



FPPC

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

July 15th, 2008

To: Mr. William Boyd - Leader, Manure Management Team
East National Technical Support Center - NRCS

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Re: Quarterly Report for period from April 1st through June 30th, 2008

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

During the second quarter of 2008, three of the five approved Limited Resource Farm applications were finalized. The remaining two projects are being finalized and should be initiated in the next quarter. FPPC is actively pursuing eleven (11) possible energy projects and will report status to the Board of Directors during the third quarter.

In April, FPPC conducted a briefing in Washington DC for congressional staff members. In May, FPPC hosted its fourth annual Technology Summit in St. Petersburg, Florida. Significant interest has been generated in linking nutrient management to energy conversion benefits.

In July, FPPC will present a paper at the Soil and Water Annual Conference and exhibit at Florida's Farm-to-Fuel Conference in Orlando.

OPERATIONS -----

A. Congressional Briefing: In April, FPPC conducted a congressional briefing in Washington DC. Technology providers from Wisconsin joined FPPC in DC to show support of the technology projects. A short video showcasing value added benefits of organic fertilizer and energy conversion was prepared to augment the FPPC presentation. The contemporary concern for energy has generated a renewed interest in capturing benefits from the animal waste stream. This video is now available online at www.fppcinc.org.

B. Technology Summit: Farm Pilot's 2008 Technology Summit proved to be the most rewarding yet. This year's theme, "Pathways to Energy" was punctuated with new enthusiasm from engineers, technology experts, academics, and various government participants who were anxious to advance their solutions to the animal waste problems on farms. Many of FPPC's technologies are now focused on bio fuels or the creation of energy byproducts derived from manure. These projects, along with others, were highlighted over the course of the day and a half conference. Those who participated were afforded the opportunity to network with key technology providers. At a hosted dinner at Tampa Bay Watch, participants were briefed on the environmental progress in the state's largest estuary – Tampa Bay.

FPPC provided five (5) virtual tours of projects sites in Wisconsin, California, Michigan, and Florida. These videos are accessible at the website and individual copies of specific presentations will be available upon request.

C. Energy Proposals: FPPC released a solicitation in April specifically outlining interest in solution sets for three potential waste-to-energy project categories. Funding of approximately \$1.8 million had been allocated by the Board of Directors during the first quarter. The three areas of waste-to-energy benefits include:

- i. Solids via pelletization
- ii. Storable liquid biofuels
- iii. Thermal conversion benefits for heating/cooling applications

FPPC has received eleven (11) applications, which are now being reviewed and evaluated. The status of the energy related initiatives will be reviewed at the next Board meeting scheduled in July.

D. Annual Single Act Audit: FPPC is nearing the end of its A-133 audit and inspection.

A. Progress at active pilot demonstration sites is briefly summarized below:

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Swine and Dairy, Michigan (#6.06)-----
Phase 3 Developments & Investments, LLC
Geerlings Hillside Farm

Process Description:

- Treatment of mixed animal waste from both swine and dairy
- A series of waste treatment technologies (i.e. screw press and dissolved air flotation) have been integrated with an anaerobic digester to provide a complete system
- Ultimately producing electrical power may be incorporated at a later date
- Pelletization and transport of nutrients off site to organic fruit farms and other potential end users

Project Status:

The challenge for the last three months has been in use of the waste heat for bio fiber drying, as the project is now focused on installing a new drying and storage area outside the building. Fibers will be conveyed through the wall onto a traveling auger, dropping onto the floor and turned once per day. The gensets will provide hot water for the floor of a 60 ft. long, 12 ft wide conditioning area, and transparent panels will allow for solar heating. Hot air will be blown across the top of the area and provide removal of moisture-laden air and ammonia through the soffits at the opposite end of the room. See pictures of installation below:



Once the bio fiber drying and storage area is completed, the pelleting operation will resume. California Pellet Mill recently visited the site to train and assist the project in pellet mill operations and maintenance.

Swine, Illinois (#4.09)-----
Envirowaste Technology, Inc.
Rensing Family Farms, Inc.

Project Description:

- Low pressure/multiple filling of geo-textile bags to dewater solids from the first stage of a three-stage lagoon system. This farm houses a 2000-head finishing unit in Illinois.
- The effectiveness of this separation method will be compared to manure derived from the storage pit and manure pumped from storage pond

Project Status:

The fourth bag filling and final event is scheduled for August 2008.

Poultry, Virginia (#4.06)-----
Virginia Polytechnic Institute and State University
Heatwole Poultry Farm

Process Description:

- Pyrolysis conversion of poultry litter to bio-fuel for on-site use
- Unit employs a fluidized bed and modern controls to operate the system

Project Status:

During the second quarter, Virginia Tech traveled to Golden, Colorado to finalize the control testing and modifications. In May, the pyrolysis unit was shipped to the poultry site in Virginia.

In June, FPPC and NRCS representatives conducted a site visit to evaluate the unit (see below). The system is now installed and in the startup phase. Currently the poultry litter will be brought to the Heatwole location and processed. The system was specifically designed to allow a trailer to attach underneath and become mobile for applications to other farms.



Pyrolysis Unit

Swine, Iowa (#4.03)-----
Puck Custom Enterprises (PCE)
Muhlbauer Farm
Greenflash II Farm
Langle Farm

Project Description:

Development and study of geotextile dewatering method using high pressure and rapid filling and metal salt/polymer flocculation. Comparative testing and evaluation is now being planned for three (3) separate swine sites in Iowa.

Project Status:

The project monitoring plan has been issued by Iowa State University for each of three farms participating in the project. Due to weather conditions, the projected first fill has been postponed until mid-August.

Dairy, Pennsylvania (#5.07) -----
Nutrient Control Systems
Mercer Vu Farms in Mercersburg, Pennsylvania

Process description:

- Upgrading and enhancing the existing nutrient management system, making waste treatment of manure user friendly and cost effective.
- Capability for fine sand removal, additional solids separation capability, conveyor, blower & controls, building expansion, windrow turner and curing pad sufficient to support a viable composting operation.

Project Status:

FPPC visited Mercer Vu Farms in June to observe the Integrity screw press and the Kemira band-pass filter being operationally compared and evaluated. Performance data is expected during the third quarter.



Waste processing is observed during site visit

Dairy, Vermont (#5.02) -----
BioProcess Technologies
North Williston Cattle Co.

Process description:

- The existing system incorporates a solid separator, a digester, composting capability and effluent treatment.

- The proposed project will take the biological effluent treatment to a new level of effectiveness by upgrading pretreatment of fine suspended solids and optimizing organic treatment in the bio-filter towers
- A high performance belt press will be installed as the primary solid separator

Project Status:

The targeted level of solid separation (suspended solids <1%) has been achieved with the AWS belt press system. Onsite treatment with lime however is complicating separation effectiveness. Startup of effluent treatment with the bio filter towers is now anticipated to begin in mid-August 2008.

**Dairy/Mixed Waste, California (#5.06) -----
Agricultural Waste Solutions, Inc.
Inland Empire Municipal Site, Chino**

Process description:

This project utilizes a regional model and a centralized location at the Inland Empire Utilities Agency site in Chino, California. Key elements of the pilot demonstration include the AWS centrifuge and gasification unit. The one-year testing program will test dairy, swine, beef, poultry, horse, digested sludge, food waste and mixes of wastes for their produced energy value. The demonstrations and tests will simulate a large range of farm waste systems, from high-volume flushes to dry-lot manure systems, in order to evaluate energy production, efficiency, costs, automation and maintainability. The improved centrifuge will remove moisture and is designed to uniformly condition the feed stock entering the gasifier.

The system consists of a skid-mounted centrifuge, a skid-mounted gasifier, an intermediate solids hopper, augers from the centrifuge to the hopper and from the hopper to the gasifier. The unique centrifuge removes 98% of the suspended solids with 70% moisture and is designed to uniformly condition the feedstock entering the gasifier. All equipment sits on a 25 by 35 foot concrete pad, with a gas compressor, expansion tank and storage tank located nearby. Utilities are plumbed to the pad, and the gasifier can run on either natural gas or its produced gas from the storage tank.

Project Status:

FPPC visited the site in April to document and film the virtual tour for the Technology Summit - which can now be found on the FPPC website (www.fppcinc.org). The project has been completed and a final report is anticipated by mid-August 2008.

**Poultry, Wisconsin (#5.04) -----
R&J Partnership
Creekwood Farms, near Madison
Weiss Poultry Farm in Kewaskum, Wisconsin**

Process description:

- Utilizes chicken manure and mortality carcasses, along with a carbon source for conversion into a stable, organic fertilizer derived from laying hen facility
- A bio-filter acts as a scrubbing mechanism to take out noxious odors associated with composting process.
- A key element in the process is the ammonia capture and the re-introduction of N into the final composting process.
- Leachate is collected in tanks and is re-used during the process. The net effect is that the process is optimized so that Nitrogen values remain elevated.

Project Status:

Additional monitoring sensors have been installed during the second quarter and a new test protocol was developed. FPPC anticipates that the containers will be loaded and fully operational during the third quarter of 2008.

Swine, North Carolina (#4.05) -----

**Super Soil Systems
Goshen Ridge Farms in North Carolina**

Process description:

- This 2nd generation technology system deploys a “mobile” solid separation capability

Project Status:

FPPC has advised Super Soil Systems it is not pursuing this project and is reviewing invoices associated with project initiation.

Dairy, New York (#5.05) -----

**AWS, LLC (formerly Nutracycle LLC)
Noblehurst Dairy Farm**

Project description:

This dairy project has approximately 1200 milking cows and is located in Linwood, New York. The farm owner has made a sizable investment in digester facilities and waste to energy capability. A belt press will be utilized to remove the bulk of the suspended solids coming from the digester.

Project Status:

FPPC conducted a site visit in June to observe the belt press in operation. The project has been evaluating the use of polymers and coagulating salts with the belt press. Preliminary findings are that successful results of solid separation and nutrient removal can be achieved with a single stage belt press operation, thus eliminating the need for a two stage belt press system. The project is expected to be completed and final report issued by August 2008.

Dairy, Vermont (#6.02) -----

**AWS, LLC (formerly Nutracycle LLC)
Belt press application**

Project status:

The project has been evaluating different waste stream/conditions by utilizing identical polymers, coagulating salts and techniques employed at Noblehurst Farms in New York.

Many complicating issues needed to be addressed due to the use of lime in the bedding at the farm. It was learned that the polymers would not perform effectively or predictably when the lime content was too high. However, when the farm ended the use of lime, the findings were that a level below 1% total suspended solids could be reached on a single stage belt. The project is now considered complete and a final report is expected during the third quarter.

**Dairy, Ohio (#4.07)-----
Crossroads RC&D / Wastewater Services, Inc.
Andreas Farm, Royer Farm**

Process description:

- microbial enhancement
- flushed and dry scrape dairy sites
- dewatering and complete solid separation
- package plant to treat effluent
- able to achieve nutrient and water quality levels acceptable for discharge

Project Status:

FPPC visited the Royer Farm in May to observe a portable belt press demonstrated by MSD Environmental Services, Inc. The press separated manure from the flush system at Andreas Farm and the scrape system at the Royer Farm. Actual test data is expected to be available by the end of July. This data will be evaluated to determine if the project should advance to the next phase of effluent operation and the intended "package plant" installation.

**Dairy, Florida (#5.09)-----
White Technologies Inc.
U.S. Environmental Products, Inc.
North Florida Holstein, Bell, Florida**

Process description:

- installation and development of solids removal capability via vacuum dewatering bed and polymer addition

Status:

The project was delayed in the first months of the year due to construction problems and air leaks in the concrete. This problem was determined to have occurred during the initial pouring and settling stage. In the meantime, leaks were sealed and other startup items with the

vacuum capability of pumping were addressed. The project is presently focused on evaluating polymer blending and mixing with the manure during filling. Routine filling and data gathering is expected in the third quarter.

Dairy, Texas (#4.16)-----
Reaction Energy Corp.
Fisher Dairy, Yantis, Texas

Process description:

- Development of struvite formation on a limited resource farm.
- Initial testing will provide a performance milestone for continuing the project.

Status:

All agreements have been signed and project is underway.

Dairy, Virginia (#4.15)-----
Virginia Dairymen's Association
D&D Dairy, Dayton, Virginia

Process description:

- Demonstrate and evaluate a high-efficiency screw press separator on a limited resource farm, to remove solids in conjunction with a struvite precipitation system to remove phosphorus from the liquid stream of the separated manure.

Status:

All agreements have been signed and project is underway.

Swine, Hawaii (#6.13)-----
University of Hawaii
Janong Natural Farms, Kurtistown, Hawaii

Process description:

- Pigs will be housed on green litter for a limited resource farm.
- Liquids will be absorbed by green waste material
- Project will identify the primary indigenous microorganisms
- Economic analysis of construction and design of a solar and naturally ventilated facility in Hawaii.

Status:

All agreements have been signed and project is underway.

Swine, North Carolina (#4.14)-----
North Carolina A&T
University Farm, Greensboro, North Carolina

Process description:

- Process will evaluate solid separation, effluent treatment and polishing agents as currently designed for a limited resource farmer.

Status:

FPCC continues to work with the technology provider to define the multiple stages of the proposed project as well as the levels of participation from third party vendors.

Attachment A

Final report status of sixteen 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 Microgenics (#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 is currently under review.
- 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 submitted and is currently under review.