



FPPC

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

TO: Mr. William Boyd - Leader, Manure Management Team, ENTSC - NRCS

FROM Bob Monley, General Manager, FPPC
Aimee Walker Thomas, FPPC Administrative Program Manager

DATE: August 17, 2011

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RE: 2nd Quarter Report for April 1, 2011 to June 30, 2011

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

Executive Summary

FPPC is moving forward with the next phase of developing a mobile system (a working prototype) to treat effluent and capture solids from liquid dairy waste. It will be deployed at a nearby flush dairy near Brooksville, Florida. If successful this unit could be tested at nutrient hot spots like those in high Phosphorous locations of the Chesapeake Bay watershed.

Planning efforts are in high gear for the next regional Technology Summit targeted for the Midwest in Des Moines, Iowa for mid-summer.

OPERATIONS -----

- 1. Staffing Changes:** Farm Pilot is currently consolidating and relocating its office staff and operations to Tampa, moving out of its current facility in Pinellas County which has an expiring lease. Most equipment is being moved to active farm sites but some limited amount of equipment will be warehoused locally until a more definitive need arises. Smaller lab and testing equipment as well as hand tools are being consolidated and assembled into a storage trailer which will be located at the two primary active demonstration sites.

Staffing reductions were implemented to reflect temporary and field support in the short term. In addition, with anticipation of more field support in the Chesapeake Bay watershed region and to be closer to the South Carolina manure to energy site, Preston Burnette relocated to North Carolina.

Progress at active pilot demonstration sites is summarized below.



Dairy, Florida (#4.12 and project 6.03)-----
AWS, LLC and FPPC
Dual purpose pellets derived from dairy solids

Process description:

- FPPC will work with AWS, LLC to develop a mobile pellet plant leveraging the knowledge gained during the previous belt press demonstrations.
- Dual use pellet is intended to be used as either fuel or fertilizer
- The system will borrow from food waste know how and consist of a belt press, pelletizer and fluidized bed dryer.

Project Status:

This project revealed problems at the second process step - pelletizing. Formation of the pellet shape was difficult to maintain in a repeatable manner because of varying moisture levels presented by the dairy waste stream and an inability to precisely match with a binder. The intended use of polymers was not effective as a binder and could not keep extruded shapes together. Hence the project goal of combining a highly effective single stage solid separation method for high moisture waste with an extruded forming process (pellets) could not be achieved without substantial pre-drying to remove the moisture to relatively lower levels. A final report is being drafted to document the conditions evaluated.

Subsequently, efforts were undertaken to evaluate how to simplify/verify the polymer applications but the variability of dairy waste continued to complicate these efforts.

Swine, North Carolina (#6.4.14) -----
North Carolina A&T
University Farm, Greensboro, North Carolina

Process description:

- Incorporates solid separation, effluent treatment and wetland conservation techniques
- Process is designed for a limited resource farm application.

Project Status:

Dr. G. B. Reddy from North Carolina A&T has submitted his findings and a final report is being reviewed. The initial report looks acceptable.

Poultry, Virginia (#6.4.06)-----
Virginia Polytechnic Institute and State University
Heatwole Poultry Farm

Process Description:

- Pyrolysis conversion of poultry litter to bio-fuel oil and bio-char
- Unit employs a fluidized bed and modern controls for managing the system operation

Project Status:

This project is ending and a final report documenting the lessons learned is required.

Emissions and Nitrogen Capture (#6.08)-----

Project purpose:

The objectives of this project include:

- Identify the benefits of land application of Bio-char and its effect on crops and soil health (carbon sequestration, water retention, etc.);
- The application of Nitrapyrin to help stabilize nitrogen when poultry litter is applied and its ability to slow migration; and
- Subsequently understand how the characterization of ammonia adsorption using Bio-char as an activated or non-activated sorption media and evaluation of its utility in swine and poultry house

Project Status:

FPPC received the first screening test results using various poultry litter char plots for the winter crop harvested in June 2011. Mr. Richard Perritt, Executive Director at NC Farm Center, and Scott Weathington presented a brief overview below. Scott's comments are below.

1. Even though chemical differences were not measured the dark biochar performs better than lighter char.
2. With the existing test plots, Nitrapyrin appeared not to have an impact with conventional fertilizer but did appear to increase yields when used in conjunction with poultry litter. The 2X rate of Nitrapyrin in conjunction with litter appears to increase yields by approximately 25%.
3. Excessive levels of nitrogen in the very high application rates of litter caused some lodging of the wheat but the lodging did not affect yield.
4. Yields increased with application of litter until 10t/ac application rates were exceeded and then yield was impacted negatively with increasing litter.
5. Application of composted swine manure (available from Supersoil) did not appear to affect yield however, it was not compared with combinations of conventional fertilizer or with Nitrapyrin.
6. All plots were treated with up to a total of 120 lb/ac. nitrogen to provide a basis of comparison.

Plans are in place to plant soybeans for the next application of field tests. Scott has also suggested a trial where the use of the Nitrpyrin be expanded in combination with litter and/or biochar.



Lab testing and sorption studies of biochar using a third method of activation, potassium hydroxide are complete and the data appears to show nitrogen adsorption improves using this method of activation. Additional review and data interpretation is being conducted.

Manure to Energy (#6.12) -----
Marc Marsh Farms, South Carolina

Project purpose:

To harness the energy value of poultry litter utilizing gasification and poultry litter as a fuel. Electricity will be produced to offset ventilation/cooling costs for the farm.

Project status:

The electric generating system, manufactured by ElectraTherm, has been delivered to the site in South Carolina. Don Malpass, FPPC's ElectraTherm trained technician, is capable of operating and maintaining the complete system.

The gasification/heat exchanger system continues to operate intermittently because of feeding and auger problems. One issue that is being addressed is the difficulty of controlling proper amounts of oxygen and how the operation of the heat exchanger affects the draft of the gasifier.

A public meeting was announced and conducted this month in Chesterfield County, SC to inform the community about the manure to electricity project at the Marc Marsh farm. This clears the way for local zoning and meet the requirements for grid connections.

Manure to Energy and Ash Byproduct (#6.09) -----
Old Mills Farm, Virginia

Project purpose: Phase I -To derive energy and nutrient benefits by gasifying poultry litter and converting the sterile Phosphorous rich ash into a marketable byproduct that can be utilized as a pathogen free fertilizer for the nearby tomato and vegetable crops. The intent is to reduce the typical poultry litter land application in Delmarva area by converting the gasified phosphorous rich ash to a viable pathogen free fertilizer for the nearby vegetable crop. Phase II – harness the usable energy for on-farm electric generation.

Project status:

This project awaits another funding source to support a full scope project.

Effluent Treatment Methods (#6.07A) -----
Multiple dairy sites, Florida

Project purpose:

Develop a graded approach for treating liquid waste utilizing a cost effective system composed of incremental solid separation steps. Multiple pieces of equipment will be linked and connected into an optimum system and will rely primarily on low cost mechanical solids separation methods. The contribution from each piece of equipment will be determined based on the amount of solids and nutrients removed from the liquid waste stream.

Project Status:

This project is now entering a second phase. The prototype system, a new configuration, is designed and ready to be constructed using many components of the previous system. A fabricator has been selected and the proof of concept system (using available trailers as platforms) will be delivered for disassembling and refurbishing, according to the final configuration.

Construction began in June 2011. with two existing trailers and when pulled side by side and leveled will provide an 18 ft wide by 20 ft work platform. All connecting piping will be connected to allow easy access to the operating equipment. A generator capable of supplying all power needs is mounted on a third utility trailer.

An FPPC chemical separator has been designed and is being fabricated. The chemical separator system will be tested with fresh water and then deployed as part of the entire reconfigured system in August at M&B Dairy. Testing and verification of previous performance is being planned with the improved configuration.

Attachment A

Final report status of thirty-six (36) completed pilot demonstration projects is listed below:

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- A. Swine, North Carolina -----
Super Soil Systems, USA (#3.09)
Goshen Ridge Farms, LLC - in Clinton, NC
“Solids Removal System to Reduce Environmental Impact of Swine Production”
Report Status: The final report has been reviewed, issued and posted on the FPPC website.

- B. Swine, North Carolina -----
Air Diffusion Systems (#3.02)
Cavanaugh Farm No. 1 - swine farm in Wallace, NC
“Advanced Microbial Treatment System (AMTS) at Cavanaugh Farm No. 1”
Report Status: The final report has been reviewed, issued and posted on the FPPC website

- C. Swine, Iowa -----
Global Resource Recovery Organization (GRRO) (#3.05)
Burt Farm & Livestock Co. - swine farm in Marshalltown, IA
“Pork Nutrient Management Demonstration”
Report Status: The final report has been reviewed, issued and is posted on the FPPC website.

- D. Dairy, Florida -----
Royal Consulting Services, Inc. (#3.08)
Posey Dairy in Lake Placid, FL
“Florida Dairy Nutrient Management Demonstration”
Report Status: The final report has been reviewed, issued and is posted on the FPPC website.

- E. Poultry, North Carolina -----
McGill Environmental Systems (#3.06)
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.

- F. Poultry, North Carolina -----
Cape Fear Resource Conservation (#3.03)
Central Processing Facility in Duplin County
“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.

- G. Poultry, North Carolina -----
Mountain Organic Materials (MOM) (#3.10)

Randy Johnson and David Parsons Farms, Wilkesboro, NC

“Demonstration of Poultry Manure and Mortality Forced Aeration Composting Bin Systems”

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

H. Poultry, Alabama-----

Renewable Oil, Inc. (ROI) (#3.07)

Mills Poultry Farm in Russellville, AL

“Demonstrating BioOil Technology for Poultry Litter Nutrient Management”

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

I. Poultry, Texas -----

RMG Strategies, Ltd and Microorganics (#3.11)

Jacobs Ranch in Carmine, TX

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

J. Dairy, Florida -----

AJT/Agrimond (#3.01)

Watson Dairy in Trenton, FL

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

K. Dairy, Wisconsin -----

Skill Associates – Phase I & II(#5.08)

Weise Farms in Greenleaf, WI

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

L. Dairy, Florida-----

Royal Consulting, Inc. (#4.01)

Butler Oaks in Lorida, Florida

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

M. Dairy, Florida -----

QED Occtech (#4.02)

Branford–DPS Dairy in High Springs, Florida

Report Status: The final report is currently under review to be re-posted on the FPPC website.

N. Dairy, Florida-----

Chemical Lime Co. (#3.04)

Aprile Dairy in Riverview, Florida

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

O. Swine, Iowa-----

Global Resource Recovery Organization, Inc. (#3.13)

Mobile Deployment System, Eldora, Iowa

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

- P. Dairy, Colorado -----**
Applied Chemical Magnesiums Corp. (ACM) (#3.12)
Bella Holsteins, Inc. in Platteville, Colorado
Report Status: The final report has been issued, reviewed, and posted on the FPPC website.
- Q. Dairy, Utah-----**
Utah State University (#5.4.04)
Blaine Wade Dairy near Ogden, Utah
Report Status: A final report has been issued, reviewed, and will be posted on the FPPC website.
- R. Dairy, Vermont-----**
AWS, LLC (#6.02)
North Williston Cattle Company (Whitcomb Farm)
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.
- S. Dairy, New York-----**
AWS, LLC (#5.05)
Noblehurst Farms
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.
- T. Dairy, Vermont -----**
BioProcess Technologies (#5.02)
North Williston Cattle Co.
Report Status: A final report has been issued, reviewed, and is posted on the FPPC website
- U. Swine, Illinois-----**
Envirowaste Technology, Inc. (#4.09)
Rensing Family Farms, Inc.
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.
- V. Swine and Dairy, Michigan-----**
Phase 3 Developments & Investments, LLC (#6.06)
Geerlings Hillside Farm
Report Status: A final report has been issued, reviewed and posted on the FPPC website.
- W. Dairy/Mixed Waste, California-----**
Agricultural Waste Solutions, Inc. (#5.06)
Inland Empire Municipal Site, Chino
Report Status: A final report has been issued, reviewed and posted on the FPPC website.

- X. Swine, North Carolina**-----
Super Soil Systems USA (#4.05)
Goshen Ridge Farms in North Carolina
Report Status: A final report has been issued and is currently under review.
- Y. Dairy, Ohio**-----
Crossroads RC&D / Wastewater Services, Inc. (#4.07)
Andreas Farm, Royer Farm
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.
- Z. Dairy, Virginia**-----
Virginia Dairymen's Association (#4.15)
D&D Dairy, Dayton, Virginia
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.
- AA. Dairy, Pennsylvania**-----
Nutrient Control Systems, Integrity (#5.07)
Mercer Vu Farms in Mercersburg, Pennsylvania
Report Status: The final report has been reviewed, issued and is posted on the FPPC website.
- AB. Dairy, Texas** -----
Reaction Energy Corp. (#4.16)
Fisher Dairy, Yantis, Texas
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.
- AC. Dairy, Florida** -----
Pretreatment Methods and Evaluation (#5.12)
Report Status: A final report has been drafted and is being reviewed.
- AD. Swine, Hawaii** -----
Limited Resource Farm – University of Hawaii (#6.13)
Janong Natural Farms, Kurtistown, Hawaii
Report Status: Final report is being reviewed for posting on FPPC website.
- AE. Poultry, Wisconsin** -----
R&J Partnershi[(#5.04)
Creekwood Farms, Lake Mills, WI
Report Status: Project report is being drafted.
- AF. Dairy, Florida** -----
White Technologies Inc – US Environmental Products Inc. (#5.09)
North Florida Holstein, Bell, FL
Report Status: Project report being drafted
- AG. Dairy, Florida** -----
FPPC Polymer Study (#5.09a)
North Florida Holstein, Bell, FL

Project Status: Project report is being written.

AH. Swine, Iowa -----

Puck Custom Enterprises (6.4.03)

Project Status: Awaiting report and review

AI. Swine, North Carolina -----

North Carolina A&T (#6.4.14)

University Farm, Greensboro, North Carolina

Report Status: A final report has been issued, and being reviewed.

AJ. Dairy, Florida -----

FPPC Effluent Treatment Methods (#6.07)

M&B Dairy, Lecanto, FL

Project Status: Final report is being written for Phase I.