

# Southern Animal Manure and Waste Management Quarterly



E-Newsletter  
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Dr. Sanjay Shah, Editor

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*Animal Waste management research and education efforts are needed to address major regional problems associated with livestock and poultry waste. The multi-state, multi-agency Animal Waste Management Workgroup is prioritizing needs and designing collaborative programs to support coordinated research and development of educational resources.*

## Animal Waste Management Program

The Animal Waste Management Program is one of 12 priority program areas identified by the Southern Region Water Quality Planning Committee. A multi-disciplinary regional workgroup of animal waste management experts is improving animal waste management recommendations to enhance both economic and environmental outcomes in threatened and impaired watersheds. Through strengthened regional and multi-agency collaboration, the workgroup identifies gaps in knowledge and resources, defines significant research needs, and conducts strategic planning to develop appropriate educational and technology transfer tools.

This newsletter is an outlet for sharing and showcasing success stories and products from the Animal Waste Management Program. It will be posted to <http://srwqis.tamu.edu> quarterly in pdf and WORD formats. Questions or comments may be directed to the team leaders or the appropriate state contact.

### Contacts

**Dr. Mark Risse**  
University of Georgia  
520 Driftmier Engineering Center  
Athens, GA 30603  
Phone: 706-542-9067  
Fax: 706-542-1886  
[mrise@engr.uga.edu](mailto:mrise@engr.uga.edu)

**Dr. Karl VanDevender**  
University of Arkansas  
2301 South University Ave., Rm 305K  
Box 391  
Little Rock, AR 72203  
Phone: 501-671-2244  
Fax: 501-671-2303  
[kvan@uaex.edu](mailto:kvan@uaex.edu)



### *Animal Waste Management Program Team*

<b>Mark Risse, Program Chair</b>	University of Georgia
<b>Karl VanDevender, Program Co-Chair</b>	University of Arkansas
Ted Tyson	Auburn University
Edmund Buckner	University of Arkansas at Pine Bluff
Rao Mylavaram	University of Florida
Cass Gardner	Florida A&M University
Nathaniel Brown	Fort Valley State University
Monroe Rasnake	University of Kentucky
Matt Stevens	Louisiana State University
Jim Thomas	Mississippi State University
Sanjay Shah	North Carolina State University
G.B. Reddy	North Carolina A&T State University
Robert Flynn	New Mexico State University
Doug Hamilton	Oklahoma State University
George Dabai	Langston University
John Chastain	Clemson University
Kristy Hill	University of Tennessee
Sam Dennis	Tennessee State University
Sam Feagley	Texas A&M University
Nelson Daniels	Prairie View A&M University

### **Status Report on the Development of ‘Environmentally Superior Technologies’ for Treating Swine Waste in North Carolina**

**C.M. (Mike) Williams, Director, Animal and Poultry Waste Management Center, NC State Univ.**

Research efforts to identify and implement “Environmentally Superior Technologies” (EST) were initiated in 2000 by the Attorney General of North Carolina by an agreement with Smithfield Foods and its subsidiaries, and a similar agreement with Premium Standard Farms. A third agreement was established between the Attorney General of North Carolina and Frontline Farmers in 2002.<sup>1</sup>

Performance standards defined in the Agreements, and previously established by the North Carolina General Assembly<sup>2</sup>, mandate that successful EST address environmental variables including the discharge of animal waste to surface waters and groundwater; emission of ammonia; emission of odor; release of disease-transmitting vectors and airborne pathogens; and nutrient and heavy metal contamination of soil and groundwater. Comprehensive determinations of economic feasibility are also mandated by the Agreements. Targeted economic variables include projected 10-year annualized cost for each technology; projected revenues from byproduct utilization; available cost-share monies; and the impact that the adoption of the EST may have on the competitiveness of the North Carolina pork industry as compared to the pork industry in other states.

<sup>1</sup> See Agreements between Attorney General of North Carolina and, SF, PSF, and Frontline Farmers (North Carolina Department of Justice, on file with Ryke Longest, 2000 & 2002). Also available at [www.cals.ncsu.edu/waste\\_mgt/](http://www.cals.ncsu.edu/waste_mgt/)

<sup>2</sup> See General Assembly of North Carolina, Session 1997, Session Law 1998-188, House Bill 1480

Candidate EST technologies were competitively selected. They included solids separation systems, a covered in-ground anaerobic digester with biological trickling filters and greenhouse vegetable production, mesophilic and thermophilic anaerobic digesters, a sequencing batch reactor, an upflow biological aerated filter system, a gasification system, belt manure removal systems, and wetland systems. In addition to these systems, technologies not funded directly by this initiative but under development by Smithfield Foods in Utah (bio-fuel from manure project), Premium Standard Farms in Missouri (several technologies per a consent agreement between Premium Standard Farms and the state of Missouri and USEPA), Sustainable North Carolina and Frontline Farmers (closed loop swine waste management system located in eastern North Carolina) are being followed as potential EST. Detail progress reports describing the EST initiative between the dates of July 25, 2000 and July 25, 2003 have been published.<sup>3</sup> On July 26, 2004 a Technology Determination Report was issued.<sup>4</sup> The Technology Determination Report, as described in the Agreements, comprises “a written determination that contains a finding relative to a technology or combination of technologies candidacy as an Environmentally Superior Technology or Technologies”. In brief, the referenced July 26, 2004 report focused on 8 of the candidate EST that were targeted for an initial (Phase 1) technology determination. Quantitative descriptions of the environmental performance standards, and how they were determined, are also described and discussed in the July report. Two of the technologies considered in the Phase 1 determinations were shown to be capable of meeting the Agreements’ environmental performance standards that define an Environmentally Superior Technology. Those technologies are: 1) the solids separation / nitrification–denitrification / soluble phosphorus removal system (“Super Soils” technology) and 2) the high solids anaerobic digester system (“ORBIT” technology). The data also indicates that, with technical modifications and/or combination of some of the technology unit processes, additional technologies considered in the Phase 1 determinations may meet the technical performance criteria.

For the mandated economic analysis, projected costs of retrofitting existing lagoon spray-field systems have been estimated for the eight Phase 1 candidate technologies. The impacts of adopting those technologies on the competitiveness of the NC pork industry have also been projected. These data, and the methods utilized to derive them, are currently under review and final reports will be released later in 2005.

The projected schedule is to conclude the technical performance and economic feasibility analysis for all candidate technologies in 2005. Description of the technologies and objective data progress reports will continue to be available and updated at [www.cals.ncsu.edu/waste\\_mgt](http://www.cals.ncsu.edu/waste_mgt).

## **CAFO Compliance Flags**

### **Ted Tyson, Auburn University**

What are Concentrated Animal Feeding Operation (CAFO) Compliance Flags? Simply put, these are things on any CAFO that "Flag" the attention of anyone looking at the operation of that CAFO. And who might be looking at CAFO operation? That's right, the EPA or your state regulatory agency responsible for enforcement of CAFO regulations in your state.

If we have an idea where the inspectors may be looking, we can give attention to those areas and try to be prepared for their visit. CAFO Compliance "FLAGS" will vary somewhat from state to state but in the Southeast, at least, these might fall into five general categories that are discussed below.

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<sup>3</sup> See Development of Environmentally Superior Technologies: One, Two, and Three Year Progress Reports, published by NCSU College of Agriculture and Life Sciences, on file with NCSU Animal and Poultry Waste Management Center (July 25, 2001; 2002; 2003). Also available at [www.cals.ncsu.edu/waste\\_mgt/](http://www.cals.ncsu.edu/waste_mgt/)

<sup>4</sup> See Development of Environmentally Superior Technologies: Phase 1 Technology Determination Report, published by NCSU College of Agriculture and Life Sciences, 941 pp, on file with NCSU Animal and Poultry Waste Management Center (July 26, 2004). Also available at [www.cals.ncsu.edu/waste\\_mgt/](http://www.cals.ncsu.edu/waste_mgt/)

### 1. *Manure/Litter Storage Capacity*

- Is the waste storage pond or lagoon or the litter storage shed full or close to full entering the winter months?
- Are there less than 180 days of storage available on November 1?
- Does the storage pond or lagoon have the required depth for freeboard and 25-year, 24-hour storm for your location?
- Does clean water or non-production area runoff enter the manure/litter storage area?
- Are clean water diversions, roof gutters and waterways poorly maintained?
- Do records show recent increases in animal population?
- Does the liquid storage have a visible staff gauge labeled with maximum capacity level?

**If your answer to any of the above "Flag" questions is "yes" (except the last one), you need to look closer to see if there is a problem!** Use your WRITTEN Waste Management System Plan, Comprehensive Nutrient Management Plan, Manure Management Plan, or Nutrient Management Plan, (whatever your state calls the written plan required for CAFO registration) to take a closer look at each of these "Flags".

### 2. *Manure Utilization*

- Do application records show manure, wastewater or litter being applied to highly erodible soils, wetlands, etc? Does the waste management plan need to be modified to include this application to highly erodible soils?
- Are there evidences of any manure, wastewater, or litter leaving the field edge?
- Are there "temporary field storage" piles of manure/litter in any application field? Do these have adequate cover?
- Is a berm needed around the temporary field storage pile? Does any runoff from temporary field storage piles reach surface waters?
- Is manure, wastewater, or litter applied during rainy, wet weather? When the soil is saturated, or when tile drains are running? When the ground is frozen?
- Are there any indications of too much or too little manure, wastewater, or litter application?
- Is there any evidence of manure or litter piling or wastewater ponding in an application field?
- Is there any evidence of clean water diversions in an application field being poorly maintained? Overtopping?
- Is there any evidence of manure, wastewater, or litter application within 50 ft of drains, ditches, or wetlands served by diversions?
- Any evidence that grass, vegetative, or forested buffers between cropland & surface waters need maintenance (stand improvement, etc.)?
- Any leaks from permanently installed manure application & handling equipment, risers, or pipes?
- Do silage bunkers present have berms to divert clean water & collect run-off? Any evidence of silage drainage to surface water?
- Are any stream banks eroded due to unrestricted cattle access to streams?
- Does the actual facility layout match the layout in the NMP?

**If your answer to any of the above "Flag" questions is "yes" (except the last one), you need to look closer to see if there is a problem!** Use your waste management plan and the laws in your state to guide a closer look at each of these "Flags".

### 3. *Additional BMPs to Protect Water Quality*

- Is animal mortality management specifically addressed in the NMP?
- Do animal-mortality-handling structures and equipment appear to be sized correctly?
- Are any dead animals/ birds or body parts visible?

- Are daily/weekly records of mortality management kept up-to-date?
- Do floor drains in milking parlors collect process wastewater? Is this floor-drain-collected wastewater directed to a liquid storage structure? Does the liquid storage structure capacity include this wastewater?
- Any floor drains next to chemical footbaths?

**If your answer to any of the above “Flag” questions is “no” (except the last one), you need to look closer to see if there is a problem!** Use your waste management plan and the laws in your state to guide a closer look at each of these “Flags”.

#### 4. *Proper Operation/Maintenance of Manure/Litter and Wastewater Storage & Handling Systems*

- Any evidence of erosion (manure inlet, agitation equipment, or rainfall) on inside of earthen storage structure?
- Is access for manure liquid and solids removal equipment inadequate?
- Do service roads or areas in front of litter storages need improvement for all-weather use?
- Do earthen embankments have burrowing animals? Trees? Large weeds? Erosion or gullies? Poorly established sod/vegetation? Heavily cracked sidewalls? Damp or soft places on the embankments? Seepage near the embankment "toe"? Pooling on lowest side of embankments?
- Do concrete or steel manure storage tanks have cracks or structural damage? Leakage or evidence of leaking? Wet spots around base of tank? Backflow prevention equipment on pipe to an elevated manure storage tank?

**If your answer to any of the above "Flag" questions is "yes" (except the last one), you need to look closer to see if there is a problem!** Use your waste management plan and the laws in your state to guide a closer look at each of these "Flags".

#### 5. *Record Keeping and Testing*

- Is a written Operation & Maintenance Plan maintained and available to key employees covering manure storage operation and maintenance? How to inspect storage facilities? An emergency response plan?
- Do you routinely test manure/litter and wastewater for nutrient content? Do you file these tests and use them to guide land application?
- Do you soil test each application field according to the requirements of your state regulatory agency? Do you file these tests and use them to guide land application?
- Does your facility have written spreading agreements for non-owned or non-leased application sites?
- Are land application and operation records complete and up-to-date (including composted mortality)?
- Are written ownership transfer records kept of any manure, wastewater, or litter sold or given away for use on property NOT controlled by the producer? Are these available and up-to-date?

**If your answer to any of the above "Flag" questions is "no", you need to look closer to see if there is a problem!** Use your waste management plan and the laws in your state to guide a closer look at each of these "Flags".

(This article was adapted from NPDES CAFO Compliance Flags, Session 3C, Technical Fundamentals of CAFOs for Permit Writers and Inspectors, USEPA Office of Compliance and Office of Wastewater Management, presented by EPA Region 4 in Atlanta GA, September 27-30, 2004.)

## **Court Ruling May Force Changes in EPA's CAFO Regulations** **Monroe Rasnake, University of Kentucky**

A ruling by the U. S. Court of Appeals for the 2<sup>nd</sup> Circuit on February 28 may force some changes in the 2003 EPA regulations regarding CAFOs. Some of the most significant rulings include:

1. CAFOs that do not discharge wastes directly to waters of the US may not be required to obtain NPDES permits.
2. Increased the significance of nutrient management plans (NMPs) by making them a legal part of permits; subject to public review; and reviewed "in-depth" by the permitting agency.
3. The regulation must do more to address control of pathogens in animal waste.
4. EPA must clarify and justify the 100 year – 24 hour storm event design requirement for swine and poultry CAFOs.

While it is too early to tell the exact impacts of this ruling, it is expected that EPA will have to revise and re-issue these rules. The full text (65 pages) of the ruling is available on the web at:

<http://srwqis.tamu.edu/downloads/CAFO%20court%20decision.pdf>.

## **Upcoming Events and Announcements**

### National - International

- [Seventh International Livestock Environment Symposium, May 18-20, Beijing, China](#)
- [ASAE Annual International Meeting, July 17-20, Tampa, FL](#)
- [2005 Animal Waste Management Symposium, October 5-7, Raleigh, NC](#)

### Statewide – Regional

- [Florida](#)
  - IFAS/NRCS Nutrient Management Training for TSPs, May 3-5, Okeechobee, FL
- [Georgia](#)
  - Nutrient Management Planner Certification, May 10-11, Macon, GA
  - Georgia SWCS Annual Meeting, Technical Session on Poultry Litter Brokering, June 16-17, George Bagby State Park, GA ([mrise@engr.uga.edu](mailto:mrise@engr.uga.edu))
- [North Carolina](#)
  - Multiple trainings on animal waste systems offered throughout the year in Raleigh, NC
- Southern Region Extension Water Quality Meeting, [4 Sessions and Workshops on Animal Waste Management](#), October 24-26, Lexington, KY.