



Strategic Management Plan for Prioritizing Florida's BMP Research Initiatives

June 2016



Purpose

This plan will be updated each year, as applicable, and will provide the guiding principles to Office of Agricultural Water Policy (OAWP) staff pursuant to what research should be considered for funding each fiscal year in support of Florida's agricultural Best Management Practices program. It includes the formation and use of a committee, solicitation and prioritization of needed research, good contracting practices, and dissemination of research project information on an annual basis.

Role of Research Coordinating Committee

A Research Coordinating Committee (RCC) will be used and will consist of representatives from the agricultural industry, water management districts, UF-IFAS, NRCS, FAMU, FDEP, FDACS, and others as deemed appropriate. The charge of this standing committee will be information gathering, identification of gaps, prioritizing research needs on a five-year basis, and providing direction to OAWP staff regarding new BMP ideas that lack the requisite research to support their widespread use. The RCC may, at its discretion, create subcommittees to assist the OAWP with research project proposal ranking and decision-making.

It is anticipated that the RCC will meet at least twice a year to conduct routine business. Ideally, the first meeting should be held well in advance of the upcoming fiscal year to help OAWP set and/or align research priorities; with the second meeting held to rank or vote on proposals submitted for funding consideration. OAWP staff will facilitate, or can co-chair the committee, if members decide on such an organizational structure. Minutes will be drafted by OAWP, approved by the committee, and distributed to members and interested parties following each meeting.

Process for Setting Research Priorities

OAWP has instituted a procedure to review and update BMP manuals every five years. Aside from mandatory, statutorily-driven research mandates discussed below, the RCC can choose to “mirror” the OAWP manual update schedule so that priority research projects neatly track manual development schedules; or, may choose to establish their own process. Whatever process is used, the RCC should memorialize it and publish the prioritization results in future updates to this plan in **Appendix A**.

Statutory Priorities

Existing BMP research authorities are found in Section 403.067, F.S. These generally deal with the OAWP’s obligation to demonstrate the effectiveness of BMPs on water quality through a variety of measures: best professional judgment; use of literature values in scientific publications; and/or successful water quality BMP studies conducted at representative sites.

Effective July 1, 2016, new research priorities have emerged per the requirements pursuant to Section 373.813, F.S. These deal primarily with devising new strategies to protect springs and springs recharge areas, focusing on the use of controlled-release fertilizers and other nutrient management tools, although this is not all-inclusive list of research topics. The RCC can choose to expand this research arena for agriculture.

Types of Candidate BMP Research Projects

For purposes of this plan, OAWP will entertain research proposal funding consideration, as long as they meet the following criteria.

- **BMP Effectiveness Projects** – These projects will contain the proper experimental design to demonstrate the effectiveness of irrigation and nutrient BMPs. The focus will be on existing BMPs that have significant gaps in effectiveness data. Consideration will be given to two-stage projects where the first stage is a gap analysis that shapes the second stage.
- **Technology Based Projects** – These projects will contain the proper experimental design to demonstrate the effectiveness of new and emerging BMP technologies. These will help set the stage for the next generation of BMPs.
- **Water Quality Improvement Projects** – These projects will concentrate on water quality improvements using edge-of-farm, regional, or target waterbody strategies.
- **On-Farm Demonstration Projects** – These projects have passed a proof-of-concept and/or farm-scale research and have valid data to support BMP implementation. They are conducted on private lands to help with the transfer of technology to area growers.

Announcement of Research Priorities by Fiscal Year

Once the RCC ratifies the annual research priority list, OAWP will work to advertise the committee's action, so that submitted research proposals are in line with the priorities. Developing press releases sent to universities, advertising in the Florida Administrative Weekly and engineering trade journals, etc., are some ways to announce this to qualified interested parties.

Contracting Procedures

Negotiating with contractors/principal investigators must begin by requiring them to develop a comprehensive draft scope of work using standardized formats pursuant to the guidance that exists in: <http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/BMP-Research>. Proposals must include adequate replication,

good experimental design, water quality sampling, and a minimum dataset that meets the criteria in **Appendix B**. However, proof-of-concept and on-farm demonstration studies do not have to meet the Appendix B dataset requirements. Further, it is important for proposals that evaluate new or emerging BMP technologies to have a cost effectiveness component built in to the scope of work.

Once the scope of work, budget, and associated costs analysis have been approved by OAWP management, staff responsible for research can proceed with contract development in accordance with state law and FDACS administrative policies and procedures.

Schedule for Solicitation, Receipt, and Review

In general, OAWP will announce an annual solicitation for research project proposals in early spring, and will establish a reasonable time period or deadline to receive them. Proposals will be deemed complete only after they comport with the standardized formats mentioned above. All proposals deemed complete will be date stamped and forwarded to the OAWP review team. The schedule will allow for some flexibility for proposals that are of high interest to the RCC.

Dissemination of Research Project Results

Deliverable-based progress and final reports must be requested as PDFs, and saved under the deliverable tab in the OAWP Contract Management System. This will ensure proper records retention and easy retrieval for sharing the results with outside parties.

New projects and existing projects that are being funded over multiple years should be listed and/or updated on OAWP's BMP Research webpage at the beginning of each fiscal year. A short synopsis of the research project objective will suffice for this level of information.

Annual Research Conference

For multi-year research projects, it is important for principal investigators (PI) to share their results to date with the RCC. The RCC may choose to host an annual research conference so that PIs can present and elaborate on key elements of their projects. This can lead to ideas for project improvement, and may justify the need to formally amend certain projects.

Documentation of Completed Studies and Effectiveness Data

As stated above, it is not atypical for research projects to span over a time frame of two to three years. Once the project is completed and the results published in a peer-reviewed scientific journal, it is important for OAWP to obtain the publications and “index” them using the Excel research publication spreadsheet, or a similar management tool.

There is heightened interest in demonstrating the long-term effectiveness of BMPs on improving water quality. Ultimately, this requires a comprehensive approach that includes good experimental design, nitrogen and phosphorus water quality sampling, quality assurance/quality control, a minimum dataset and statistical analyses. OAWP staff responsible for research should consider using a meta-analysis to be performed every three to five years, unless a superior method is discovered. Meta-analysis is useful in determining an overall effect size from BMP study results, so long as they contain a measure of central tendency and variance for a treatment of interest. This, coupled with a response ratio procedure, will enable comparison of data with different units, and is likely superior to the standardized mean difference, which requires the same unit type for comparisons to be made.

APPENDIX A

- Controlled release fertilizer literature review and preparation of Florida specific guidebook (statutory requirement)
- Identification of critical sources and flow paths, including the methods of addressing them
- Use of multiple cropping systems, cover crops, or alternative crops to reduce N leaching in high-recharge and excessively drained springs recharge areas
- New or enhanced BMPs, including nitrification inhibitors
- Tailwater recovery treatment for bacterial contaminants. There are ongoing concerns about using tailwater or reclaimed water on vegetables, partly because of the food safety modernization act but also because of vendor requirements for testing
- Biosolids used on ranches and concerns about offsite P movement or leaching
- Water treatment technologies and practices for on-farm or edge-of-farm application; regional water treatment technologies to be considered for research in coordination with FDEP and the WMDs
- ET-based and pulsed-based overhead irrigation for container nurseries
- Development of crop coefficients (if needed) for irrigated crops in springs recharge areas

APPENDIX B

Minimum Dataset Elements – usually expressed as “control” and “treatment” with adequate size (plot acreage) and a minimum of 3 replicates to provide statistical rigor. Data provided to FDACS must include a control mean, control standard deviation, control number of observations (replicates), as well as treatment mean, treatment standard deviation, treatment number of observations (replicates), and other statistically valid endpoints so that post-project BMP effectiveness analyses can be performed.

Data Deliverables- The principle investigator for each study shall populate the following table for each individual experiment conducted during the study (see example below).

Example	Control mean	Control St. Dev.	Control Sample Size	Treatment mean	Treatment St. Dev.	Response variable and units	Treatment Sample Size
Vegetables (tomato) Study: Random Block Control-Impact BMP: Tested difference between timed irrigation/moderate fertilization (control) with sub-surface drip irrigation/moderate fertilizer regime (treatment). Replication: Groundwater under plots measured for 3 years. Data presented as yearly average for each treatment. Calculation: Three years were averaged for mean and standard deviation.	20.80	15.24	3	3.77	1.37	Nitrate load (kg/ha)	3