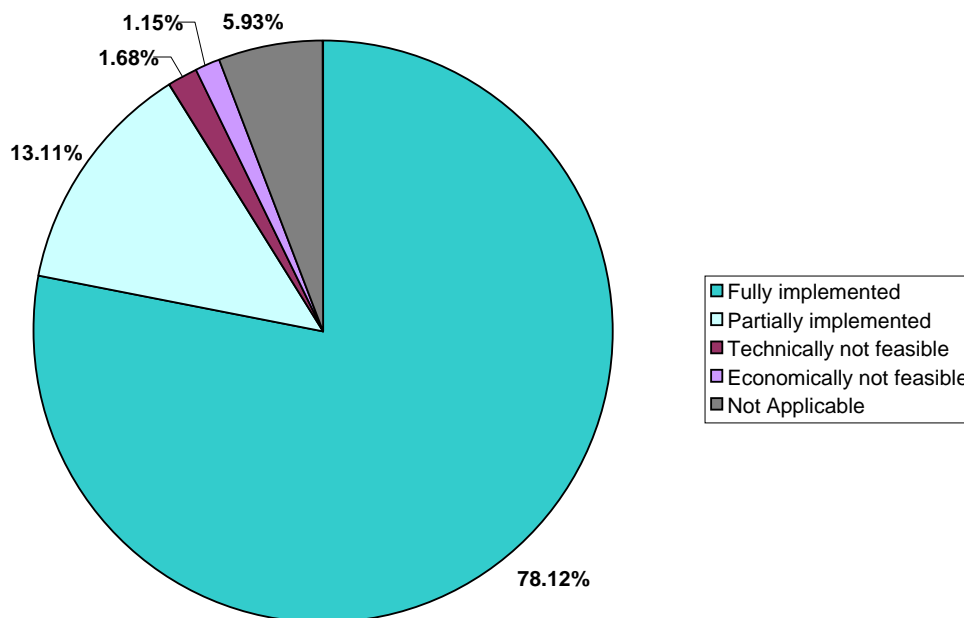
<sup>2</sup> Includes 4 producers totally out of production

### Indian River Citrus BMP Implementation

The IRC survey was developed to capture as much as possible the current implementation of IRC BMPs by the producers. The first page of the survey allowed producers to indicate which of the 27 BMPs surveyed they had selected on their NOIs, and the status of each BMP's implementation (*fully implemented, partially implemented, or reason not implemented*). OAWP staff did not confirm whether the BMPs the growers identified on the survey were an exact match with the BMPs selected on their NOIs.

**Figure 7** shows the breakdown of survey responses as to the current implementation level of specific BMPs contained in the IRC BMP manual. Forty-two of the 43 producers confirmed to be active completed the survey. Not all of the 42 producers completed all items as to selected practices. Collectively, however, their responses indicated that 91.23% of the 27 practices surveyed are being fully or partially implemented in their operations. The remaining practices were identified as not applicable or not technically or economically feasible.

**FIGURE 7. RESPONSES REGARDING IMPLEMENTATION LEVEL OF SPECIFIC INDIAN RIVER CITRUS BMPs, AS LISTED IN THE MANUAL**

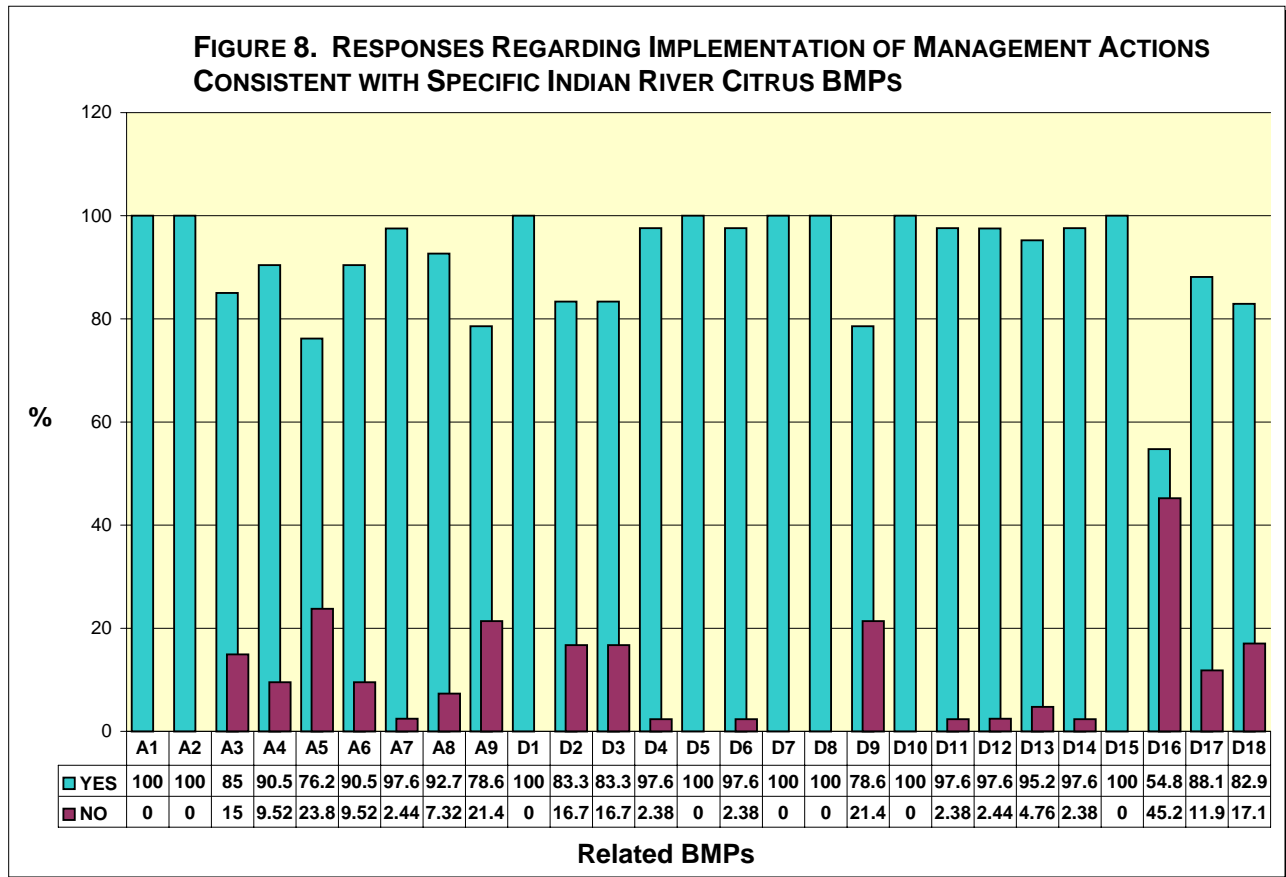


As noted earlier, the IRC survey included a listing of all the water and nutrient management practices from the BMP manual, for the producer to indicate the practices identified on the original NOI and the level of BMP implementation (*fully implemented, partially implemented, not implemented*). The survey also contained a series of “yes/no” questions about current management actions conducted on their operations. This provided a means to double check reported BMP implementation by matching responses about the level of implementation for the 27 BMPs surveyed to responses about related management actions. For example, Question 1 of the survey relates to BMP A1 (Water Table Management):

1. *Indicate which of the following water table management practices your operations use:*
  - a. *Ditch/canal system with sufficient hydraulic capacity*
  - b. *Water control structures on culverts*
  - c. *A properly designed, constructed, and maintained drainage system*
  - d. *Active water table monitoring*

A “yes” answer to one or more of options a. - d. would confirm a response that the BMP is being fully or partially implemented. The management action questions and their relationship to the BMPs are contained in **Appendix 6**.

**Figure 8** shows which of the management actions (as matched to the BMPs) the producers indicated they are implementing. Based on the producers’ collective responses, they are implementing an average of 91.31% of these actions in their operations, which correlates well with their indication that 91.23% of the 27 BMPs surveyed are being fully or partially implemented (See **Figure 7** above).



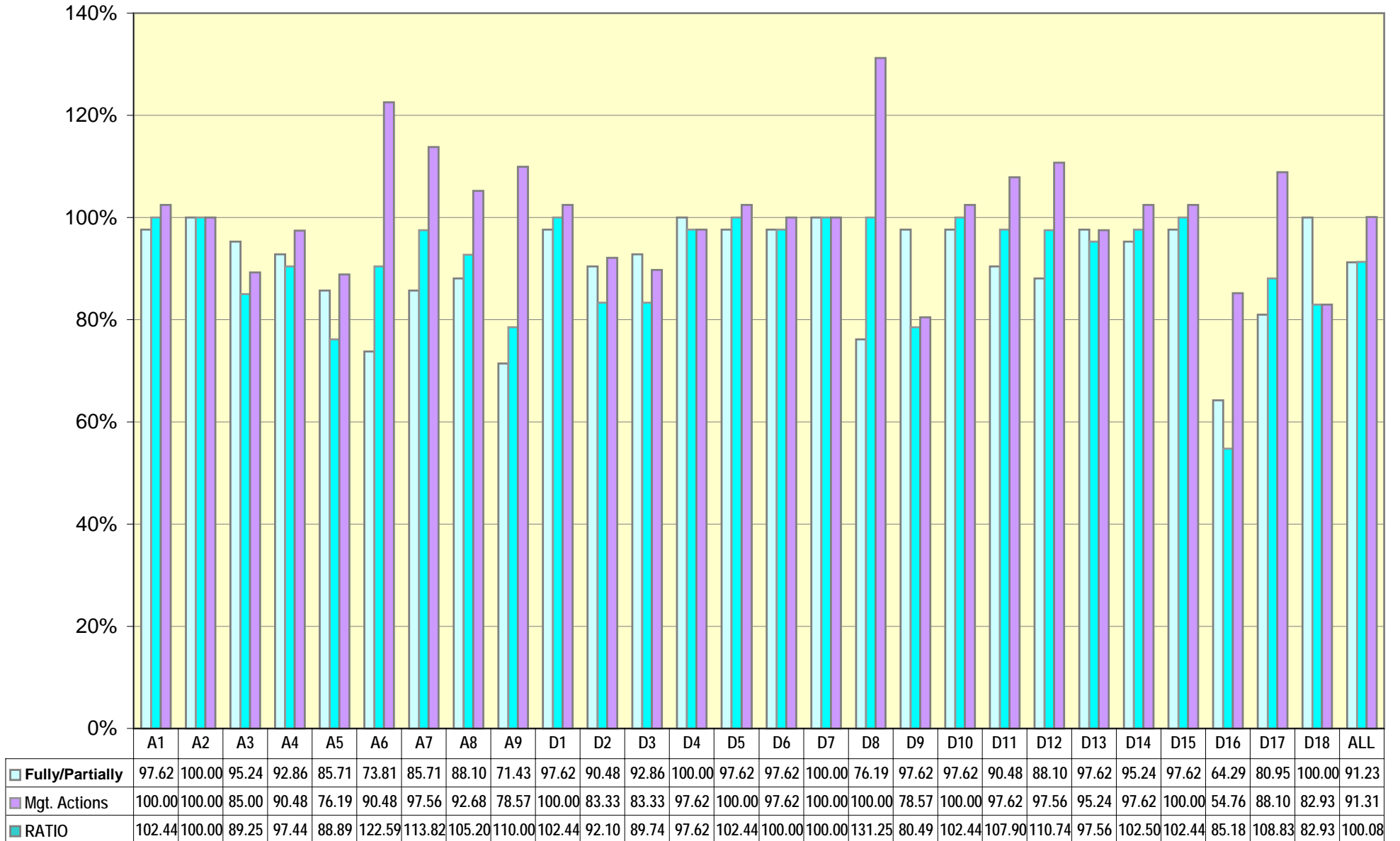
It is important to note that:

- a) A producer may not have been able to implement a practice that was selected on an NOI and
- b) A producer may have implemented practices not selected on an NOI.

A comparison of the BMPs shown by producers as being on their NOIs, and being fully or partially implemented, to their responses about related management actions illustrates whether what is expected from these enrollees is actually happening in the field. A ratio above 100% indicates that some producers are implementing a practice not selected on their NOIs. A ratio below 100% indicates that, some producers are not implementing a practice selected on their NOIs.

The ratio of BMPs indicated as being fully or partially implemented to related management actions being carried out ranges from 80.49% to 131.25%. As shown in the ALL column of **Figure 9**, the ratio between these two sets of results (100.08%) shows that producers collectively are implementing slightly more than is expected of them based on their NOIs. The raw data for Figures 7, 8, and 9 are contained in **Appendix 7**, which provides information on implementation rates for each BMP in the survey.

**FIGURE 9. COMPARISON OF GROWER-SELECTED INDIAN RIVER CITRUS BMPs TO RELATED MANAGEMENT ACTIONS**



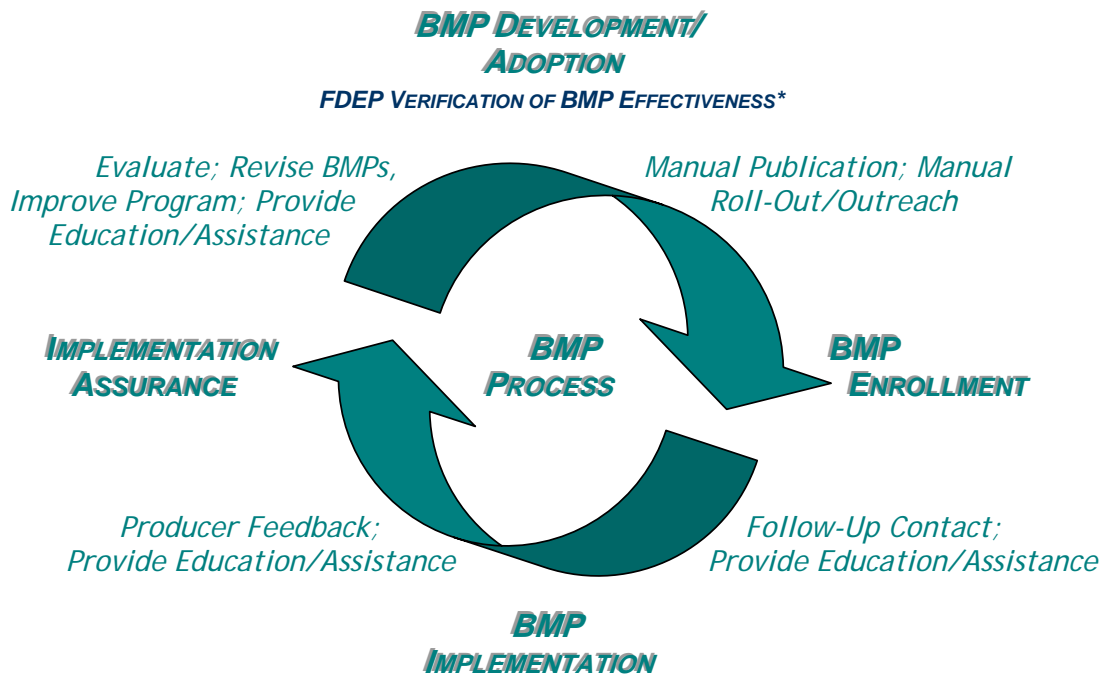
## OBSERVATIONS AND FUTURE STEPS

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### THE BMP PROGRAM CYCLE

Following up with agricultural producers on the implementation of BMPs is essential to the credibility and success of Office of Agricultural Water Policy BMP programs. It provides information on producer understanding of the BMPs, whether and how well the practices are being conducted, educational needs, and potential weaknesses in the drafting and/or substance of the practices. Implementation assurance completes the loop that begins with BMP development, and the feedback from the follow-up process potentially affects all stages of the BMP program. **Figure 10** below depicts the FDACS/OAWP BMP program cycle. Although BMP revision appears at the end of the cycle, it can occur at earlier points, based on new information and research.

**FIGURE 10. OAWP AGRICULTURAL BMP PROGRAM CYCLE**



*\* Verification of BMP effectiveness occurs in two stages, initial (FDEP Best Professional Judgment) and confirmatory (at representative sites).*

### IMPLEMENTATION ASSURANCE – OBSERVATIONS AND FUTURE STEPS

Below are general and program-specific observations related to program structure and process, and producer participation in the BMP programs targeted in this report.

#### **GENERAL OBSERVATIONS AND FUTURE STEPS**

The discussion in this section addresses issues that apply to all or more than one of the region-based BMP programs covered in this report. Program-specific discussion follows this section.

## **BMP Development**

After years of drafting BMPs and manuals, OAWP staff have learned more effective ways of wording and presenting the practices. The OAWP is now developing manuals with the goal of enabling producers to select and implement BMPs with minimum assistance. Categories of practices fundamental to protecting water quality (such as nutrient management, irrigation management, erosion and sediment control, and pesticide management) have come to form the cornerstone of recently developed FDACS manuals. Specific practices within those categories are identified as generally applicable to all agricultural operations, and are referred to as *Level I* BMPs. The newer manuals also contain *Level II*, and sometimes *Level III* BMPs, which apply under specific conditions. The manuals include a decision-tree, assessment questionnaire, BMP checklist, and examples of record-keeping and other forms. The BMPs are drafted as clearly and concisely as possible, with references to more detailed information to support their implementation. However, the variation in agricultural operations, and the complexity and/or expense of some of the BMPs, will require that OAWP continue to provide some level of assistance to producers to enroll in and implement BMPs.

With this new approach, OAWP staff are reviewing older manuals and will be revising them to improve their clarity and usefulness to producers. This also provides an opportunity to fill gaps in certain BMP programs, such as citrus BMPs. Currently, there are four distinct citrus BMP programs adopted by FDACS rule: Ridge, Indian River, Gulf, and Peace River. The latter three of these contain essentially the same practices. These programs resulted from the initiative of the citrus industry within each region. However, there are other areas of the state with citrus operations for which formal FDACS programs are not available. This raises the possibility of consolidating the four programs into a statewide manual that provides for citrus producers in other regions to participate in and receive the benefits of a rule-adopted program. In the process, the BMPs can be updated and clarified as needed, still retaining any necessary regional differences.

**Future Steps:** OAWP staff will:

1. Continue to refine the development of BMP manuals to make them as effective and useful to producers as possible. Staff will complete the development and adoption of statewide manuals for the following commodities:
  - a. Sod
  - b. Cow/Calf
  - c. Equine
  - d. Specialty Fruit and Nut Crops
2. In close coordination with affected stakeholders, review all existing BMP manuals for needed improvements, and revise them as appropriate. Specific efforts will include review and possible revision of existing manuals for the following commodities:
  - e. Vegetable and Agronomic Crops – also possibly incorporate updated forage grass BMP
  - f. Container Nurseries – also incorporate in-ground nurseries, and possibly include updated leatherleaf fern BMP
  - g. Citrus Operations – possibly consolidate existing citrus manuals into a statewide program, specifying regional differences as needed.

### **BMP Enrollment**

In conducting implementation assurance, and in generally working with agricultural producers, it is evident that their attitudes toward government, cultural backgrounds, level of knowledge and understanding of BMPs, economic status, and other variables affect whether they choose to participate formally (through submitting NOIs) in BMP programs. Though agricultural BMPs have been widely promoted in Florida, there is a scarcity of information regarding the perceptions of producers about BMP programs, as influenced by these variables. Information on producer perceptions can be useful in developing BMPs, recruiting growers to implement BMPs, and devising appropriate education and technical assistance to ensure BMPs are carried out effectively.

**Future Steps:** OAWP staff will explore the benefit of conducting targeted surveys on producer perceptions and attitudes regarding BMP programs.

### **BMP Implementation**

Current survey and site inspection results show that producers who have enrolled and are still active in FDACS Okeechobee, Suwannee River, Ridge Citrus, and Indian River Citrus BMP programs are following through with BMPs at a high rate. However, each program faces issues with regard to producer understanding and implementation of specific BMPs. A common area of weakness among BMP programs is record keeping, which is critical to ensuring that BMPs are carried out and identifying where help is needed. Although record-keeping is a requirement of FDACS BMP programs, this has not always been effectively communicated to producers.

**Future Steps:** The OAWP will:

1. Promote continued emphasis (by FDACS, UF/IFAS, and producer associations) on the importance of BMP implementation, with particular attention to record keeping.
2. Explore the development of a regular BMP section in association newsletters as a communication and educational tool.
3. Evaluate and, if necessary, enhance the BMP enrollment process to ensure that producers are receiving adequate assistance in selecting and understanding applicable BMPs.
4. Ensure that a follow-up contact is made within 90 days of enrollment to determine whether additional assistance is needed.
5. Based on survey responses, site inspections, and other producer feedback, evaluate practices for possible priority for future cost-share, technical, and educational assistance.

### **Implementation Assurance - Process**

#### ***Tracking Enrollment/Participation***

In conducting the Ridge Citrus and Indian River Citrus BMP surveys, OAWP staff found that a significant number of growers are no longer in production. Anecdotal information indicates this is based primarily on economics, whether due to development pressure (increased land prices), disease or hurricane impacts, or other factors. Some producers still in production reported changes in acreage and crop types. A significant number of producers enrolled in BMP programs did not respond to the Ridge and Indian River

surveys, despite OAWP staff efforts to contact them. These continual shifts in agricultural production and BMP participation, both known and unknown, affect OAWP's ability to accurately track and report on BMP enrollment and implementation.

**Future Steps** – OAWP staff will:

1. Attempt to contact survey non-responders before categorizing them as “inactive” in the BMPTS.
2. Use information gathered from the implementation assurance process to update BMP tracking data in the BMPTS and other OAWP data bases.
3. Explore notifying producers of the importance of maintaining current contact data with OAWP through association newsletters.
4. Develop a simple NOI information update postcard, or other mechanism, for contacting producers at least every two years in order to maintain as accurate enrollment/participation figures as possible.
5. Attempt to confirm, through advanced contact via telephone and/or mail, whether enrolled operations are in production prior to mailing surveys. This will reduce the number of unnecessary mail-outs and serve to notify producers of upcoming surveys.

**Development of Survey Instruments**

As mentioned earlier in this report, OAWP staff consulted the survey methodology developed by Dr. Don A. Dillman, Regents Professor and the Thomas S. Foley Distinguished Professor of Government and Public Policy in the Departments of Sociology and Community and Rural Sociology at Washington State University. He also serves as Deputy Director for Research and Development in the Social and Economic Sciences Research Center.

Dr. Dillman's work emphasized the benefit of keeping survey questions as simple as possible, so that survey participants understand and feel comfortable answering the questions presented. For surveys to be effective, it is necessary that the producers feel a vested interest and perceive a benefit from responding. Such interests and perceptions are influenced by the design and presentation of the survey. The survey must be prepared such that there are no “wrong” answers.

Though participating in OAWP BMP programs is essentially voluntary, they exist to satisfy state and federal environmental requirements. In some cases, Florida law presents BMPs as a quasi-regulatory mechanism (e.g., implement BMPs or monitor water quality to show compliance with applicable regulations, or be subject to enforcement). Because of this association, producers may worry that particular survey responses will trigger regulatory consequences. Based on the high rates of response to the initial two surveys, it appears that producers were comfortable with the way the survey questions were constructed.

**Future Steps:** In future survey development and analysis, OAWP staff will:

1. Continue to refine survey questions to accurately gauge adherence to targeted BMPs in clear, direct terms; maintain simplicity of response to encourage participation in the surveys.

2. Incorporate the most recent guidance from Dr. Dillman's updated book, *Mail and Internet Surveys: The Tailored Design Method, 2<sup>nd</sup> Edition (2007)*.
3. Consider the feasibility of comparing practices selected on original NOIs (as listed in BMPTS) to producer survey responses regarding which practices they previously selected. This may be most useful in preparation for post-survey site visits.

### **Site Visits**

As noted previously, OAWP staff will follow up written surveys with selected site visits. This is in addition to the onsite completion of written surveys that were conducted or are pending for operations with the most NOIs. In the Suwannee River Basin and the Lake Okeechobee Watershed, site inspections are the primary means for BMP implementation assurance, and will continue to be so, as long as resources allow.

**Future Steps:** OAWP staff will:

1. Complete survey-based site visits for the Ridge and Indian River Citrus programs.
2. Develop a protocol for selecting sites for post-survey site visits; conducting, documenting, and ranking post-survey site visits; and following up post-survey site visits, as needed.
3. Include in the site-visit protocol a review of records and record keeping by producers; and observation/discussion of on-the-ground management practices that demonstrate adherence to BMPs.

### **Standardization of Procedures and Integration of Data**

To date, OAWP implementation assurance efforts have been driven by and tailored to regional priorities, and related data has been kept locally. Evaluation procedures also vary by region, but contain common elements. OAWP staff observed that the site inspection forms for the Suwannee River Basin and the Lake Okeechobee Watershed have some substantive and formatting weaknesses that need to be addressed to increase ease of use and clarity of results.

While implementation assurance will continue to be suited to program-specific needs and circumstances, OAWP recognizes that survey, inspection, and evaluation procedures should be standardized where feasible, and information collected on BMP implementation must be organized, stored, and made available in a common, statewide database.

**Future Steps:** OAWP staff will:

1. Review region-specific implementation assurance procedures and forms to make improvements, and standardize them to the extent practicable.
2. Develop a single OAWP database to track implementation assurance evaluations (including surveys, site visits, and any other mechanisms used) and resulting data from all areas of the state. Staff also will identify key data elements and ensure that these elements are tracked and recorded.

### **SUWANNEE RIVER BASIN - OBSERVATIONS AND FUTURE STEPS**

Agricultural BMP implementation in the Suwannee River Basin is a key part of the Suwannee River Partnership's strategy to protect and improve water quality. BMPs will be an important factor in complying with upcoming TMDLs in the Suwannee and Santa

Fe rivers. Currently, there are no FDACS rule-adopted BMP programs for animal operations, though most of them are required to have point source permits from FDEP and most have NRCS Conservation Plans. While agricultural BMP implementation is strong in this basin, several animal operations are still not participating. There is also a significant amount of vegetable/row crop acreage that is not yet enrolled in the related FDACS statewide BMP manual.

BMP Implementation Assurance (“Quality Assurance” in this basin) site inspections in the Suwannee River Basin denote that compliance ratings across most categories are high, but record keeping is a weakness. However, ratings for record keeping are skewed by the fact that if a producer is not available at the time of an unscheduled visit to provide records for review, the inspector gives a rating of *Conditional Satisfactory* in the records category.

**Future Steps:** In support of SRP objectives related to agricultural BMP implementation OAWP and SRP staff will work to:

1. Implement all BMP programs applicable within the Suwannee River Water Management District to the greatest extent practicable, targeting increased participation in the *Water Quality/Quantity BMPs for Vegetables and Agronomic Crops*. Staff will also work with producers to update existing plans, where needed.
2. Address any procedural weaknesses in the implementation assurance process.
3. Continue to conduct and follow up on implementation assurance site inspections for animal operations, at least once a year.
4. Conduct implementation assurance for vegetable and row crop producers, via statewide survey and targeted site visits.
5. Effectively promote:
  - ✓ Operation and maintenance of BMPs
  - ✓ BMP record keeping
  - ✓ Irrigation water management
6. Provide tools for Extension Agents to use in education and outreach.

In addition, OAWP is discussing with FDEP the possibility of adopting a statewide Conservation Plan rule, which would apply to specified categories of operations and identify required plan contents. If given initial verification by FDEP as effective in achieving pollutant reductions, the rule would serve to help certain producers meet the statutory conditions for a presumption of compliance with state water quality standards. This may provide the additional incentive needed for eligible producers in the Suwannee River Basin not yet participating in BMPs to do so. It would also be a mechanism for eligible producers in the basin and statewide to comply with applicable TMDLs.

#### ***LAKE OKEECHOBEE WATERSHED - OBSERVATIONS AND FUTURE STEPS***

The key issues with regard to BMP implementation in the Lake Okeechobee Watershed were completeness of BMP implementation and obtaining the required type of soil test. UF/IFAS is currently re-evaluating its recommendations with regard to appropriate types of soil testing. In some cases, record keeping was a weakness.

An increasing obstacle to BMP implementation is the rising cost of installing structural BMPs. On the state level, funding assistance for BMP implementation is and will continue to be more limited than it was in the past. Adding to the fiscal need is state legislation passed in 2007 that expands the former Lake Okeechobee Protection Act (LOPA) to include the Caloosahatchee and St. Lucie river watersheds, and re-names it the Northern Everglades and Estuaries Protection Program (NEEPP). The NEEPP mandates the expedited implementation of nonpoint source BMPs in the incorporated watersheds, consistent with the Lake Okeechobee Watershed Phosphorus Control Program, which was part of the original LOPA.

**Future Steps:** OAWP staff will:

1. Continue to visit each operation enrolled in the Lake Okeechobee Watershed Program, as plan implementation is completed. Approximately 75 sites are targeted for inspection between June 2008 and May 2009.
2. Emphasize the necessity of record keeping, and assist producers in developing record-keeping systems, as needed.
3. Amend the Lake Okeechobee Rule (5M-3, F.A.C.) to incorporate the entire NEEP area and make appropriate revisions pursuant to the 2007 legislation. Changes to the rule may include expanding the types of acceptable soil tests producers can submit to comply with the BMPs.
4. Attempt to secure adequate cost-share funding for the installation of essential structural BMPs that are otherwise not affordable.

### ***RIDGE CITRUS - OBSERVATIONS AND FUTURE STEPS***

#### **Effectiveness and Implementation of the BMP**

Research being conducted by UF/IFAS through its Citrus Research and Education Center indicates that following the Ridge Citrus BMP reduces the amount of nitrate reaching ground water. Because of the amount and results of monitoring data, it is the first BMP being considered by FDEP for the second stage of effectiveness verification ("confirmatory" verification). Given its unique status, implementation of the Ridge Citrus BMP is a high priority for OAWP.

In the years immediately following FDACS' adoption of the Ridge Citrus BMP (2002-2006), the bulk of citrus acres now in the in the program were enrolled. In the past two fiscal years, NOIs for about 2,500 additional acres have been submitted (out of a current adjusted BMPTS total of 107,215). While potential Ridge Citrus acres have decreased since 2002, due to economic and other forces, there are a significant number of operations still in production that have not enrolled in the BMP program.

**Future Steps:** The OAWP has contracted with UF/IFAS to (among other things) reinvigorate efforts in fiscal year 2008-09 to enroll citrus producers, with particular emphasis on Ridge Citrus producers, through BMP implementation team support.

#### **Complexity of the Ridge Citrus BMP**

The Ridge Citrus BMP is the only BMP that specifically prescribes the rate and timing of fertilizer applications, addressing various age blocks, season, fertigation, broadcast applications, high-producing blocks, and citrus types. This complexity can make

adherence to the BMP difficult under site-specific circumstances. For example, a number of producers cannot calibrate their spreaders down to the maximum *Wet Season* application rate of 40 lbs N/acre with the formulations they normally use. As a result, many omit *Wet Season* applications altogether, using their equipment for other purposes and avoiding the expense. Producers not as attuned to the BMP, and particularly this seasonal variation, may inadvertently exceed the BMP rate.

**Future Steps:** Approaches that OAWP staff will explore to address this situation are:

**1. Education**

- a. Raise general awareness of the dates of the specified *Wet Season* (June 15 – September 15). For example, ask producer associations to remind growers, starting in March of each year, of the difference between the Dry Season application rate of 65 lbs N/acre and the *Wet Season* rate of 40 lbs N/acre total. This should reduce the number of producers that inadvertently exceed the BMP rate during this timeframe.
- b. Conduct educational workshops and develop materials on implementation of the BMP.

**2. Technical Assistance - Work with producers that need to make *Wet Season* applications, to change their formulations to meet the calibration requirements of their spreading equipment. This would only be necessary where re-calibration to apply the *Wet Season* rate is needed but not feasible.**

**3. BMP Revision**

- a. Possibly modify the BMP to make it more similar to other citrus BMPs, allowing flexibility in how to accomplish the intended result. For instance, rather than set a strict application rate, which may not be appropriate under all circumstances, state the BMP in terms of avoiding high-risk applications (e.g., before forecasted rain events, prior to the last frost, during the rainy season). This could be addressed during the development of a statewide citrus BMP manual, in consultation with citrus growers and representatives.
- b. The Ridge Citrus BMP references 1995 UF/IFAS publication SP-169, *Nutrition of Florida Citrus Trees*, as a guidance document for Florida citrus fertilization. This publication recently was replaced by the January 2008 publication, SL253, *Nutrition of Florida Citrus Trees, 2<sup>nd</sup> Edition*. Any revisions to the BMP should include the use of this updated publication.

**INDIAN RIVER CITRUS - OBSERVATIONS AND FUTURE STEPS**

**BMP Implementation**

In contrast to the Ridge Citrus BMP, the IRC BMP program provides multiple BMPs, from which the producer chooses the practices applicable to the operation (necessary and feasible to implement). This accommodates the diversity of operation sizes and circumstances, and gives them ownership of the BMPs. If a practice does not make sense for a particular operation the producer need not select it. However, a BMP not originally identified on an NOI may still end up being implemented.

The IRC survey revealed that a number of practices that were not specifically selected by producers as being applicable or feasible were in fact being conducted as part of the day-to-day management of the operations. For example, only 73.81% of the responders to the survey indicated that they had selected practice A6 - *Drainage Management Plan* - on their NOIs, but their responses to questions about related management actions indicated that 90.48% of the responders carried out the intent of this particular practice. This means that the number of responders actually following this practice was 122.59% of what would be expected based on their NOIs. Similar responses were noted for practices A7 - *Drainage Rate and Volume*, A8 - *Discharge Structures*, and A9 - *Detention*.

Overall, implementation of the IRC nutrient management BMPs, as shown by the survey, is relatively consistent with NOI indications, with a few exceptions. With regard to BMP D8 - *Fertilizer Storage*, 76.19% of the responders indicated that they selected this on their NOIs. In reality, every producer that has ever had a delivery of fertilizer to an operation stores that fertilizer, whether for a few hours or a few days. When asked the management action questions about how they handled fertilizers onsite prior to application, 100% acknowledged that they took precautions to prevent contamination of nearby ground and surface waters, and that they kept the fertilizers covered and protected from rainfall. Therefore, this response shows a 131.25% ratio of what was indicated by the producers as being selected, to what they were actually doing.

For nutrient management BMP D9 - *Spilled Fertilizers*, 97.62% of the responders indicated that they selected this practice to *immediately remove any spilled fertilizers and apply them to crops at recommended rates*. However, the related management action question on the survey only addressed the use of spill containment systems and ground tarps (two effective ways of retaining spilled materials). Possibly due to the constraints of the question, only 78.57% of the responders indicated using spill containment systems. This does not mean that the others are not meeting the BMP, only that it was not confirmed by the survey. Similarly, the management action question related to D18 - *Use Appropriate Sources and Formulations* - was of limited use in confirming adherence to the BMP in that it only asked about the use of controlled-release products. While these products can be beneficial, they are not the only means of meeting the BMP. Even so, 82.93% of the responders were utilizing some controlled-release or slow-release fertilizers on their operations.

Only 64% of the responders indicated they had selected BMP D16 - *Incorporate Organic Materials*, and only about 55% actually used it (as presented by the survey question), with 45% indicating they had fully implemented the BMP. About 17% considered it not feasible, and 19% not applicable. Incorporating organic materials and mulches appears to be a beneficial BMP, as it can enhance soil moisture and nutrient levels. However its use is limited by practical and economic considerations, such as the availability and cost of appropriate materials.

#### **Future Steps:**

1. OAWP staff will work with stakeholders to determine the need for revision and/or clarification of practices in the Indian River Citrus BMP manual; and

2. Will revise the BMPs as needed, possibly as part of the development of a statewide citrus manual.

### Reference Questions

The Indian River Citrus survey included the following general questions (31-33 on the survey) relevant to understanding and documenting BMP implementation:

31. *Do you maintain records on the implementation of the Indian River Citrus BMPs as identified on the Notice of Intent submitted for this operation?*
32. *Do you have a copy of the Indian River Citrus BMP manual?*
33. *Did you find the manual helpful to you in implementing the BMPs?*

The intent of these questions was to provide a rudimentary level of feedback to OAWP staff regarding record keeping practices and the use/usefulness of the manual.

- About 80% of the responders indicated that they maintained records. According to the IRC rule (5M-2, F.A.C.), participants must “preserve sufficient documentation to confirm implementation” of the BMPs identified in the NOI. If the question had been worded this way, the percentage of “Yes” responses may have been even lower. Because records are an integral portion of the BMP programs, the fact that significantly fewer than 100% of the producers responding keep records indicates the need for added emphasis and guidance on this requirement.
- About 93% responded that they had a copy of the BMP manual available. This is a better response and a relatively simple deficiency to address.
- As to whether the manual was helpful in implementing the BMPs, about 95% responded that it was. The degree to which it was or is helpful needs further exploration. In general, the manual appears to need updating, restructuring, and clarification.

**Future Steps:** OAWP staff will:

1. Send a hard copy of the manual to producers who indicated they did not have a copy, and make them aware that all of the BMP manuals to date are available online at [www.floridaagwaterpolicy.com](http://www.floridaagwaterpolicy.com).
2. Further investigate and enhance the usefulness of the IRC manual as part of the review and revision process.

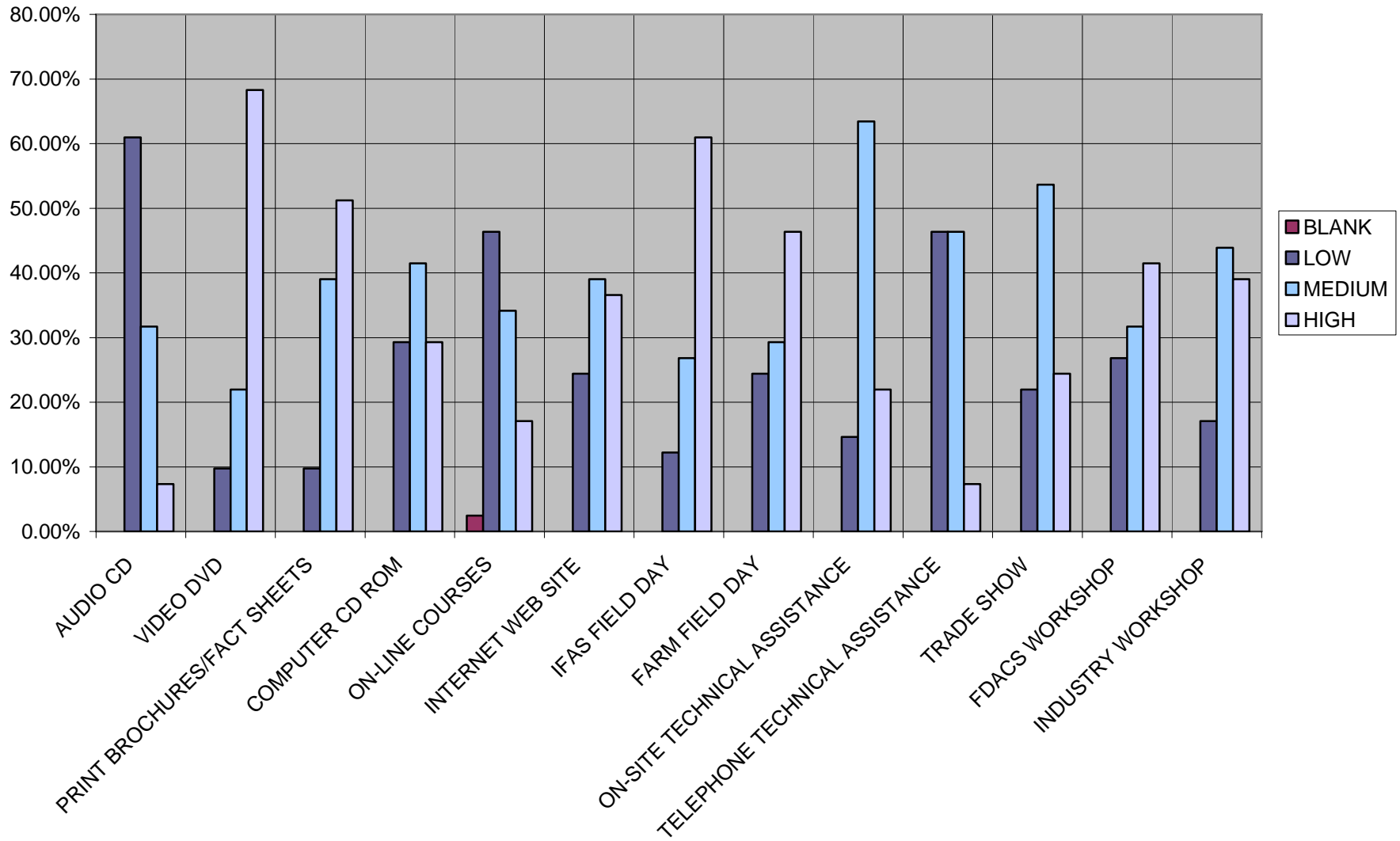
### Preferences for Educational and Technical Assistance

The last question on the IRC survey dealt with preferences for how to receive educational and technical assistance, and asked for a low/medium/high ranking of listed methods. **Figure 11** presents the results of this ranking.

**Future Steps:** OAWP staff will:

1. Consider this information in developing materials and mechanisms for producer education and assistance in BMP implementation.
2. Review this part of the survey to evaluate whether it needs to be revised to provide more targeted feedback.

**Figure 11. Indicated Preferences for Additional Assistance in BMP Implementation**



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## APPENDIX 1

### SUWANNEE RIVER PARTNERSHIP QUALITY ASSURANCE\* REVIEW FORMS

*\*Quality Assurance is the term used for BMP Implementation Assurance in this basin.*

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## Suwannee River Partnership Poultry Grower Environmental BMP Quality Assurance Check

Name of Grower: \_\_\_\_\_ County \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Type of Operation: Broiler, Pullet, Layer, Other  
 Written Plan: NRCS, Industry (Gold Kist)  
 Plan Start Date \_\_\_\_\_ Currently Following \_\_\_\_\_  
 Average farm capacity per grow-out(# of Birds): \_\_\_\_\_ Number of houses: \_\_\_\_\_  
 Average # of flocks per year: \_\_\_\_\_ Average grow-out weight of birds: \_\_\_\_\_

### Litter Management

**Method of litter disposal or usage:**  Application on owner's land: % \_\_\_\_\_  Animal feed: % \_\_\_\_\_  
 Application on 3<sup>rd</sup> party lands: Location/Name/% \_\_\_\_\_  Compost: % \_\_\_\_\_  
 Broker: % \_\_\_\_\_  Other: % \_\_\_\_\_

**Method of Litter Storage:**  Storage Facility \_\_\_\_\_%  On Ground Under Plastic \_\_\_\_\_%  Uncovered mounds \_\_\_\_\_%  
 Application of litter to fields (without storage) \_\_\_\_\_% Last date manure spreader calibrated? \_\_\_\_\_  
 Clean out schedule (frequency of clean outs): \_\_\_\_\_ Tons of litter per clean out: \_\_\_\_\_  
 Most recent litter analysis: Date: \_\_\_\_\_

#### Visual inspection:

- Satisfactory
- Conditional Satisfactory - (see comments)
- Unsatisfactory (see comments)

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### Records:

- Satisfactory
- Conditional Satisfactory - (see comments)
- Unsatisfactory (see comments)

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Mortality Management

#### Method of Disposal:

Average # of dead birds per day per grow-out? \_\_\_\_\_

#### Visual inspection:

- Satisfactory
- Conditional Satisfactory - (see comments)
- Unsatisfactory (see comments)

#### Comments:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Recommendations:** \_\_\_\_\_

**Referral to technician:** \_\_\_\_\_

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Grower: \_\_\_\_\_

Copy to ADC (White), SWCD (Green), Grower (Canary), Inspector (Pink)

Date of Evaluation \_\_\_\_\_

### Suwannee River Partnership Dairy Farmer BMP Quality Assurance Review

Technician's use only  
Follow-up Review \_\_\_\_\_  
Date of Initial Review \_\_\_\_\_

#### General Information

Dairy \_\_\_\_\_ FDACS I.D. # \_\_\_\_\_ Owner \_\_\_\_\_  
Address \_\_\_\_\_ County \_\_\_\_\_  
Plan Developed \_\_\_\_\_ Implementation Status of Plan (On Schedule) Yes No Complete  
Cows Milking \_\_\_\_\_ Dry \_\_\_\_\_ Heifers \_\_\_\_\_ Number of cows system is designed to handle \_\_\_\_\_

**Deficiencies:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Comments:** \_\_\_\_\_  
\_\_\_\_\_

#### 1. Nutrient Management Record Keeping

- a. Records kept:
  - i. nutrients applied for each field? **Y N**
  - ii. type of crops grown in each field? **Y N**
  - iii. crop yields? **Y N**
  - iv. rainfall levels? **Y N**
- b. Analysis in last year:
  - i. manure? **Y N**
  - ii. soil? **Y N**
- c. Are Nutrients applied to crop fields as recommended? **Y N N/E**

Section Evaluation (circle one) :  
S CS U

#### Manure Management Evaluation to determine if BMPs are being maintained and operated as required in their Conservation Plan

#### 2. Collection and Transport of Manure

- a) Are wastewater pipes and/or concrete structures being maintained properly to prevent spills/overflows? **Y N**
- b) Are large muddy or High Intensity Areas being prevented? If there are HIA's, indicate location and size (i.e. around gates, water troughs, feed troughs) **Y N**
- c) Is sand trap and/or solids separator cleaned/maintained? **Y N N/A**
- d) Is solids drying pad maintained? **Y N N/A**

Section Evaluation (circle one) :  
S CS U

#### 3. Storage of Manure

- a) Is an adequate wastewater level being maintained in the waste storage pond (enough storage for a 25 year/24 hour storm)? Freeboard \_\_\_\_\_ ft. **Y N**
- b) Is the waste storage pond being cleaned routinely as required? **Y N**
- c) Are manure spills and/or leaks prevented? **Y N**

Section Evaluation (circle one) :  
S CS U

#### 4. Utilization of Manure Liquid Application

- a) Have irrigation system(s) been evaluated for efficiency? **Y N**
- b) Is the irrigation system being moved within the field and/or other fields as required? **Y N**
- c) Are nozzles clear and being maintained as required? **Y N**
- d) Is wastewater being applied on a growing crop? **Y N**
- e) Are system leaks repaired in a timely manner? **Y N**
- f) Is ponding prevented? **Y N**

#### Spread Solids

- a) Are solids being stored properly until spread? **Y N**
- b) Are solids being spread on a growing crop? **Y N**
- c) Has manure spreader been calibrated in the last year? **Y N N/A**
- d) **Are Sensitive Areas Being Protected?** (Sinkholes, wetlands, etc.) **Y N**

Section Evaluation (circle one) :  
S CS U

#### OVERALL EVALUATION (CIRCLE ONE):

**SATISFACTORY**  
**CONDITIONAL SATISFACTORY**  
**UNSATISFACTORY**

Dairy Signature \_\_\_\_\_  
Print Name: \_\_\_\_\_

DACS/SRP Signature \_\_\_\_\_  
Print Name: \_\_\_\_\_

Key: S= Satisfactory CS = Conditional Satisfactory U = Unsatisfactory

APPENDIX 2  
LAKE OKEECHOBEE  
QUALITY ASSURANCE\* REVIEW FORM

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**GENERAL INFORMATION**

Facility Name/ID#: \_\_\_\_\_  
Facility Location: \_\_\_\_\_  
Type(s) of Agricultural Operation: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
County: \_\_\_\_\_  
Basin: \_\_\_\_\_  
Owner and Phone Number: \_\_\_\_\_  
On-site Representative's Name and Phone #: \_\_\_\_\_  
Date of Assessment: \_\_\_\_\_ Time: \_\_\_\_\_  
Assessment by: \_\_\_\_\_ Accompanied by: \_\_\_\_\_

**FACILITY OPERATION INFORMATION**

Are all implemented Best Management Practices within this facility operated and maintained according to the applicable NRCS Conservation Practice Standard and/or the site specific conservation plan?

Yes \_\_\_ No \_\_\_ Needs Improvement \_\_\_  
(See attached physical and management BMP inspection checklists)

Is the Nutrient Management Component of the site specific conservation plan fully implemented with all applicable records kept?

Yes \_\_\_ No \_\_\_ Needs Improvement \_\_\_  
(See attached Nutrient Management Checklist)

Have there been any changes to operations size and or parcels included in operation? \_\_\_\_\_  
If yes describe parcel and acreage changes. \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Overall BMP Assessment:**

Satisfactory \_\_\_ Unsatisfactory \_\_\_ Needs Improvement \_\_\_

Reassessment needed Yes \_\_\_ No \_\_\_ Date of Reassessment \_\_\_\_\_

Recommend to CARES Program Yes \_\_\_ No \_\_\_

*\*Quality Assurance is the term used for BMP Implementation Assurance in this basin.*

# BMP CHECKLIST

## MANAGEMENT BMPS

NOI BMP #	NRCS CPS #	GPS Coordinates *	Photo #	O&M Satisfactory?		
				Yes	No	Needs Improvement

## PHYSICAL BMPS

NOI BMP #	NRCS CPS #	GPS Coordinates *	Photo #	O&M Satisfactory?		
				Yes	No	Needs Improvement

\* Note: Used for culverts or other structural BMPs that receive a rating of "Needs Improvement" or "Unsatisfactory"

## NUTRIENT MANAGEMENT:

Have applicable core nutrient management BMPs been implemented according to the schedule indicated in the NOI? Yes \_\_\_ No \_\_\_

Are there circumstances to be considered such as educational needs, natural disasters, or other considerations? Yes \_\_\_ No \_\_\_ If yes, the circumstances are:

Are records adequate for the applicable BMPs designated on the NOI?  
Yes \_\_\_ No \_\_\_

If no, what are the specific inadequacies to be addressed?

**Needs:**

## IRRIGATION MANAGEMENT: N/A? Y N

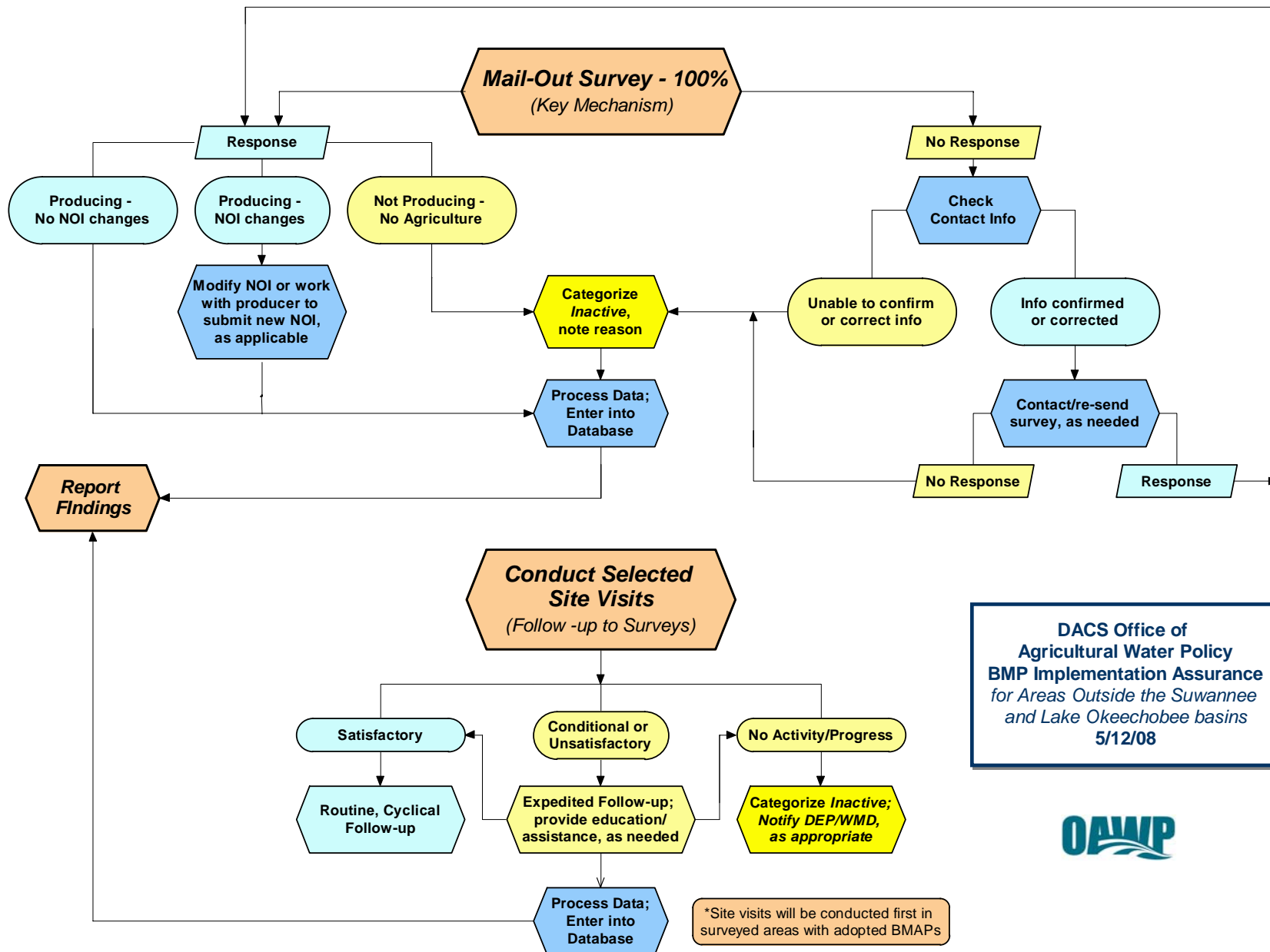
Have applicable core irrigation management BMPs been implemented according to the schedule indicated on the NOI? Yes \_\_\_ No \_\_\_

Are there circumstances to be considered such as educational needs, natural disasters, or other considerations? Yes \_\_\_ No \_\_\_ If yes, the circumstances are: \_\_\_\_\_

Are records adequate for the applicable BMPs designated on the NOI?  
Yes \_\_\_ No \_\_\_ If no, what are the specific inadequacies to be addressed?

**Needs:** \_\_\_\_\_

# APPENDIX 3



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## APPENDIX 4

### RIDGE CITRUS BMP IMPLEMENTATION SURVEY

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Florida Department of Agriculture and Consumer Services  
CHARLES H. BRONSON, Commissioner  
The Capitol • Tallahassee, FL 32399-0800  
www.doacs.state.fl.us

Office of Agricultural Water Policy  
1203 Governors Square Blvd.  
Suite 200, Mail Stop GS-50  
Tallahassee, FL 32301  
Telephone: (850) 617-1700

September 7, 2007

Contact Name  
Contact Address Line 1  
Contact Address Line 2

Contact Name:

Thank you for participating in the Florida Ridge Citrus Nitrogen Best Management Practice (BMP) program. Your implementation of the Ridge Citrus BMP is important to protecting Florida's water resources, and by law affords you a presumption of compliance with state water quality standards with regard to nitrogen. Florida Department of Agriculture and Consumer Services rule 5E-1.023(4)(b), Florida Administrative Code, requires that, as part of BMP implementation, you keep accurate records of fertilizer applications.

Enclosed is a three-page survey regarding Ridge Citrus BMP implementation, which is being given to everyone currently enrolled in the program. In addition, we have enclosed an information update sheet for each Notice of Intent to implement the BMP that lists you as the authorized contact. **We are asking you to complete and return these forms by, October 15, 2007, for the following reasons:**

- So that we may determine whether you are still an active participant in the BMP program.
- To ensure our records are up to date, so we can accurately report program enrollment rates and can reliably provide you with program updates and information.
- To collect information on producer implementation of the BMP, so we can identify issues that need to be addressed and determine what additional assistance you might need.
- To help measure the success of FDACS BMP programs – This is particularly important to maintaining legislative, agency, and public support for this incentive-based approach to reducing agricultural impacts to water resources.

**We very much need your responses in order to ensure successful implementation of the Ridge Citrus BMP program.** Please read and follow the enclosed survey instructions closely. If you have any questions regarding the survey or the BMP, contact Mark P. Mealo at (863) 519-8472, or by e-mail at [mealom@doacs.state.fl.us](mailto:mealom@doacs.state.fl.us).

Again, thank you for your participation in the BMP program, and for your cooperation in this survey.

Sincerely,

Richard J. Budell  
Office of Agricultural Water Policy

Enclosures



Florida Agriculture and Forest Products  
\$87 Billion for Florida's Economy

## RIDGE CITRUS BMP PARTICIPATION SURVEY INSTRUCTIONS

### PACKAGE CONTENTS

- **NOI Data Update Sheet:** One for each NOI that lists you as the Authorized Contact
- **Ridge Citrus BMP Participation Survey:** One

### PURPOSE

The Ridge Citrus Best Management Practices Program has been in effect since 1996. Many of the operations and acreages listed in the DACS BMP system have changed ownership or use. Consequently, we need to update these listings to maintain accurate information on BMP implementation and to continue to provide assistance to you.

### INSTRUCTIONS

The Data Update Sheet(s) and the Participation Survey may be completed in either pen or pencil. However, the signature must be in ink.

#### A. Completing the Data Update Sheet(s):

- In each NOI data update sheet you received, please print neatly all needed corrections in the boxes provided to the right. If no correction is needed for a particular line, leave the corresponding box blank.
- For the Yes / No response sections, please fully darken the corresponding bubble.

Like this: ● Not like this: ✓ ✗ /

#### B. Completing the Ridge Citrus BMP Participation Survey:

Though you may have more than one NOI under the Ridge Citrus BMP program, there is only one survey in the package. Your survey responses will reflect how the Ridge Citrus BMP is being implemented overall in the operations under your control or management.

- Base your responses on records for the 2006 calendar year only.
- Please select blocks representing the age groups identified in the BMP (1 to 3 years, 4 to 7 years, and 7 years and older).
- Wherever possible, select blocks of uniform age. The responses should be an accurate reflection of the records maintained for the selected blocks.
- Please fully darken the bubbles that indicate your responses.

Like this: ● Not like this: ✓ ✗ /

#### C. Submitting the Completed Forms:

If you have any questions regarding these forms or the BMP program, please contact Mark P. Mealo at (863) 519-8472, or by e-mail at [mealom@doacs.state.fl.us](mailto:mealom@doacs.state.fl.us). **Place your completed forms in the enclosed envelope, and mail them, by October 15, to:**

Mark P. Mealo  
Florida Department of Agriculture and Consumer Services  
Office of Agricultural Water Policy  
1203 Governor's Square Blvd.  
Suite 200, Mail Stop GS-50  
Tallahassee, FL 32301

## Ridge Citrus BMP Data Update Sheet

NOI «NOI»

«CID»

Please look over this information carefully.

Neatly print any needed corrections in the box below.

Notice of Intent # : ▶	
Operation Name: ▶	
Owner / Leasee Name: ▶	
Owner / Leasee Address: ▶	
City, State, ZIP: ▶	
Contact Name: ▶	
Contact Address: ▶	
City, State, ZIP: ▶	
Contact e-mail: ▶	
Contact Telephone: ▶	
Acres Enrolled: ▶	Current Production Acreage:

For the above listed acreage, please answer the following questions:

YES NO

- Is the above information correct (or corrected in the area provided)?
  YES
 NO
- Is this acreage still under your control / management?
  YES
 NO
- Is the Ridge Citrus BMP still utilized on this acreage?
  YES
 NO
- Would you like to continue the participation of this acreage in the Ridge Citrus BMP?
  YES
 NO
- Is additional help needed to understand and/or implement this BMP at this site?
  YES
 NO

I certify that all the information provided is accurate.

\_\_\_\_\_  
Land Owner, Leaseholder, or Authorized  
Representative (*Please print*)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Failure to return package by October 15, 2007, may result in NOI being listed as INACTIVE.



NOI «NOI»



## Ridge Citrus BMP Participation Survey

**Instructions**

From your records for the 2006 calendar year, select a block representing each of the age groups identified in the Ridge Citrus BMP (1 to 3 years, 4 to 7 years, and 7 years and older). Try to select blocks with trees of uniform age.

Please fully darken the applicable circles Like this: ● Not like this: ✓ ✗ /

**For a block of 1 to 3 year old trees** Block ID \_\_\_\_\_ Planting Date \_\_\_\_\_

1. What is the age of the trees in the selected block? **1 year**      **2 years**      **3 years**      **N/A**  
 (If you have no blocks in this age category mark N/A, and go to the next section.)
- 

**For 1 to 3 year-old trees, the Ridge Citrus BMP provides the following:**

The maximum N <b>BROADCAST</b> Application Rate for: <ul style="list-style-type: none"> <li>1-year-old trees is 0.05 lbs. N/tree/application</li> <li>2-year-old trees is 0.12 lbs. N/tree/application</li> <li>3-year-old trees is 0.225 lbs. N/tree/application</li> </ul>	The maximum N <b>FERTIGATION</b> Application Rate for: <ul style="list-style-type: none"> <li>1-year-old trees is 0.03 lbs. N/tree/application</li> <li>2-year-old trees is 0.06 lbs. N/tree/application</li> <li>3-year-old trees is 0.09 lbs. N/tree/application</li> </ul>
The maximum <b>TOTAL ANNUAL</b> N rate for: <ul style="list-style-type: none"> <li>1-year-old trees is 0.30 lbs. N/tree/year applied as a minimum of 6 broadcast, or 10 fertigation events</li> <li>2-year-old trees is 0.60 lbs. N/tree/year applied as a minimum of 5 broadcast, or 10 fertigation events</li> <li>3-year-old trees is 0.90 lbs. N/tree/year applied as a minimum of 4 broadcast, or 10 fertigation events</li> </ul>	

**From your records for the selected block of 1 to 3 year old trees, please answer the following:**

- |  |                        |                        |                        |                       |
|--|------------------------|------------------------|------------------------|-----------------------|
|  | <b>YES</b>             | <b>NO</b>              |                        |                       |
| 2. Were all applications during 2006 within BMP rates?                         | <input type="radio"/>  | <input type="radio"/>  |                        |                       |
| 3. What was the total annual N rate (lbs. N/tree/year) on this block for 2006? |                        |                        |                        |                       |
| <b>&lt; 0.3 lbs.</b>   | <b>0.3 to 0.5 lbs.</b> | <b>0.5 to 0.6 lbs.</b> | <b>0.6 to 0.9 lbs.</b> | <b>&gt; 0.9 lbs.</b>  |
| <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/> |

**Failure to return package by October 15, 2007 may result in NOI being listed as INACTIVE.**

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page 1

## Ridge Citrus BMP Participation Survey

For a block of 4 to 7 year old trees

Block ID \_\_\_\_\_ Planting Date \_\_\_\_\_

4. What is the age of the trees in the selected block? (If you have no blocks in this age category mark N/A, and go to the next section.)
- |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>4 years</b>        | <b>5 years</b>        | <b>6 years</b>        | <b>N/A</b>            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**For 4 to 7 year-old trees, the Ridge Citrus BMP provides the following:**

- The maximum **DRY SEASON** lbs. N/acre/application is 65 lbs. N for broadcast applications, or 15 lbs. N by fertigation
- The maximum **WET SEASON** lbs. N/acre/application is 40 lbs. N for broadcast applications, or 10 lbs. N by fertigation
- The maximum **TOTAL ANNUAL** lbs. N/acre is 200 lbs. N/acre
- The maximum **TOTAL WET SEASON** lbs. N/acre is 40 lbs. N/acre as a minimum of 1 broadcast or 4 fertigation events

**From your records for the selected block of 4 to 7 year old trees, please answer the following:**

- |  | YES                    | NO                     |                        |                        |                      |                       |                       |                       |                       |                       |  |  |
|--|------------------------|------------------------|------------------------|------------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|--|
| 5. Were all applications during 2006 within BMP rates?   | <input type="radio"/>  | <input type="radio"/>  |                        |                        |                      |                       |                       |                       |                       |                       |  |  |
| 6. Was the total <b>WET SEASON</b> N/acre for 2006 below 40 lbs. N/acre?   | <input type="radio"/>  | <input type="radio"/>  |                        |                        |                      |                       |                       |                       |                       |                       |  |  |
| 7. Was the 4-year (2003- 2006) average N/acre below 200 lbs. N/acre/year?  | <input type="radio"/>  | <input type="radio"/>  |                        |                        |                      |                       |                       |                       |                       |                       |  |  |
| 8. What was the total annual N rate (lbs. N/acre/year) on this block for 2006?   |                        |                        |                        |                        |                      |                       |                       |                       |                       |                       |  |  |
| <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><b>&lt; 180 lbs.</b></td> <td style="text-align: center;"><b>181 to 200 lbs.</b></td> <td style="text-align: center;"><b>201 to 220 lbs.</b></td> <td style="text-align: center;"><b>221 to 240 lbs.</b></td> <td style="text-align: center;"><b>&gt; 240 lbs.</b></td> </tr> <tr> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> </tr> </table> | <b>&lt; 180 lbs.</b>   | <b>181 to 200 lbs.</b> | <b>201 to 220 lbs.</b> | <b>221 to 240 lbs.</b> | <b>&gt; 240 lbs.</b> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  |  |
| <b>&lt; 180 lbs.</b>   | <b>181 to 200 lbs.</b> | <b>201 to 220 lbs.</b> | <b>221 to 240 lbs.</b> | <b>&gt; 240 lbs.</b>   |                      |                       |                       |                       |                       |                       |  |  |
| <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |                      |                       |                       |                       |                       |                       |  |  |
| 9. What was the 4-year (2003- 2006) annual average of total lbs. N/acre?   |                        |                        |                        |                        |                      |                       |                       |                       |                       |                       |  |  |
| <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><b>&lt; 180 lbs.</b></td> <td style="text-align: center;"><b>180 to 190 lbs.</b></td> <td style="text-align: center;"><b>191 to 200 lbs.</b></td> <td style="text-align: center;"><b>201 to 210 lbs.</b></td> <td style="text-align: center;"><b>&gt; 210 lbs.</b></td> </tr> <tr> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> </tr> </table> | <b>&lt; 180 lbs.</b>   | <b>180 to 190 lbs.</b> | <b>191 to 200 lbs.</b> | <b>201 to 210 lbs.</b> | <b>&gt; 210 lbs.</b> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  |  |
| <b>&lt; 180 lbs.</b>   | <b>180 to 190 lbs.</b> | <b>191 to 200 lbs.</b> | <b>201 to 210 lbs.</b> | <b>&gt; 210 lbs.</b>   |                      |                       |                       |                       |                       |                       |  |  |
| <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |                      |                       |                       |                       |                       |                       |  |  |

**Failure to return package by October 15, 2007 may result in NOI being listed as INACTIVE.**



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page 2



## Ridge Citrus BMP Participation Survey

For a block of mature trees (7 years +)      Block ID \_\_\_\_\_ Planting Date \_\_\_\_\_

10. What type of citrus is being produced in this block? (If you have no blocks in this age category mark N/A.)

Early to Mid	Valencia	Mandarin	Grapefruit	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. What was the average production in boxes/acre for the previous 3 years (2003- 2005)?

< 500	500 to 599	600 to 699	700 to 799	> 800
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**For mature production trees 7+years, the Ridge Citrus BMP provides the following:**

- The maximum **DRY SEASON** lbs. N/acre/application is 65 lbs. N for broadcast applications, or 15 lbs. N by fertigation
- The maximum **WET SEASON** lbs. N/acre/application is 40 lbs. N for broadcast applications, or 10 lbs. N by fertigation
- The maximum **TOTAL ANNUAL** lbs. N/acre is 240 lbs. N/acre
- The maximum **TOTAL WET SEASON** lbs. N/acre is 40 lbs. N/acre as a minimum of 1 broadcast or 4 fertigation events

**From your records for the selected block of mature trees, please answer the following:**

	YES	NO										
12. Were all applications during 2006 within BMP rates?	<input type="radio"/>	<input type="radio"/>										
13. Was the total <b>WET SEASON</b> N/acre for 2006 below 40 lbs. N/acre?	<input type="radio"/>	<input type="radio"/>										
14. Was the 4-year (2003- 2006) average N/acre below 240 lbs. N/acre/year?	<input type="radio"/>	<input type="radio"/>										
15. What was the 4-year (2003- 2006) annual average of total lbs. N/acre?												
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">&lt; 240 lbs.</th> <th style="text-align: center;">240 to 250 lbs.</th> <th style="text-align: center;">251 to 260 lbs.</th> <th style="text-align: center;">261 to 270 lbs.</th> <th style="text-align: center;">&gt; 270 lbs.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> <td style="text-align: center;"><input type="radio"/></td> </tr> </tbody> </table>	< 240 lbs.	240 to 250 lbs.	251 to 260 lbs.	261 to 270 lbs.	> 270 lbs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
< 240 lbs.	240 to 250 lbs.	251 to 260 lbs.	261 to 270 lbs.	> 270 lbs.								
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								

**Failure to return package by October 15, 2007 may result in NOI being listed as INACTIVE.**



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page 3



## APPENDIX 5

### INDIAN RIVER CITRUS BMP IMPLEMENTATION SURVEY

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Florida Department of Agriculture and Consumer Services  
CHARLES H. BRONSON, Commissioner  
The Capitol • Tallahassee, FL 32399-0800  
www.doacs.state.fl.us

CID

Office of Agricultural Water Policy  
1203 Governors Square Blvd.  
Suite 200, Mail Stop GS-50  
Tallahassee, FL 32301  
Telephone: (850) 617-1700

November 19, 2007

Contact Name  
Contact Address Line 1  
Contact Address Line 2

Contact Name:

Thank you for participating in the Indian River Area Citrus Groves Best Management Practices (BMP) program. Your implementation of these BMPs is important to protecting Florida's water resources, and by law affords you a presumption of compliance with state water quality standards with regard to nitrogen and phosphorus. Florida Department of Agriculture and Consumer Services rule 5M-2, Florida Administrative Code, requires that, you keep sufficient documentation to confirm that you are implementing the BMPs identified on your Notice of Intent as submitted to the Department.

Enclosed is a four-page survey regarding Indian River Citrus BMP implementation, which is being given to everyone currently enrolled in the program. The survey itself should take about 15 minutes for you or your authorized representative to complete. In addition, we have enclosed an information update sheet for each Notice of Intent that lists you as the authorized contact. **We are asking you to complete and return these forms by, December 30, 2007, for the following reasons:**

- So that we may determine whether you are still an active participant in the BMP program.
- To ensure our records are up to date, so we can accurately report program enrollment rates and can reliably provide you with program updates and information.
- To collect information on producer implementation of key BMPs, so we can identify issues that need to be addressed and determine what additional assistance you and others might need.
- To help measure the success of FDACS BMP programs – This is particularly important to maintaining legislative, agency, and public support for this incentive-based approach to reducing agricultural impacts to water resources.

**We very much need your responses in order to ensure successful implementation of the Indian River Citrus BMP program.** Please read and follow the enclosed survey instructions closely. If you have any questions regarding the survey or the BMP program, contact Mark P. Mealo by e-mail at [mealom@doacs.state.fl.us](mailto:mealom@doacs.state.fl.us), or by telephone at (863) 519-8472.

Again, thank you for your participation in the BMP program, and for your cooperation in this survey.

Sincerely,

Richard J. Budell  
Office of Agricultural Water Policy

Enclosures



Florida Agriculture and Forest Products  
\$ 87 Billion for Florida's Economy

**INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY**  
**INSTRUCTIONS**

**OTHER PACKAGE CONTENTS**

- **BMP Summary Sheet:** Contains a brief summary of each BMP listed in the survey.  
(For more details, please refer to the May 2000 manual, *Water Quality/Quantity BMPs for Indian River Area Citrus Groves, along with the January 2005 updates.*)  
Both can be found at:  
<http://www.floridaagwaterpolicy.com/BestManagementPractices.html>
- **Indian River Citrus BMP Participation Survey:** One
- **NOI Data Update Sheet:** One for each Notice of Intent (NOI) that lists you as the Authorized Contact

**PURPOSE**

The Indian River Area Citrus Groves BMP Program has been in effect since 2000. Since then, many of the operations and acreages listed in the DACS BMP system have changed ownership or use. Consequently, we need to update these listings to maintain accurate information. In addition, we need to gather feedback on whether and how some of the key BMPs are being implemented, in order to improve BMP development, gauge water resource impacts, and enhance our efforts to assist you.

**INSTRUCTIONS**

- The Participation Survey and the Data Update Sheet(s) may be completed in either pen or pencil.
- **The signature must be in ink.**
- **Completely fill** each bubble with the applicable response- **Like this:** ● **Not like this:** ○ ⊗ ⊘

**A. Completing the Indian River Citrus BMP Participation Survey:**

Though you may have more than one NOI under the Indian River Citrus BMP program, there is only one survey in the package. Your responses will reflect how the Indian River Citrus BMPs listed in the survey are being implemented overall in the operations under your control or management. If a BMP listed in the survey was identified for implementation in at least one of your NOIs, it is applicable to you in responding to the survey.

**B. Completing the NOI Data Update Sheet(s):**

For each NOI data update sheet you received, please print neatly all needed corrections in the boxes provided to the right. If no correction is needed for a particular line, leave the corresponding box blank.

**C. Submitting the Completed Forms:**

If you have any questions regarding these forms or the BMP program, please contact Mark P. Mealo by e-mail at [mealom@doacs.state.fl.us](mailto:mealom@doacs.state.fl.us), or at (863) 519-8472. **Place your completed forms in the enclosed envelope, and mail them, by December 30, to:**

Mark P. Mealo  
Florida Department of Agriculture and Consumer Services  
Office of Agricultural Water Policy  
1203 Governor's Square Blvd.  
Suite 200, Mail Stop GS-50  
Tallahassee, FL 32301

November 2007

**INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY**  
**SUMMARY OF SELECTED BMPs**  
*(See Indian River Citrus BMP manual for more details.)*

- A1. **Water Table Management** - Water table control can be managed more efficiently by: having sufficient hydraulic capacity in the ditch/canal system, using water control structures on culverts, laser land leveling where appropriate, constructing/maintaining a properly designed drainage system, and actively monitoring the water table.
- A2. **Scheduling Irrigation and Drainage** - Drainage and irrigation schedules should focus on optimal crop production that encourages deep rooting by maintaining a water table that minimizes water quantity and quality impacts. Irrigation and drainage practices should be focused on maintaining a well-defined root zone that can be managed during drought and wet periods.
- A3. **Moderate Discharge Rate** - Adjust the rate of discharge proportionate to the rate of lateral movement of water through soils. This can lessen the turbulence, reduce sediment movement, reduce erosion, and moderate the impacts on the receiving water body.
- A4. **Water Furrow Maintenance** - Maintain a consistent bottom slope on water furrows between beds to achieve uniform drainage. Avoid rutting and sloughing of water furrow areas.
- A5. **Monitor Soil Moisture** - Use tensiometers and water table observation wells for irrigation and drainage management to avoid excess soil moisture depletion and minimize water volume requirements during irrigation cycles.
- A6. **Drainage Management Plan** - Implement and maintain a written drainage management plan that provides specific responses to various types and levels of rainfall. The goal of the plan should be a reduction in volume of off-site discharge while maintaining a healthy environment for citrus production. The plan should include target water table levels and pump or drainage structure operating procedures that will be used for typical and extreme rainfall events.
- A7. **Drainage Rate and Volume** - Drainage rates and the volume of water released or discharged following intense rainfall events should provide an adequately drained root zone while minimizing off-site impacts. When the water table approaches the target level, off-site discharges should be moderated.
- A8. **Discharge Structures** - Structures and/or pumps that regulate off-site water discharge should be adequately designed, constructed, and maintained to achieve target water table levels within the grove.
- A9. **Detention** - Where possible, on-site detention should be provided to reduce both the rate and volume of off-site discharges following heavy rains. Detention areas allow all or a portion of the drainage water to be temporarily stored on-site. The excess water can be stored for use or released later at low flow rates.
- D1. **Education** - Proper training of the field operators responsible for handling, loading, and operating fertilizer spreading equipment, and for correct maintenance of field equipment can help achieve desired placement of fertilizers, avoid waste, and prevent contamination of open waters. Reinforce training with checklists of critical operating points before application of materials.
- D2. **Nutrient Management** - Develop a nutrient management plan based on soil, water, plant and organic material sample analyses and expected crop yields. USDA-NRCS develops nutrient management plans, and requires them for practices that receive cost-share benefits.
- D3. **Employ Tissue and Soil Analyses** - Fertilizer applications based on these tests will help avoid over-fertilization and subsequent losses of nutrients in runoff water. Application of mobile elements such as N (nitrogen) and K (potassium) should be made on the basis of leaf tissue analysis and production levels instead of routine applications. Applications of less mobile elements such as Ca (calcium), Mg (magnesium), and P (phosphorus) should be based on soil testing and leaf analysis, instead of regular applications of specific amounts.

Continued on reverse

**INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY**  
**SUMMARY OF SELECTED BMPs**

*(See Indian River Citrus BMP manual for more details.)*

- 
- D4. **Use Appropriate Application Equipment** - Operate machinery as designed so as to achieve precise and desired placement of nutrient materials at specified rates consistent with the form and source of nutrient materials.
- D5. **Equipment Calibration and Maintenance** - Proper calibration and maintenance of fertilizer application equipment is essential to avoid misapplication of nutrients.
- 
- D6. **Apply Materials to Target Sites** - Place nutrients within the root zone of individual trees or drip-line bands along hedgerows of trees. Avoid placement in areas prone to off-site transport of nutrients, especially water furrows.
- D7. **Avoid High Risk Applications** - Do not apply materials under "high risk" situations, such as before forecasted rainfall. Avoid applications of nutrients during intense rainfall, on bare soils with extreme erosion potential, or when water tables are near the surface.
- 
- D8. **Fertilizer Storage** - Take precautions when storing fertilizer to prevent contamination of nearby ground and surface water. Always store fertilizer in an area that is protected from rainfall.
- D9. **Spilled Fertilizers** - Immediately remove any fertilizer materials spilled on ground surfaces and apply at recommended rates to crops. When possible, place a tarp over ground surfaces where fertilizer transfer operations are conducted. Spilled materials should be transferred to application equipment.
- 
- D10. **Use Caution When Loading Near Ditches, Canals, and Wells** - Minimize the potential for spilled materials to pollute surface waters. When possible, locate mixing and loading activities away from ground water wells, ditches, canals, and other areas where runoff may carry spilled fertilizer into surface water bodies. If such areas cannot be avoided, protect wells by properly casing and capping them and use berms to keep spills out of surface waters. Recover and apply spilled materials to intended zone of application.
- 
- D11. **Alternate Loading Operation Sites** - Use multiple fertilizer-loading and transfer sites to prevent concentration of nutrients in a single area.
- 
- D12. **Use Backflow Prevention Devices** - Use backflow prevention devices on irrigation and spray tank filling systems to preclude entry of nutrients into surface waters. Never leave a filling-tank unattended.
- 
- D13. **Split Applications Throughout Season** - Dividing the annual fertilizer requirement into two or more applications can minimize leaching during the summer rainy season and help maintain the supply of nutrients over the long growing season of Florida. Frequent fertigations can be an efficient method of application for N and K while minimizing the potential for leaching of nutrients during excessive rainfall events.
- 
- D14. **Erosion Control** - Erosion-control practices should be considered to minimize soil loss and runoff that can carry dissolved and attached nutrients on soil particles to surface waters. Vegetative filter strips are effective in reducing the levels of suspended solids and nutrients.
- 
- D15. **Irrigation Management** - Irrigation should be limited to wetting only the root zone where possible. Excessive irrigation can transport nutrients below the root zone through leaching. Proper scheduling and uniform water distribution are necessary to assure control.
- 
- D16. **Incorporate Organic Materials** - Increase the use of organic matter (i.e. mulch) when possible to retain nutrients, increase soil moisture retention, improve soil structure, and improve biological ecosystems.
- 
- D17. **Well Protection** - Prevent ground water contamination by decommissioning wells that are not in use.
- 
- D18. **Use Appropriate Sources and Formulations** - Reduce the potential for nutrient leaching and off-site movement by choosing appropriate sources and formulations of fertilizer based on nutritional needs, season (rainy vs. dry), and anticipated weather conditions to achieve greatest efficiency and reduce potential for offsite transport. Utilize controlled-release and slow-release formulations when feasible.
-

**INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY  
DATA UPDATE SHEET**

**NOI**

**CID**

Please look over this information carefully.

Neatly print any needed corrections in the box below.

Notice of Intent # : ▶	
Operation Name: ▶	
Owner / Lessee Name: ▶	
Owner / Lessee Address: ▶	
City, State, ZIP: ▶	
Contact Name: ▶	
Contact Address: ▶	
City, State, ZIP: ▶	
Contact e-mail: ▶	
Contact Telephone: ▶	
Acres Enrolled: ▶	Current Production Acreage:

For the above listed acreage, please answer the following questions:

**YES    NO**

- Is the above information correct (or corrected in the area provided)?
  YES     NO
- Is this acreage still under your control / management?
  YES     NO
- Are the Indian River Citrus BMPs still used on this acreage?
  YES     NO
- Would you like to continue the enrollment of this acreage in the BMP program?
  YES     NO
- Is additional help needed to understand and/or implement these BMPs at this site?
  YES     NO

I certify that all the information provided is accurate.

\_\_\_\_\_  
Land Owner, Leaseholder, or Authorized Representative (Please print)      Signature      Date

**IMPORTANT - Please complete and return by December 30, 2007.**

NOI #  


«PROGRAM»IRCDUS



# INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY

Instructions: **Completely fill** each bubble with the applicable response- Like this: ● Not like this: ○ ⊗ ⊘

Not Applicable (Practice was indicated as Not Applicable on Notice of Intent) ▼						
Economically Not Feasible (Practice was Not Implemented due to economic limitations) ▼						
Technically Not Feasible (Practice was Not Implemented due to technical limitations) ▼						
Partially Implemented (Practice has been Partially Implemented) ▼						
Fully Implemented (Practice has been Fully Implemented) ▼						
BMP	Brief Description <small>(Please see the <i>Indian River Citrus BMP manual</i> or the attached <i>BMP summary sheet</i> for additional details)</small>	F	P	T	E	N
A1.	<b>Water Table Management</b> (ditch/canals, control structures, active monitoring)	(F)	(P)	(T)	(E)	(N)
A2.	<b>Scheduling Irrigation and Drainage</b> (maintain water table that optimizes production)	(F)	(P)	(T)	(E)	(N)
A3.	<b>Moderate Discharge Rate</b> (limit off-site discharge to rate of lateral drainage)	(F)	(P)	(T)	(E)	(N)
A4.	<b>Water Furrow Maintenance</b> (to achieve uniform drainage)	(F)	(P)	(T)	(E)	(N)
A5.	<b>Monitor Soil Moisture</b> (to manage irrigation and drainage)	(F)	(P)	(T)	(E)	(N)
A6.	<b>Drainage Management Plan</b> (written drainage management plan)	(F)	(P)	(T)	(E)	(N)
A7.	<b>Drainage Rate and Volume</b> (to minimize off-site impacts)	(F)	(P)	(T)	(E)	(N)
A8.	<b>Discharge Structures</b> (safe, effective, easy to adjust to meet target levels)	(F)	(P)	(T)	(E)	(N)
A9.	<b>Detention</b> (sufficient onsite capacity)	(F)	(P)	(T)	(E)	(N)
D1.	<b>Education</b> (proper training of field operators)	(F)	(P)	(T)	(E)	(N)
D2.	<b>Nutrient Management</b> (written plan based on sample analyses and expected yields)	(F)	(P)	(T)	(E)	(N)
D3.	<b>Employ Tissue and Soil Analyses</b> (to avoid over-fertilization)	(F)	(P)	(T)	(E)	(N)
D4.	<b>Use Appropriate Application Equipment</b> (for precise, consistent applications)	(F)	(P)	(T)	(E)	(N)
D5.	<b>Equipment Calibration and Maintenance</b> (to avoid misapplication of nutrients)	(F)	(P)	(T)	(E)	(N)
D6.	<b>Apply Materials to Target Sites</b> (within root zone area or drip-line of trees)	(F)	(P)	(T)	(E)	(N)
D7.	<b>Avoid High Risk Applications</b> (when runoff or leaching is possible)	(F)	(P)	(T)	(E)	(N)
D8.	<b>Fertilizer Storage</b> (proper precautions taken if fertilizer is stored onsite)	(F)	(P)	(T)	(E)	(N)
D9.	<b>Spilled Fertilizers</b> (immediately removed from ground surface)	(F)	(P)	(T)	(E)	(N)
D10.	<b>Use Caution When Loading Near Ditches, Canals, and Wells</b> (fertilizer loading)	(F)	(P)	(T)	(E)	(N)
D11.	<b>Alternate Loading Operation Sites</b> (to prevent concentration of nutrients)	(F)	(P)	(T)	(E)	(N)
D12.	<b>Use Backflow Prevention Devices</b> (on irrigation and spray tank filling systems)	(F)	(P)	(T)	(E)	(N)
D13.	<b>Split Applications Throughout Season</b> (multiple applications during year)	(F)	(P)	(T)	(E)	(N)
D14.	<b>Erosion Control</b> (minimize soil and nutrient losses due to runoff)	(F)	(P)	(T)	(E)	(N)
D15.	<b>Irrigation Management</b> (proper scheduling and uniform water distribution)	(F)	(P)	(T)	(E)	(N)
D16.	<b>Incorporate Organic Materials</b> (as a means of soil amendment)	(F)	(P)	(T)	(E)	(N)
D17.	<b>Well Protection</b> (properly decommission inactive wells)	(F)	(P)	(T)	(E)	(N)
D18.	<b>Use Appropriate Sources and Formulations</b> (fertilizer sources and formulations)	(F)	(P)	(T)	(E)	(N)

**IMPORTANT - Please complete and return by December 30, 2007.**



## INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY

No		Yes	
		Y	N
1.	Indicate which of the following water table management practices your operations use:		
	a. Ditch/canal system with sufficient hydraulic capacity	<input type="radio"/>	<input type="radio"/>
	b. Water control structures on culverts	<input type="radio"/>	<input type="radio"/>
	c. A properly designed, constructed, and maintained drainage system	<input type="radio"/>	<input type="radio"/>
	d. Active water table monitoring	<input type="radio"/>	<input type="radio"/>
2.	Irrigation and drainage practices maintain a water table that minimizes water quantity and quality impacts.	<input type="radio"/>	<input type="radio"/>
3.	Rate of discharge is adjusted to the rate of lateral movement of water through your soils.	<input type="radio"/>	<input type="radio"/>
4.	A consistent slope is maintained on water furrows between beds to achieve uniform drainage.	<input type="radio"/>	<input type="radio"/>
5.	Soil moisture levels are regularly monitored using:		
	a. Tensiometers	<input type="radio"/>	<input type="radio"/>
	b. Water Table Observation Wells	<input type="radio"/>	<input type="radio"/>
	c. Electronic Soil Moisture Probes	<input type="radio"/>	<input type="radio"/>
6.	Are you implementing a written drainage management plan that provides specific responses to various levels of rainfall?	<input type="radio"/>	<input type="radio"/>
7.	Indicate which of the following your Drainage Management Plan contains:		
	a. target water table levels	<input type="radio"/>	<input type="radio"/>
	b. pump operating procedures based on rainfall events	<input type="radio"/>	<input type="radio"/>
	c. drainage structure operating procedures based on rainfall events	<input type="radio"/>	<input type="radio"/>
	d. use of existing canals and ditches for temporary water storage	<input type="radio"/>	<input type="radio"/>
8.	Drainage rates and volumes provide for an adequately drained root zone while minimizing off-site impacts.	<input type="radio"/>	<input type="radio"/>
9.	Discharge structures and/or pumps are adequately designed, constructed, and maintained to regulate off-site water discharges.	<input type="radio"/>	<input type="radio"/>
10.	Sites have sufficient on-site detention areas for temporarily storing water from heavy rain events for later use or for release at low flow rates.	<input type="radio"/>	<input type="radio"/>
11.	Employees are properly trained in nutrient handling and applications.	<input type="radio"/>	<input type="radio"/>
12.	Nutrient application training is reinforced by using checklists of critical operating details.	<input type="radio"/>	<input type="radio"/>
13.	Do you have nutrient management plan based on soil, water, plant and organic material sample analyses, and expected yields?	<input type="radio"/>	<input type="radio"/>
14.	Tissue and soil analyses are used to avoid over-fertilization.	<input type="radio"/>	<input type="radio"/>

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## INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY

		No	▼
		Yes	▼
		Y	N
15.	Application equipment is operated to achieve precise placement of nutrient materials at specified rates consistent with the form and source of nutrient materials.	<input type="radio"/>	<input type="radio"/>
16.	Fertilizer application equipment is properly maintained and calibrated to avoid misapplication of nutrients.	<input type="radio"/>	<input type="radio"/>
17.	Nutrient applications are placed within the root zone of individual trees, or within the drip-line band of hedge-rowed trees.	<input type="radio"/>	<input type="radio"/>
18.	Indicate when nutrient applications are avoided:		
	a. during intense rainfall	<input type="radio"/>	<input type="radio"/>
	b. before forecasted rainfall	<input type="radio"/>	<input type="radio"/>
	c. on bare soils with extreme erosion potential	<input type="radio"/>	<input type="radio"/>
	d. when water table is near the surface	<input type="radio"/>	<input type="radio"/>
19.	When storing fertilizers on site:		
	a. Do you take precautions to prevent contamination of nearby ground and surface water?	<input type="radio"/>	<input type="radio"/>
	b. Is stored fertilizer protected from rainfall?	<input type="radio"/>	<input type="radio"/>
20.	Spill containment systems/ground tarps are used when transferring fertilizers to application equipment.	<input type="radio"/>	<input type="radio"/>
21.	Do you use caution when loading fertilizer near ditches, canals, and wells?	<input type="radio"/>	<input type="radio"/>
22.	Do you alternate fertilizer loading operation areas?	<input type="radio"/>	<input type="radio"/>
23.	Do you use backflow prevention devices?	<input type="radio"/>	<input type="radio"/>
24.	Field operation personnel remain in attendance while filling tanks.	<input type="radio"/>	<input type="radio"/>
25.	Annual fertilizer requirements are divided into two or more applications.	<input type="radio"/>	<input type="radio"/>
26.	Do you use erosion control measures?	<input type="radio"/>	<input type="radio"/>
27.	Irrigation is focused on wetting only the root zone, where possible.	<input type="radio"/>	<input type="radio"/>
28.	Do you use organic materials and/or mulches?	<input type="radio"/>	<input type="radio"/>
29.	Have all wells <u>not in use</u> been decommissioned? (if all wells are in use answer yes)	<input type="radio"/>	<input type="radio"/>
30.	Do you use controlled-release and/or slow-release fertilizers?	<input type="radio"/>	<input type="radio"/>
31.	Do you maintain records on the implementation of the Indian River Citrus BMPs as identified on the Notice of Intent submitted for this operation?	<input type="radio"/>	<input type="radio"/>
32.	Do you have a copy of the Indian River Citrus BMP manual?	<input type="radio"/>	<input type="radio"/>
33.	Did you find the manual helpful to you in implementing the BMPs?	<input type="radio"/>	<input type="radio"/>

**IMPORTANT - Please complete and return by December 30, 2007.**



# INDIAN RIVER AREA CITRUS GROVES BMP IMPLEMENTATION SURVEY

In what format would you most like to receive additional information or training regarding Best Management Practices?

Low preference			
Medium preference			
High preference			
Please indicate your preference for each of the methods below.	H	M	L
Audio (CD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Video (DVD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print Brochures / Fact sheets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer CD ROM/DVD ROM	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On-line Courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet Web Site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field day on IFAS research facility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field day on a working farm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technical assistance by personal visit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technical assistance by telephone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trade show	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Workshop by FDACS Staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Workshop by industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other form or method of instruction (please write in space below)			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What specific topics of interest would you like to see covered? (please specify below)			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**IMPORTANT - Please complete and return by December 30, 2007.**



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## APPENDIX 6

### INDIAN RIVER CITRUS BMPs AND RELATED MANAGEMENT ACTION QUESTIONS

BMP #	BMP NAME/DESCRIPTION	RELATED QUESTIONS
A1.	<b>Water Table Management</b> (ditch/canals, control structures, active monitoring)	1
A2.	<b>Scheduling Irrigation and Drainage</b> (maintain water table that optimizes production)	2
A3.	<b>Moderate Discharge Rate</b> (limit off-site discharge to rate of lateral drainage)	3
A4.	<b>Water Furrow Maintenance</b> (to achieve uniform drainage)	4
A5.	<b>Monitor Soil Moisture</b> (to manage irrigation and drainage)	5
A6.	<b>Drainage Management Plan</b> (written drainage management plan)	6, 7
A7.	<b>Drainage Rate and Volume</b> (to minimize off-site impacts)	8
A8.	<b>Discharge Structures</b> (safe, effective, easy to adjust to meet target levels)	9
A9.	<b>Detention</b> (sufficient onsite capacity)	10
D1.	<b>Education</b> (proper training of field operators)	11, 12
D2.	<b>Nutrient Management</b> (written plan based on sample analyses and expected yields)	13
D3.	<b>Employ Tissue and Soil Analyses</b> (to avoid over-fertilization)	14
D4.	<b>Use Appropriate Application Equipment</b> (for precise, consistent applications)	15
D5.	<b>Equipment Calibration and Maintenance</b> (to avoid misapplication of nutrients)	16
D6.	<b>Apply Materials to Target Sites</b> (within root zone area or drip-line of trees)	17
D7.	<b>Avoid High Risk Applications</b> (when runoff or leaching is possible)	18
D8.	<b>Fertilizer Storage</b> (proper precautions taken if fertilizer is stored onsite)	19
D9.	<b>Spilled Fertilizers</b> (immediately removed from ground surface)	20
D10.	<b>Use Caution When Loading Near Ditches, Canals, and Wells</b> (fertilizer loading)	21
D11.	<b>Alternate Loading Operation Sites</b> (to prevent concentration of nutrients)	22
D12.	<b>Use Backflow Prevention Devices</b> (on irrigation and spray tank filling systems)	23, 24
D13.	<b>Split Applications Throughout Season</b> (multiple applications during year)	25
D14.	<b>Erosion Control</b> (minimize soil and nutrient losses due to runoff)	26
D15.	<b>Irrigation Management</b> (proper scheduling and uniform water distribution)	27
D16.	<b>Incorporate Organic Materials</b> (as a means of soil amendment)	28
D17.	<b>Well Protection</b> (properly decommission inactive wells)	29
D18.	<b>Use Appropriate Sources and Formulations</b> (fertilizer sources and formulations)	30

## APPENDIX 7. Indian River Citrus BMP Implementation Survey Data

RESPONSES TO IMPLEMENTATION CATEGORIES												OVERALL BMP IMPLEMENTATION RATE				
BMPs ON SURVEY	RESPONSE RATE*	FULLY IMPLEMENTED		PARTIALLY IMPLEMENTED		TECHNICALLY NOT FEASIBLE		ECONOMICALLY NOT FEASIBLE		NOT APPLICABLE		RESPONSE RATE	YES		NO	
		#	%	#	%	#	%	#	%	#	%		#	%	#	%
A1	42	31	73.81	10	23.81	0	0	0	0	1	2.38	42	42	100	0	0
A2	42	34	80.95	8	19.05	0	0	0	0	0	0	42	42	100	0	0
A3	42	29	69.05	11	26.19	0	0	0	0	2	4.76	40	34	85	6	15
A4	42	33	78.57	6	14.29	0	0	1	2.38	2	4.76	42	38	90.48	4	9.52
A5	42	28	66.67	8	19.05	2	4.76	1	2.38	3	7.14	42	32	76.19	10	23.8
A6	42	22	52.38	9	21.43	3	7.14	0	0	3	7.14	42	38	90.48	4	9.52
A7	42	30	71.43	6	14.29	3	7.14	0	0	3	7.14	41	40	97.56	1	2.44
A8	42	30	71.43	7	16.67	1	2.38	1	2.38	3	7.14	41	38	92.68	3	7.32
A9	42	22	52.38	8	19.05	4	9.52	1	2.38	7	16.7	42	33	78.57	9	21.4
D1	42	35	83.33	6	14.29	0	0	0	0	1	2.38	42	42	100	0	0
D2	42	30	71.43	8	19.05	2	4.76	1	2.38	1	2.38	42	35	83.33	7	16.7
D3	42	33	78.57	6	14.29	0	0	1	2.38	2	4.76	42	35	83.33	7	16.7
D4	42	37	88.1	5	11.9	0	0	0	0	0	0	42	41	97.62	1	2.38
D5	42	38	90.48	3	7.143	0	0	0	0	1	2.38	42	42	100	0	0
D6	42	39	92.86	2	4.762	0	0	0	0	1	2.38	42	41	97.62	1	2.38
D7	42	40	95.24	2	4.762	0	0	0	0	0	0	42	42	100	0	0
D8	42	31	73.81	1	2.381	0	0	0	0	10	23.8	41	41	100	0	0
D9	42	38	90.48	3	7.143	0	0	0	0	1	2.38	42	33	78.57	9	21.4
D10	42	39	92.86	2	4.762	0	0	0	0	1	2.38	42	42	100	0	0
D11	42	36	85.71	2	4.762	1	2.38	0	0	3	7.14	42	41	97.62	1	2.38
D12	42	31	73.81	6	14.29	1	2.38	1	2.38	3	7.14	41	40	97.56	1	2.44
D13	42	36	85.71	5	11.9	0	0	0	0	1	2.38	42	40	95.24	2	4.76
D14	42	36	85.71	4	9.524	0	0	0	0	2	4.76	42	41	97.62	1	2.38
D15	42	36	85.71	5	11.9	0	0	0	0	1	2.38	42	42	100	0	0
D16	42	19	45.24	8	19.05	2	4.76	5	11.9	8	19	42	23	54.76	19	45.2
D17	42	29	69.05	5	11.9	0	0	1	2.38	7	16.7	42	37	88.1	5	11.9
D18	42	40	95.24	2	4.762	0	0	0	0	0	0	41	34	82.93	7	17.1
ALL			78.12		13.11		1.68		1.15		5.93			91.31		8.69

\* There were 47 responses to the survey; however, four responders indicated they were no longer in production and one did not complete the survey.

## APPENDIX 8

### CALCULATION OF OVERALL BMP IMPLEMENTATION RATES BY PROGRAM

#### **Suwannee River Basin**

In 2007 in the Suwannee River Basin, inspections were conducted on 129 of 163 participating poultry farms and 30 of 47 participating dairy operations. Some operations were visited more than once. Ratings of *Satisfactory*, *Conditional Satisfactory*, and *Unsatisfactory* are given in multiple categories. For this basin, staff averaged the percentage *Satisfactory* ratings in each inspection category.

For poultry operations, *Satisfactory* ratings were 100% for litter management, 98% for mortality management, and 56% for litter records. Averaging these three percentages gives an overall program implementation rate of 85%.

For dairy operations, *Satisfactory* ratings were 78% for dairy collection and transport, 85% for manure storage, 85% for manure utilization, and 40% for record keeping. Averaging these four percentages gives an overall implementation rate of 72%.

#### **Lake Okeechobee Watershed**

Out of 57 operations inspected, 38 received an overall *Satisfactory* rating. A simple calculation (dividing number of ratings by number of operations) gives an overall implementation rate of 67%. The rest of the operations inspected (33%) received a rating of *Needs Improvement*.

#### **Ridge Citrus**

The Ridge Citrus BMP is a single nutrient application practice that sets varying fertilization rates based on tree age groups and seasonal factors. Adherence to the BMP by survey responders breaks down as follows:

- 1-3 year old tree blocks:
  - ✓ 24/25 producers adhering to BMP for individual application rates
  - ✓ 24/25 producers adhering to BMP for annual application rates
- 4-6 year old tree blocks:
  - ✓ 28/28 producers adhering to average annual application rates
  - ✓ 27/27 producers adhering to dry season application rates
  - ✓ 26/27 producers adhering to wet season application rates
- Mature tree blocks (7+ years):
  - ✓ 115/123 producers adhering to average annual application rates
  - ✓ 120/123 producers adhering to dry season application rates
  - ✓ 106/123 producers adhering to wet season application rates

This is a total of 470/501 total responses indicating adherence to the applicable aspects of the BMP, which calculates to an overall implementation rate of 94%.

## Indian River Citrus

The overall program BMP implementation rate was calculated using a conservative approach, taking the lower of the two implementation values for each practice on the survey (the fully/ partially implemented rate – *the first row of numbers in Figure 9 in the body of the report*, or the management actions rate – *the second row of numbers in Figure 9*). The sum of the lower rates for all practices was divided by the total number of practices surveyed, which gives an overall implementation rate of 88%.

The following table summarizes the results of the calculations described above.

OVERALL BMP IMPLEMENTATION RATES BY PROGRAM*			
SUWANNEE RIVER	LAKE OKEECHOBEE	RIDGE CITRUS	INDIAN RIVER CITRUS
Dairy: 72%	67%	94%	88%
Poultry: 85%			

*\*These figures must be considered in the context of the detailed results and discussion presented in this report.*