FPPC

Farm Pilot Project Coordination, Inc.
"Technologies for Nutrient Management"

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September ~~April~~ - ~~30th~~ ~~12th~~, 2005

To: Mr. William Boyd - Leader, Animal Waste Utilization Team
East National Technical Support Center - NRCS

From: Bob Monley, General Manager, FPPC Inc.

Copy: Carolyn Adams, NRCS – Director ENTSC
Bruce Newton, NRCS - Director WNTSC
Ron Williams, NRCS – Director CNTSC
Richard Salem, Executive Director & Board Chairman, FPPC Inc.
Robert Zaytoun, FPPC Board Director
Dr. Robert Carnahan. FPPC Board Director
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Sara Royer, FPPC Treasurer
Peter Hubbell, Principal - Water Resource Associates
Barry Kintzer, NRCS - HDQ/DC
Frank Bordeaux, Executive Director – N.C. Agricultural Finance Authority
Frank Lancaster, N.C. Agricultural Finance Authority
Dudley Voorhees, FPPC Field Coordinator
Susan Mcloud, NRCS – AWUT, ENTSC

Re: Quarterly Update for period from July 1st thru September 30th, 2005

This quarterly report is intended to update the NRCS and the FPPC Inc. Board of Directors on the status of the innovative technology pilot projects.

Executive Summary

FPPC was an invited exhibitor and participant in the White House Conference on Cooperative Conservation held recently in St. Louis. On October 5th, a paper describing the role of FPPC will be presented at the Animal Waste Management Symposium in Raleigh, NC. The paper will be subsequently posted and available on the webpage.

At the last meeting, the Board approved funding on two (2) pending projects and took action on panel recommendations for five (5) proposed projects. Funding was reserved on two (2) more projects subject to additional due diligence and subsequent Board review. The net effect of these actions was to commit most of the 04 monies.

Seven (7) pilot projects are now complete. Of these, six (6) have final reports available while the seventh is in draft form. FPPC remains confident of the progress demonstrated to date on all but two pilot projects.

OPERATIONS Report ----------

1. The outcome of the July 19th FPPC Board meeting provided funding for approved projects. All who submitted proposals have been notified of their funding status. Five (5) proposals, listed below, were approved for partial funding subject to final agreement. The status of current negotiations is further described later in this report.

Approved (Total Amount Not to Exceed):	
WorldWideBioEnergy	…….. $ 500,000.00
Super Soil Systems	……...$ 550,000.00
Royal Consulting	……..$ 400.000.00
DOACS at M&B Dairy	……...$ 165,000.00
QED Occtech	……$ 250,000.00

Pending added due diligence and feedback to the Board, tentative funding was reserved for a gasification project proposed by Coaltec in Erath County, Texas and a biological treatment system utilizing soldier fly larvae at a farm site in Tifton, Georgia

Proposal Request	
Coaltec	……..$ 412,000.00
Univ of Ga	…….. $ 445,622.00

The above proposals are discussed in more detail later in this report.

2. A busy congressional agenda (i.e. hurricane relief) has delayed the congressional briefing on the Farm Pilot Program until March - 2006.

3. The opportunity for more exposure in the recent White House Conference on Cooperative Conservation prompted the need for more Farm Pilot exhibit materials. Building on the experience from the past Technology Summit, additional brochures were prepared and a professional grade exhibit with travel case was purchased for that purpose. Presentations from a myriad of national policy decision makers confirmed the need for greater cooperation among governmental agencies and integration of local, public and private environmental concerns. Follow up FPPC actions include awarding the advertised complimentary weekend in St. Petersburg and adding the attendee list to our mailing list and advising them of our upcoming Summit in May 2006.

4. Tim Robinson resigned the Field Coordinator position to take an opportunity at another company. Replacing him is Dudley Voorhees, who brings a formal education as an agricultural engineer that complements his years of business experience and sales background. Dudley is initially focused on the restart of the Watson Dairy project but will be systematically visiting each of the other current sites. In October, Lauren Siegel, a recent USF graduate in environmental science, will assume responsibility for administrative support and research analysis.

5. In multiple meetings with John Folks, from the State of Florida, Department of Agriculture and Consumer Services, the benefits of working cooperatively on Florida farm sites has

become apparent. At the moment, DOACS and FPPC are pursuing an appropriate agreement that will leverage funding and advance mutual interest.

6. An ongoing dialogue with FPPC continues with new related interests. Notably, Mr. Herb Teague and Mr. Rick Diedrich from ILS have been very active in promoting a fully integrated gasification system primarily in the San Joaquin Valley and the Chino Valley of California. Ms. Beverly Saunders, from the Poultry Partners of Oklahoma continues to explore potential funding for a pilot design and demonstration of a mobile bailer that could collect, wrap and isolate poultry litter. Mr. Ryan West, Director of Legislative Affairs and Policy Analysis for the State of Indiana, has scheduled an introductory meeting with FPPC to discuss mutual opportunities in Indiana at the recently announced "Bio Town" demonstration in Reynolds, IN. Also, Mr. Martin Borner from Plocher Energy Systems, who visited FPPC in 2004, continues to make inquiries about possible grant opportunities available from FPPC. All parties have been sent letters welcoming their interest in nutrient reduction, farm pilot demonstrations and encouraging their participation in the RFP process.

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Progress at existing pilot demonstration sites is summarized below:

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RMG Strategies, Ltd and Microganics ----------

Process:

- The use of "Bio-Regen Animal" product contains "Carboxx" and Bacillus microbes, a natural, supersaturated, highly soluble, high reactivity humic acid (HRHA)
- The ultra-pure formula provides an unprecedented capacity to capture and absorb a wide array of impurities found in soil or wastewater
- This process will provide a 75% nutrient reduction in the waste water column, concentrating nutrients in the sludge layer while decreasing odor
- Poultry and swine lagoon application

Jacobs Ranch site #1 ----------
Layer hen facility in Carmine, Texas

Problems Encountered:

In July, during the facility management's yearly practice of lowering lagoon levels to allow for rain events, a pipe was discovered that connected the treated lagoon to the control. This pipe was not shown on any diagram that the owner, Environmental Engineer, or permitting office retained. A visual inspection of the pipe confirmed that water was passing through from one lagoon to the other, invalidating any project data that had been collected to date. Subsequently, the pipe was cemented in and the two lagoons were effectively separated.

In August, one of the Blue Frogs recirculating pumps was hit by lightning and rendered inoperable. A new motor was ordered, however, because of the isolated facility location and type of work, it took several weeks to schedule an electrician for installation.

Once the motor was replaced, the unit still wasn't functioning properly and the electrician was re-scheduled for the end of the month. The manufacturer will advise the electrician on repairs.

Project Status:

The change to treatment with Bio-Regen Municipal has shown favorable results. The DO levels in the treated lagoon have increased significantly, indicating a change to aerobic conditions. Odors emanating from the treated lagoon have been further reduced and surface solids remain much less dense than the untreated lagoon, however laboratory results continue to be inconclusive for nutrient reductions in the water column.

Since the control lagoon is almost twice the size of the treated, dosing and treatment were inadequate to address loads 3 times those expected to achieve significant nutrient reductions. In an effort to salvage the project and because the control lagoon was no longer a viable comparison, it was decided to continue treatment of P-1 to compare to a baseline of the first data collected after the pipe was closed. Due to excessive laboratory lag times in reporting of data from analysis of samples, it was decided that future samples should be analyzed by Midwest Laboratories in Omaha, NE.

A decision was also made to install additional innovative technologies for intensive and concentrated treatment. In August, EchoBoom material (floating curtain) was installed to channel influent from barns in a U shape through the lagoon and Blue Frog mixing/aeration areas to provide increased retention and treatment time. In September, Bio-Bags (waste specific microbial consortium) were strategically placed in the lagoon at the water/sludge interface to enhance Bio-Regen treatment and further accelerate nutrient metabolism and sludge reductions. The first sampling event following installation of both technologies will be in October.

As stated in the original Plan of Work, upon initial treatment, stabilization of the lagoon takes 30-45 days and measurable nutrient reductions are not expected before 3 months of continuous treatment. Due to contamination from the control lagoon, efficient treatment effectively did not begin until July 13, when the pipe was closed off. In addition, one aerator has been inoperable for a period of time. Therefore, it is not probable to expect the nutrient reduction goal of 75% will be realized by November, 2005 the original cutoff milestone.

Alternate Swine Facility – North Carolina ----------

On July 7, Lisa DeHaas, Microganics Project Manager, and Frank Bordeaux, on behalf of FPPC, accompanied Sam Ennis, Smithfield/Murphy Brown, on a tour of potential project locations. The sites were evaluated based on criteria established to comply with study requirements. A site was selected near Fayetteville, NC, to use as the treated facility. Following the visit, Sam was informed of criteria for a control site and information needed on both facilities for completion of the Plan of Work.

A portion of the requested information was received; however the originally identified control site did not fit the required criteria. Smithfield has verbally indicated their willingness to participate but a formal commitment and the remainder of the requested information is expected within the next week.

AJT/Agrimond ----------
Watson Dairy in Trenton, FL
"Florida Dairy Nutrient Management Demonstration Pilot Project for Watson Dairy"

Process:
- Sand/grit removal.
- Solids separation.
- Primary anaerobic treatment and secondary aerobic treatment with enhanced aeration.
- Suspended solids precipitation using polymers.
- Anoxic treatment for denitrification prior to land application.

Project Status:

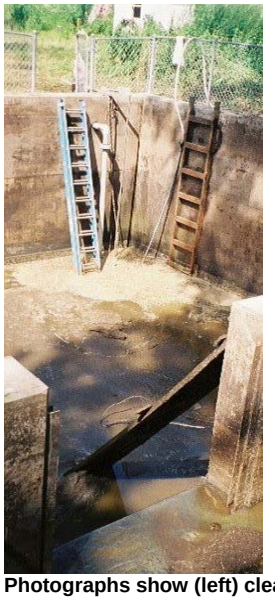
The initial cleanout of the primary basin and systems check has been completed by AJT-Agrimond. The interconnecting pipe between the primary basin and the failed basin as well as the concrete spillway has been permanently blocked.

Continued reoccurrence of carryover from the sand trap downstream to the lift station has prompted a concern about daily maintenance and the effective capacity of the sand trap. A focused effort to observe daily and tighten controls on the front end of the system is being emphasized. A self cleaning screen was designed and installed by Agrimond to prevent foreign material (ie tags, wire, rope, leaves, grass etc) from entering the lift station. Also, a self cleaning screen at the egress of the sand trap is being pursued. To this end, Dudley Voorhees has been on site daily as needed to assist and coordinate.

TriCounty Irrigation has delivered all pumps and checked the electrical integrity of the system. Lewis and Dudley have been on site working together to assist in the cleanout of the connecting pipe to the screen and removal of excess material at the bottom of the lift station. Last efforts on September 30th during the lift station cleanout, resulted in a lift pump failure of one phase of the motor. A replacement and/or motor repair is being pursued on an expedited basis..

While progress continues to be made, the project is at a critical phase requiring frequent communication, objective feedback and cooperation between the technology provider and the farm owner. Jesse Wilson has been invited to observe the sand trap carryover on site and to make any helpful suggestions.


Photographs above depict (left) primary basin clean out operation prior to the restart and (right) in operation.




Photographs show (left) cleaning lift station and (right) newly installed self-cleaning screen.

Applied Chemical Magnesias Corp. (ACM) ----------
Bella Holstein Inc. - Dairy in Platteville, Colorado

Process:

- Easily-assembled recovery system that utilizes the reaction capabilities of inexpensive, milled brucitic marble to extract between 75% - 90% of most nutrients
- Uses magnesium source to react with Nitrogen & Phosphorous to form a crystal precipitate.
- Uses mechanical cellulose separator, a series of reaction tanks (sized for the anticipated flow) with simple mechanical (paddle) agitation, and a hydro-cyclone separator and drying screen for the recovery of the precipitate.
- Precipitated crystals and liquid are sent to the drying screen; crystals are separated from the liquid then stored for various farmers to use as a slow release fertilizer. The remaining liquid flows to a lagoon for solids settling.

Problems Encountered:

~~1)~~Mac McCreless, from ACM, has explained that the pH levels are too high for the brucitic marble to efficiently accumulate phosphorous from the effluent within the reaction tanks. Coupled with the high flow rate of the effluent from the barn and milking parlor, the process appears incapable of achieving a 75% removal of phosphorous from the waste stream before it is emptied into the lagoon basin.

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To better consider the available alternatives, a joint meeting between Dr. Jessica Davis from Colorado State University, ACM, WRA and FPPC has been set for the first week of November. The plan forward should also determine why the waste stream pH level is unexpectedly high. No additional progress payments have been or will be made to ACM until a satisfactory recovery plan is generated.

Chemical Lime ----------
Aprile Dairy in Riverview, FL
"Nutrient Removal from Dairy Farm Wastewater Using Lime"

Process:
- Use of chemical lime to reduce nitrogen and phosphorous loading in dairy wastewater.
- Screening and sand removal.
- Dewatered effluent treated with lime to precipitate P and N.
- Ammonia captured as ammonium nitrate.
- Treated water recycled as flush water.

Problems Encountered and Project Status:

While a leased portable screen from Vincent Inc. in Tampa has been found to be a cost efficient substitute for the T-Rex dewatering unit, a new recent site assessment together with continued deterioration of equipment readiness, on-site support and the apparent winding down of the dairy operation has prompted reevaluation and consideration of a different course of action.

First, it is increasingly apparent that the large tracts of residential development are rapidly changing the property values near Aprile Dairy - Riverview site since the project was undertaken. In contacting the farm owner about the status of the rezoning issue and his potential sale of the property, he continues to downplay any interest in the current FPPC project. Indeed the declining herd size and the lack of a permanent replacement of the milking parlor structure, damaged by last year's hurricane, seems to confirm the fate of the farm property.

In the meantime, Chemical Lime has sent a written request asking FPPC in light of the situation to consider a move to another site. Therefore, FPPC has asked for budgetary estimates, process input from Pete Hubbell, WRA, and has scheduled a September 30th meeting at the Riverview site with Neil Beckingham, QED Principal, Roger Nordstedt, PI from University of Florida, and Dudley Voorhees, FPPC Coordinator. Together, they will assess the feasibility of salvaging equipment, transportation and incorporating process

elements of the Chemical Lime project into the QED proposed project. Cost implications, findings and recommendations will be reviewed before a final decision is reached.

Renewable Oil Inc., Alabama Operations ----------
Mills Poultry Farm in Russellville, AL
"Demonstrating Bio-oil Technology for Poultry Litter Nutrient Management"

Process:
- Mobile processing plant to burn poultry litter.
- Poultry litter would be removed from houses and burned.
- **Pyrolisis** process produces nutrient rich ash and vapor that is converted to bio-oil.
- Bio-oil and ash would both be available as marketable products.
- Bio-oil produced is a low-grade fuel for heaters to warm poultry houses.

Problems encountered and project status:

The intended sale of the Daniel Mills farm in Alabama has not occurred to date. The project however is still fully supported by the existing farm owner who will encourage continuation of the pilot demonstration should the farm ownership be transferred.

ROI had requested additional funding for modifications to the condenser system, after an independent review indicated what system modifications were most appropriate. The Board approved $ 12,500.00 of additional funding with an equal amount of cost sharing provided by the vendor. The revised work scope has been submitted and project completion for the remaining scope is expected within 6 months.

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New projects subject to final agreement:

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Global Resource Recovery Organization (GRRO) ----------
Swine Farm, Hardin County, Iowa

Process:
- System will use a highly efficient scraper system, efficient manure transfer and capitalizes on new construction techniques, low water consumption, minimum odor
- Pre-Separation Cyclone (liquid removal)
- Modular designed cyclonic drying system (Tempest dryer).
- Development of value added/commercial grade product - slow release fertilizer.

Project Status:

This project is intended to demonstrate the next generation of lower cost mobile tempest dryers applied in an optimum way to minimizing water and odor. A grant amount not to exceed $500,000 (vs. the $784,000 original funding request) was approved by FPPC Board action. A new budget reflecting the FPPC commitment has been prepared and submitted. Negotiation is currently in progress and final agreement is expected to be competed in October.

Utah State University ----------
Center for Profitable Uses of Agricultural Byproducts
Blaine Wade Dairy in Ogden, Utah

Process:

- This system utilizes an existing induced blanket reactor (IBR) type of anaerobic digester converting organic carbon in the manure to methane and carbon dioxide. Biogas is currently being produced from this system on a 24X7 basis and electrical power being produced is being continuously fed into the grid.
- The (IBR) will be supplemented by a new electro-coagulation unit to concentrate nutrients from the effluent of the IBR.
- Individual contributions of nutrient reduction of the screw press, settling basin and the electro-coagulator units will be determined and quantified.
- The observed treated water exiting from the installed IBR system is nearly odorless.

Project Status:

The funding request for $264,000 to supplement the nutrient reduction capability of the IBR anaerobic digester system was approved by the FPPC Board. Final negotiations were completed in the past month with signed agreements representing the technology provider, farm owner and the plan of work.

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Selected proposals pending final agreement and full project funding:

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WorldWide Bio Energy ----------

This project will combine a continuous thermo-chemical process (TC) developed by the University of Illinois and an electro coagulation (EC) technology to produce bio-oil and treat nutrients from a swine waste stream. A follow up telecon with Dr. Carnahan, Les Christensen, from University of Illinois and the engineers from WorldWide BioEnergy resulted in a favorable assessment and a belief that the project plan incorporated a reasonable approach to the larger scale of the planned pilot plant.

During WH Conference in St. Louis, FPPC met the principals of WWBE and discussed the various elements of the Farm Pilot agreement. At that time WWBE expressed their preference for a farm location near Illinois. Otis Jesse, from WWBE, believes there are two significant advantages to the Illinois farm site location – 1) closer proximity to home base would translate to enhanced ability to effectively project manage and provide site support and 2) the previous work on odor controls at the Moorman Illinois farm could be easily incorporated into the proposed project effort. FPPC will conduct a site visit to confirm that the Illinois site is equivalent in the number of swine / waste stream and would be able to source equivalent cost share funding since the projects total cost would be unchanged. A breakdown of proposed local cost sharing is tabulated below:

- $ 225,000. - Illinois Dept of Commerce & Economic Opportunity
- $ 500,000. - Illinois Environmental Protection Agency
- $ 50,000. - Illinois Dept of Agriculture
- $ 225,000. - Private investment with financial partners

The next step is to schedule a trip to Illinois to verify cost share and stakeholders, full project funding and to assess the proposed farm location.

Super Soil Systems ----------

This project seeks to demonstrate the Super Soil System's next generation of nutrient management systems by deploying a mobile unit at multiple farm locations to be moved to multiple farm locations. The project takes aim at lowering the cost of treatment using the new mobile technology. The Board did approve $550,000.00 for the mobile unit and testing/monitoring.

Recently, it was learned that significant funding and cost sharing from NC would be available to enhance the proposed mobile project demonstration by enabling testing on a small, medium and larger scale operation.

The next step is to finalize an FPPC agreement with Super Soil Systems.

Royal Consulting at Butler Farms ----------

This project is now fully funded with a commitment from DOACS, who has indicated they will support funding shortfall. DOACS required additional assurance that the phosphorus budget in the South Dade region will not be exceeded by this project or by introducing composting products into the market place. A grantee conference was conducted in Tampa to align sponsors, resolve issues and to plan the next steps. A commitment letter describing the fate of nutrients has been generated by the composting supplier and has been provided to DOACS for review.

DOACS at M&B Dairy ----------

This project was fully funded at the outset, but subsequent meeting with all parties has revealed that the farm owner was concerned about achieving economic benefits for his investment and FPPC is concerned about economically achieving the targeted phosphorus reduction. To clearly focus the project activity with a project manager, consulting engineer, Michael Hollaway will assume responsibility for reformulating the proposed project design elements and budget for purposes of optimizing economics and outcome.

QED Occtech at Branford Dairy ----------

The Board approved funding this project but the total project budget was left with a shortfall of $245K. Subsequently, the funding gap has been partially closed with a $100K commitment from DOACS and an additional $ 50K from the owner.

Efforts to seek added cost sharing via EQUIP at NRCS did not result in additional project funds. Presently, QED is re-examining the project budget, and sharpening their analysis of cost sharing as well as investigating an opportunity to combine demonstration efforts at Branford Dairy with the remaining scope of the Chemical Lime project now underway.

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Proposals requiring more due diligence & subsequent review:

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Coaltec Inc. at JamDot Dairy ----------

The principals of Coaltec and the Traweek family, owners of the dairy in Erath County Texas, were advised of FPPC's continuing interest in gasification, however increased confidence in the proposed projects was a prerequisite before the Board

was willing to make a funding commitment. FPPC determined that proposed funding needed to reflect more cost sharing, and a closer look at the technical feasibility of the project would be required. In addition, the Board requested assurance that the community and environmental climate was supportive of a pilot demonstration.

To assess the technical complexibility, Pete Hubbell recently witnessed a test burn in Cartersville, Indiana and discussed issues with the principal of Coaltec. Mr. Hubbell indicates that the gasification system is relatively simple – but more work is needed to define how benefits will be derived. It was apparent during the field visit that the farm owner/family was firmly committed to the project. Regarding the funding and cost share, Congressman Carter, who represents Erath County, has offered his support in helping get the project fully funded.

The next step is to assess the political will of the community to determine if there is clear alignment and support to conduct a successful project demonstration.

UGa and use of Black Soldier Fly Larvae ---------- Tifton, Ga

This project seeks to demonstrate an expanded a biological approach to swine waste treatment on a 1000 sow farm. The proposal investigators have been advised of FPPC continuing interest in the technology but the Board needed to gain higher confidence before making a funding commitment. The next step is to schedule a site visit to better understand the details of the proposed project and to explore options to optimize project funding request.

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Completed pilot demonstration projects are listed below:

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Super Soil Systems, USA ----------
Goshen Ridge Farms, LLC
Swine farm in Clinton, NC
"Solids Removal System to Reduce Environmental Impact of Swine Production"

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Report Status:
Demonstration project completed - final report has been submitted.

Air Diffusion Systems ----------
Cavanaugh Farm No. 1
Swine farm in Wallace, NC
"Advanced Microbial Treatment System (AMTS) at Cavanaugh Farm No. 1"

Report Status:
Demonstration project completed – final report being drafted.

Global Resource Recovery Organization ----------
GRRO
Burt Farm & Livestock Co.
Swine farm in Marshalltown, IA
"Pork Nutrient Management Demonstration"

Report Status:
Demonstration project completed and final report has been received. Unused equipment is being dispositioned for salvage value.

Royal Consulting Services, Inc. ----------
Posey Dairy in Lake Placid, FL
"Florida Dairy Nutrient Management Demonstration"

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Report Status:
The final report has been reviewed, issued and is posted on the FPPC website.

McGill Environmental Systems ----------

Delway, NC (Central Processing Facility) With
Poultry Litter Collected from Farms in Sampson County, NC
"Nutrient Management Technology for Animal Feeding Operations"

Report Status:
The final report has been reviewed, issued and is posted on the FPPC website.

Cape Fear Resource Conservation ----------
Rose Hill, NC - Central Processing Facility
Poultry Litter Collected from Duplin County, NC
"Demonstration Optimum Fertilizer of Ash from the BEST Solution for Swine and Poultry Manure Management"

Report Status:
The final report has been reviewed, issued and posted on the FPPC website.

Mountain Organic Materials (MOM) ----------
Randy Johnson and David Parsons Farms
Wilkesboro, NC
"Demonstration of Poultry Manure and Mortality Forced Aeration Composting Bin Systems"

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Report Status:
The final report has been reviewed, issued and posted on the FPPC website.

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