



Steve Troxler
Commissioner

North Carolina Department of Agriculture
and Consumer Services
Division of Soil and Water Conservation

Patricia K. Harris
Director

December 12, 2012

Mr. Bill Reck
USDA-NRCS - ENTSC
200 E. Northwood, Suite 410
Greensboro, NC 29401

Dear Bill:

Attached is the final report for NRCS Agreement No. 68-3A75-7-111, Innovative Mortality Management Tools for Animal Agriculture Industries.

The Innovative Mortality Management project has been a very successful project. Innovative systems were installed on eleven farms through the project, and several field days were held to share the technologies with other interested producers. The Division continues to promote innovative mortality management technologies, and is offering a special state cost share allocation to innovative poultry mortality management systems at present.

The Division is extremely grateful to USDA-NRCS for awarding the grant to support the project, and hopes to cooperate again in the future on similar innovative projects.

Please let me know if additional information is needed. I can be reached at 919-715-6103 or by email at David.B.Williams@ncagr.gov.

Sincerely,

David B. Williams, Deputy Director

MAILING ADDRESS
Division of Soil and Water Conservation
1614 Mail Service Center
Raleigh, NC 27699-1614

Telephone: 919-733-2302
Fax Number: 919-733-3559

LOCATION
Archdale Building
512 N. Salisbury Street, Suite 504
Raleigh, NC 27604

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**Conservation Innovation Grants
Project Final Report**

Agreement Number: 69-3A75-7-111
Grantee Name: NC Division of Soil and Water Conservation
Project Title: Innovative Animal Mortality Management
Project Director: David B. Williams
Contact Information: 919-715-6103
Project End Date: September 28, 2011

Summarize the work performed during the project:

Implementation of Innovative Mortality Management Systems:

The Division of Soil and Water Conservation worked with eleven (11) EQIP eligible producers in North Carolina to demonstrate innovative mortality systems through the course of this project. Three different types of innovative technologies were implemented: forced air composter (3 systems installed); Biovator rotary composter (2 systems installed); and Gasification (6 systems installed). Nine of the producers who participated in the project were poultry growers, and two were swine producers. \$153,000 of CIG funds were applied to support implementation of these systems, and these funds were matched by \$298,793 of state cost share funds and \$176,809 of cooperator funds. Table 1 shows the eleven farms included in the project.

Table 1: EQIP Eligible Farms that Participated in Installing Innovative Mortality Management Systems

Farm Name	County	Type of Operation	CIG Grant Funds	State Cost Share Funds	Farmer funds	Cumulative Match Funds
Henry Moore Farm	Sampson	Swine	\$51,000	\$15,000	\$49,000	\$64,000
Julian Barham Farm	Johnston	Swine	\$51,000		\$17,000	\$17,000
David Etheridge Farm	Harnett	Poultry		\$27,009	\$9,003	\$36,012
Thomas Braswell Farm	Edgecombe	Poultry		\$25,736	\$8,579	\$34,315
Cecil Waller Farm	Onslow	Poultry		\$31,446	\$10,482	\$41,928
Lloyd Harris Farm	Wilkes	Poultry		\$46,713	\$15,571	\$62,284
Allen's Livestock	Edgecombe	Poultry		\$30,309	\$10,103	\$40,412
Randy Gray Farm	Wayne	Poultry		\$50,298	\$16,766	\$67,064
William Everett Farm	Martin	Poultry		\$21,984	\$7,328	\$29,312
Manfred Hood Farm	Wayne	Poultry		\$50,298	\$16,766	\$67,064
Dale White Farm	Alexander	Poultry	\$51,000		\$16,211	\$16,211
Total Funds Expended			\$153,000	\$298,793	\$176,809	\$475,602

Figures 1 and 2 are photographs of the completed forced air composter and dry stack on the Dale White Farm. It is very apparent that the composter is capable of reaching and sustaining temperatures for effective pathogen kill.

Figure 3 is a photograph of the Biovator rotary drum composter on the Henry Moore Farm, and Figure 4 is a photograph showing a gasification system and freezer for a small poultry operation similar to those installed under this project.



Figure 1: Completed forced air composter on the Dale White Farm before it was used.



Figure 2: Dale White Farm composter being loaded.



Figure 3: Biovator rotary composters on the Henry Moore Farm.



Figure 4: 400 lb. Gasification System with mortality freezer.

Five Producer Workshops Held

The Division partnered with technology providers and local soil and water conservation districts to hold five mortality management workshops across the state. The locations and subject of the field days are shown in Table 2 below.

Table 2: Producer Workshops Dates and Locations

Workshop Location	Date	Sponsors	Technologies Shown	Estimated Number of Attendees
White Farm – Alexander County	January 8, 2010	Advanced Composting Technologies, Alexander SWCD, NRCS	Forced air composter	30
Dennis Raynor Farm – Johnston County	January 12, 2010	Advanced Composting Technologies, Johnston SWCD, NRCS	Forced air composter	25
Lacy Cummings Farm – Robeson County	January 13, 2010	Advanced Composting Technologies, Robeson SWCD, NRCS	Forced air composter	25
Julian Barham Farm – Johnston County	May 25, 2010	NC Cooperative Extension Service	Biovator Rotary composter	35
Multiple Farms – Wayne County		Wayne SWCD, DSWC	Biovator Rotary composter, Forced Air composter	

Figure 5 is a photograph from the field day on the White Farm.



Figure 5: Producer field day at the White Farm in Alexander County.

Attached to this report are the announcements about the three field days hosted by Advanced Composting Systems and the field day hosted by the Wayne Soil & Water Conservation District.

Division staff also participated in a farm field day on May 25, 2010 at the Julian Barham Farm where one of the Biovator composters has been installed. The Biovator was featured on the farm tour. Approximately 35

people participated in the field day. Forced air composters were also discussed on the field day as another innovative alternative to traditional mortality management systems (incineration and burial).

Describe significant results, accomplishments, and lessons learned. Compare actual accomplishments to the project goals in your proposal:

The initial plan for this project was to install mortality gasification systems for managing swine mortalities. However, shortly following the beginning of the project, we began to hear some concerns about the fuel efficiency of the gasification systems. In November 2007, the Division saw a demonstration about the Biovator technology, and it was approached by some farmers about implementing this technology. This technology offers the advantage of not requiring a significant quantity of fuel to treat the mortalities. The Henry Moore Farm and the Julian Barham Farm are very pleased with the results of the Biovator, thus far.

We also planned to demonstrate forced aeration composters for swine operations. However forced aeration composters have now been installed on several swine farms in North Carolina, so the innovative aspect of the traditional application this technology has diminished. The traditional application involves constructing the bins and floor in-place, which is quite expensive. We worked with Advanced Composting Technologies, Inc., to demonstrate the technology using a pre-fabricated construction approach, which should result in a significant reduction in cost of the systems. The initial pre-fab construction approach was successful for this application, but the company developed some other modifications that will help to further lower the costs and customer satisfaction with the pre-fab construction approach. The company is already making plans to scale up pre-fab approach for application on swine operations.

Biomass Marketing Systems, the supplier for the gasification systems, has been working with farmers where their systems have been installed to modify their hearth grates to improve the fuel efficiency. Some improvement in efficiency has resulted, but work continues. The company has also made some modifications to some of its larger freezer units to make it easier to insert and remove mortalities.

The Division also planned to install a forced aeration compost system on a beef or dairy operation. However, we learned that the NC State Veterinarian would not be willing to grant a permit for a cattle composting operation due to the inability of the composting operation to reach the high temperatures necessary to destroy Bovine Spongiform Encephalopathy (BSE) prions.

We switched our focus more toward gasification systems for managing cattle mortalities, but the cost of the systems and of fuel has made this option unattractive..

We plan to approach a poultry farmer who is interested in trying out another rotary composting system for poultry, the Ecodrum system. Several farmers have approached local soil and water conservation districts about trying this system.

In the space below, provide the following in accordance with the Environmental Quality Incentives Program (EQIP) and CIG grant agreement provisions:

1. A listing of EQIP-eligible producers involved in the project, identified by name.

Farm/Producer Name	County	Type of Operation
Henry Moore Farm	Sampson	Swine
Julian Barham Farm	Johnston	Swine
David Etheridge Farm	Harnett	Poultry – Broilers
Thomas Braswell Farm	Edgecombe	Poultry – Broilers
Cecil Waller Farm	Onslow	Poultry – Broilers
Lloyd Harris Farm	Wilkes	Poultry – Broilers
William Everett Farm	Martin	Poultry – Broilers

Manfred Hood Jr. Farm	Wayne	Poultry – Broilers
Randy Gray Farm	Wayne	Poultry – Broilers
Tony Mathis Farm	Wilkes	Poultry – Broilers
Allen’s Livestock	Edgecombe	Poultry – Broilers
Dale White Farm	Alexander	Poultry - Broilers

2. **The dollar amount of any direct or indirect payment made to each individual producer or entity for structural, vegetative, or management practices. Both semiannual and cumulative payment amounts must be submitted.**

Farm Name	County	Type of Operation	CIG Grant Funds	State Cost Share Funds
Henry Moore Farm	Sampson	Swine	\$51,000	\$15,000
Julian Barham Farm	Johnston	Swine	\$51,000	
David Etheridge Farm	Harnett	Poultry		\$27,009
Thomas Braswell Farm	Edgecombe	Poultry		\$25,736
Cecil Waller Farm	Onslow	Poultry		\$31,446
Lloyd Harris Farm	Wilkes	Poultry		\$46,713
Allen’s Livestock	Edgecombe	Poultry		\$30,309
Randy Gray Farm	Wayne	Poultry		\$50,298
William Everett Farm	Martin	Poultry		\$21,984
Manfred Hood Farm	Wayne	Poultry		\$50,298
Dale White Farm	Alexander	Poultry	\$51,000	
Total Funds Expended			\$153,000	\$298,793

3. **A self-certification statement indicating that each individual or entity receiving a direct or indirect payment for any structural, vegetative, or management practice through this grant is in compliance with the adjusted gross income (AGI) and highly-erodible lands and wetlands conservation (HEL/WC) compliance provisions of the Farm Bill.**

This is to certify that each individual or entity who has received a direct or indirect payment through this grant is in compliance with the adjusted gross income (AGI) and highly-erodible lands and wetlands conservation (HEL/WC) compliance provisions of the Farm Bill.

Potential for Transferability of Results

The technologies demonstrated in this CIG grant project have high potential for transferability. Both forced air composters and mortality gasification systems have been added to the North Carolina Agriculture Cost Share Program, and the forced air composters are also eligible for funding in North Carolina through the state EQIP program.

Conclusions

The Innovative Mortality Management project has been a very successful project. Innovative systems were installed on eleven farms through the project, and several field days were held to share the technologies with other interested producers. The Division continues to promote innovative mortality management technologies, and is offering a special state cost share allocation to innovative poultry mortality management systems at present.

The only disappointment was that we were unable to implement a demonstration project for a cattle/dairy operation due to concerns about fuel prices for gasification systems and bovine spongiform encephalopathy for composting systems.

The Division is extremely grateful to USDA-NRCS for awarding the grant to support the project, and hopes to cooperate again in the future on similar innovative projects.



Advanced Composting TECHNOLOGIES



Forced Air Composting Specifically Designed for Animal Agriculture

Mr. Dale White, Kathy Bunton w/ NC Cooperative Extension Service, Alexander Soil and Water Conservation District, USDA-NRCS, and Advanced Composting Technologies (ACT) would like to invite you to join us in a field day to witness poultry mortality composting as you have never seen it before!

When: Friday- January 8th, 2010 at 1:00 pm

**Where: Alexander Soil and Water District Office and Dale White Farm
374 First Ave. S.W.
Taylorsville, NC 28681**

Directions: Off I-40 take Exit 148 and go approx. 20 miles west toward Taylorsville on US 64/NC-90. Turn right onto NC-16 North. Stay on NC-16 to T-bone intersection, turn left onto NC-90/W. Main Ave./NC-16N. Church will be 0.2 miles on left. NRCS-SWCD/ Coop. Extension Office is adjacent to the church parking lot. See attached directions for other routes.

For more information contact:

Kathy Bunton, NC Coop. Extension Service (704) 873-0507

Lee Holcomb, Alexander Soil and Water Conservation District (828)-632-2708

Ronnie Howard, Advanced Composting- (828) 989-3705



- 10 Years of Proven Results
- Not Fossil Fuel Dependent
- Lower Operation Cost
- Minimal Odor
- Pathogen Free Compost
- Solid 20 years of Performance
- Composter works great for hogs, turkeys, and poultry



Advanced Composting TECHNOLOGIES



Forced Air Composting Specifically Designed for Animal Agriculture

Mr. Dennis Raynor, Johnston Soil and Water Conservation District, USDA-NRCS, and Advanced Composting Technologies (ACT) would like to invite you to join us in a field day to witness swine mortality composting as you have never seen it before!

When: Tuesday - January 12th, 2010 at 1:00 pm

Where: Dennis Raynor Farm

315 Westbrook Lowgrounds Road

Four Oaks, NC 27524

Directions: In Newton Grove take Hwy. 701 north. Go approx. 2.5 miles (cross into Johnston Co.) and take a right on Harper House Road at the brown Bentonville Battlefield sign. Go approx. 5.3 miles and take a left on Devils Racetrack Road. Go 1.2 miles and turn right at stop sign. Go approx. 1.1 miles and take a right on Westbrook Lowgrounds Road. Go 1/3rd mile and turn left into the Raynor Farm.

For more information contact:

Jerry Raynor, USDA- NRCS @ (919) 934-7156

Ronnie Howard, Advanced Composting@ (828) 989-3705



- **10 Years of Proven Results**
- **Not Fossil Fuel Dependent**
- **Lower Operation Cost**
- **Minimal Odor**
- **Pathogen Free Compost**
- **Solid 20 years of Performance**
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Advanced Composting

LOGIES



Forced Air Composting Specifically Designed for Animal Agriculture

Mr. Lacy Cummings, USDA NRCS, Robeson Soil and Water Conservation District, NC Coop. Extension Service and Advanced Composting Technologies (ACT) would like to invite you to join us in a field day to witness poultry mortality composting as you have never seen it before!

When: January 13th, 2010 at 1:00 pm

**Where: Lacy Cummings Farm
1153 Townsends Chapel Road
Pembroke, NC 28372**

Directions: Off I-95 take Exit 17 toward Pembroke/Red Springs and go north, take a right at traffic light on Highway 72 for 18.2 miles. Take a right on Townsends Chapel Road, go .2 mile and take a right into farm road at field day signs. (Stop at Bio-security station before accessing the operation.)

For more information contact:

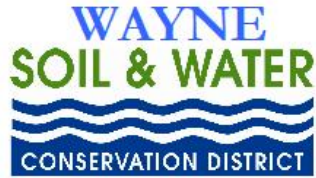
Jeremy Roston, District Conservationist NRCS- (910) 739-5478 ext. 3

Ronnie Howard, Advanced Composting- (828) 989-3705

Keith Warren, Advanced Composting- (828) 230-1729



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208 WEST CHESTNUT STREET
 GOLDSBORO, NC 27530
 PHONE: (919) 734-5281, Ext. 3



A special **THANK YOU** to the Division of
 Soil & Water Conservation for sponsoring
 the meal



MORTALITY TOUR NOVEMBER 15, 2010 GOLDSBORO, NC 27530



8:00—8:15 A.M.	Registration (Wayne Center)	11:30 A.M.	Tour Randy Alan Gray's 80,000 Broiler Forced Air Composter (Keith Warren)
8:20 A.M.	Depart for Bryant Worley's Swine Biovator	12:00 Noon	Depart to Wayne Center For lunch
8:40 A.M.	Tour Bryant Worley's 5760 Feed to Finish Biovator (Henry Moore)	12:20—1:20 P.M.	Lunch
9:20 A.M.	Depart for Bryant Worley's Poultry Biovator	1:30 P.M.	Depart for Doug Jernigan's Poultry Static Composter
9:30 A.M.	Tour Bryant Worley's 28,495 Heavy Tom Biovator (Henry Moore)	1:50 P.M.	Tour Doug Jernigan's 56,000 Heavy Tom Poultry Static Composter (Dean Bingham)
10:00 A.M.	Depart for Andy Ballance's Poultry Forced Air Composter	2:30 P.M.	Depart for Doug Jernigan's Swine Static Composter
10:30 A.M.	Tour Andy Ballance's 24,000 Heavy Tom Forced Air Composter (Keith Warren)	2:40 P.M.	Tour Doug Jernigan's 2,000 Farrow to Finish Swine Static Composter
11:10 A.M.	Depart for Randy Alan Gray's Poultry Forced Air Composter	3:00 P.M.	Questions & Answer's
		3:20 P.M.	Travel back to Wayne Center
		3:40 P.M.	Arrive Back at Wayne Center