



Delaware Nutrient Management Commission

April 1, 2009



Introduction

2008 was an important year for nutrient management. It was the second year for full implementation of the Law and also turned out to be the year of scrutiny. The accountability demonstrated last year was significant and must continue in order for agriculture and a growing population to co-exist. This accountability is the result of many voluntary and regulatory programs throughout the state, a combination that works well in Delaware.

The Nutrient Management Law mandated that all farmers and other nutrient handlers develop and implement phosphorus limited nutrient management plans, maintain nutrient handling records, maintain nutrient certification and submit an annual report. Voluntary programs comprise of many practices offered by the County Conservation Districts, Natural Resources Conservation Districts (NRCS) and stand alone initiatives by the property owners, farmers and nutrient handlers across the state.

The scrutiny consists of a record number of Environmental Protection Agency (EPA) inspections and farm visits. EPA has stated that nutrient runoff from agriculture is a priority within Delaware and the Delmarva Peninsula due to water quality impairments and the concentration of poultry farms. In addition to EPA, organizations such as the Waterkeeper Alliance and the Chesapeake Bay Foundation have scrutinized the accountability of nutrient runoff and in some cases, proceeded with litigation for more regulations.

The implementation progress illustrated in this annual report demonstrates that nutrient handlers are making significant improvements in reducing nutrient runoff. Animal feeding operations, row crop farmers, horse operations, golf courses and lawn care companies are implementing nutrient management and demonstrating accountability. The following sections fulfill the reporting requirement to the Governor and the General Assembly as stated in the Nutrient Management Law. Additional information is included to represent measurable results and accountability for nutrient handlers, poultry companies, agricultural agencies and the Nutrient Management Commission (Commission).

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Organizational Purpose

The organizational structure of the Nutrient Management Program is important and critical as budget shortfalls within state government are present and difficult decisions are needed.

The mission of the Commission and Program is "To manage those activities involving the generation and application of nutrients in order to help improve and protect the quality of Delaware's ground and surface waters, sustain and promote a profitable agricultural community, and to help meet or exceed federally mandated water quality standards, in the interest of the overall public welfare." In order to accomplish this mission, the following strategic goals are in place:

Strategic Goals

1. Promote alternative use practices for excess nutrients generated in Delaware by developing and implementing incentive and market-based programs.
2. Implement nutrient management certification requirements by providing nutrient handlers with initial and continuing educational opportunities.
3. Implement the state's National Pollutant Discharge Elimination System (NPDES) Permitting program for concentrated animal feeding operations (CAFO) in cooperation with the Department of Natural Resources and Environmental Control and according to the Clean Water Act and Federal regulations.
4. Institute a program to assist in developing and funding nutrient management plans according to law and program standards.
5. Audit nutrient management activities to instill legal compliance and high quality services.
6. Respond to informal and formal complaints against nutrient management practices.
7. Recognize environmental stewards within the agricultural community with the cooperation and financial support of the agri-businesses and poultry companies operating within the state.
8. Develop and implement demonstration projects within the farm community for best management practices.
9. Facilitate and actively fund research projects according to priorities that will better balance science-based policy development with modern and responsible nutrient management practices.

	FY2008 Actual	FY2009	FY2010
Tons of poultry litter-manure relocated within Delaware for land application	29,053	25,000	25,000
Tons of poultry litter-manure exported from Delaware for land application	24,149	15,000	15,000
Tons of poultry litter-manure relocated to an alternative use project	56,681	55,000	55,000
% of cropland and nutrient-applied land managed under a current plan developed by a certified consultant	99	100	100
Acres managed under an updated nutrient management plan	96,701	100,000	100,000
# of nutrient consultants	107	100	100
# of commercial handlers	63	50	50
# of private applicators	1,137	1,500	1,500
# of nutrient generators	460	550	550
# of nutrient management farm audits	21	25	25
# of constituent complaints: received	46	50	50
resolved	43	50	50
# of CAFO permits	16	20	25

Nutrient Management Training, Education and Certification

The Commission continues to view education as a priority for many nutrient management topics and depends on the University of Delaware and agribusinesses to educate nutrient handlers. As farmers and other nutrient handlers become certified and continue the educational requirements, better nutrient handling decisions are made. The Commission has issued 2,693 certifications since the January 2004 deadline. Currently, 1,767 different nutrient management certifications are maintained by the program and can be individually viewed on the Program's website (http://dda.delaware.gov/nutrients/forms/2009/020409_Certified%20Users.pdf):

1. 460 Nutrient Generator certifications valid for three years;
2. 1,137 Private Nutrient Handler certifications valid for three years;
3. 63 Commercial Nutrient Handler certifications valid for one year;
4. 107 Nutrient Consultant certifications valid for one year.

Nutrient Management Certification classes continue to be offered throughout the year for both initial and continuing certification. The University of Delaware Cooperative Extension conducts most of these classes. In 2008, 21 different classes were offered for

initial certification along with six different testing opportunities. Ninety-five different programs were offered by public and private organizations resulting in 234.75 continuing education credits assigned and 2,033 attendees.

In order to become certified as a consultant or a commercial nutrient handler, one must pass an examination. Three examination

**Summary
Initial Certification Classes 2008**

Certification Session	# of Sessions	Attendance
Session I: General	5	111
Session II: Nutrient Generator	5	84
Session II: Horticulture	2	26
Session III: Private Nutrient Handler	5	82
Session IV: Commercial Nutrient Handler	2	15
Session IV: Nutrient Consultant	2	18
Commercial Nutrient Handler Exam	3	18
Nutrient Consultant Exam	3	15



In 2008, 95 different continuing education opportunities were provided with 2,033 attendees receiving credit, such as this class during Delaware Ag Week.

sessions for nutrient consultants and three examinations for commercial nutrient handlers were offered in 2008, resulting in 26 (79%) passing scores and 7 (21%) failing scores. Nutrient consultant test questions are pulled from a databank of questions shared by Delaware, Maryland, Virginia and Pennsylvania for reciprocal purposes. The test sessions are also coordinated with the national Certified Crop Advisor (CCA) program to expand the opportunities for crop consultants. The exam for commercial nutrient handlers was generated by University and Program Staff. All certifications, except Nutrient Consultants, are certified over a three-year period. Nearly one third of all certifications will expire May 1.

Continuing education opportunities can be integrated with any meeting or gathering of nutrient handlers. One continuing education credit is equivalent to approximately 50 minutes and is measured in 1/4 credit increments. Credits are approved by providing the

meeting or class agenda to the University of Delaware Carvel Research and Education Center or the State Nutrient Management Program prior to the event.

Summary **Approved Continuing Education Classes**

Year	# of Programs	# of Continuing Education Credits Available	Attendance
2004	8	46.32	285
2005	33	87.28	1458
2006	56	113.95	1930
2007	92	200.75	3028
2008	95	234.75	2033
Total	284	683.05	8734

Nutrient Management Planning

A nutrient management plan is a farmer's "business plan" for nutrients. The more efficiently fertilizers are used on the farm, the less nutrients escape to waterways. A plan is developed by a certified nutrient consultant and includes contents such as maps, soil analysis, manure analysis, crop yield goals and a budget for nutrients.

The Commission depends on private and public nutrient consultants to develop nutrient management plans. In 2008, 144 farms, 1 recreational riding facility, and 1 nursery representing 85,576 acres were reimbursed at a capped rate for a plan developed by a private consultant. New Castle, Kent and Sussex Conservation Districts assisted 66 farms representing 11,125 acres in the development of nutrient management plans. These acres represent an obligation for at least 3 years of nutrient management planning. Also, 72 farms were assisted with an animal waste management plan.

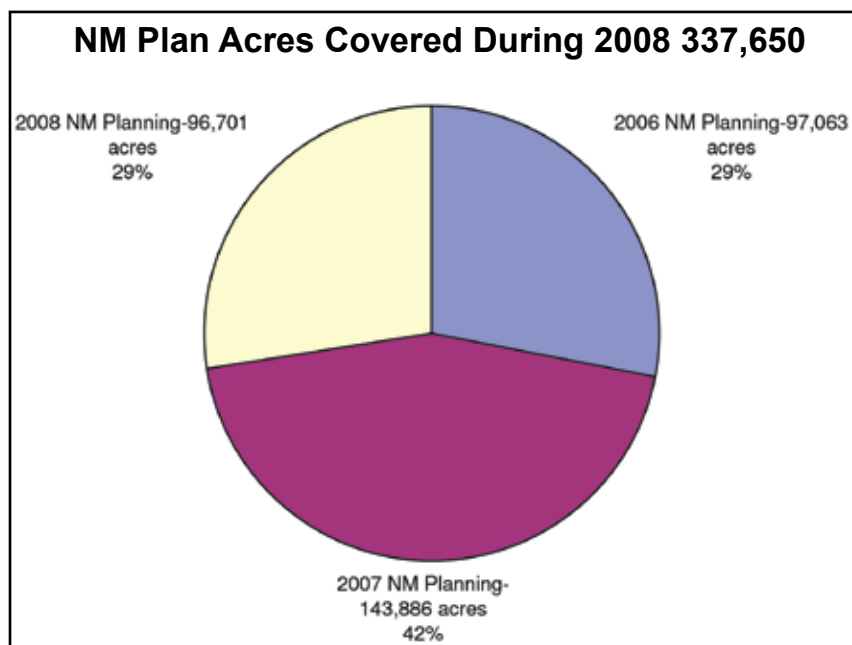
During 2008, Delaware farmers applied and were approved for a total of 85,576 acres of nutrient management planning. The total acreage covered by nutrient management planning reimbursement during 2008, including those farms that were approved during 2006 and 2007, was 297,211 acres. During this same period public nutrient management planning covered 40,439 acres. The combined total of both public and private nutrient management planning was 337,650 acres.

Mandate Phase-In Complete

The last phase-in date for developing and implementing Nutrient Management Plans was January 1, 2007. The Nutrient Management Law required the Commission to phase in the nutrient planning, reporting and implementation over a five-year period. These compliance deadlines started January 1, 2003 with incremental deadlines being every January 1st.

The Commission established a database of 6,775 property owners whose properties demonstrated characteristics that may require a

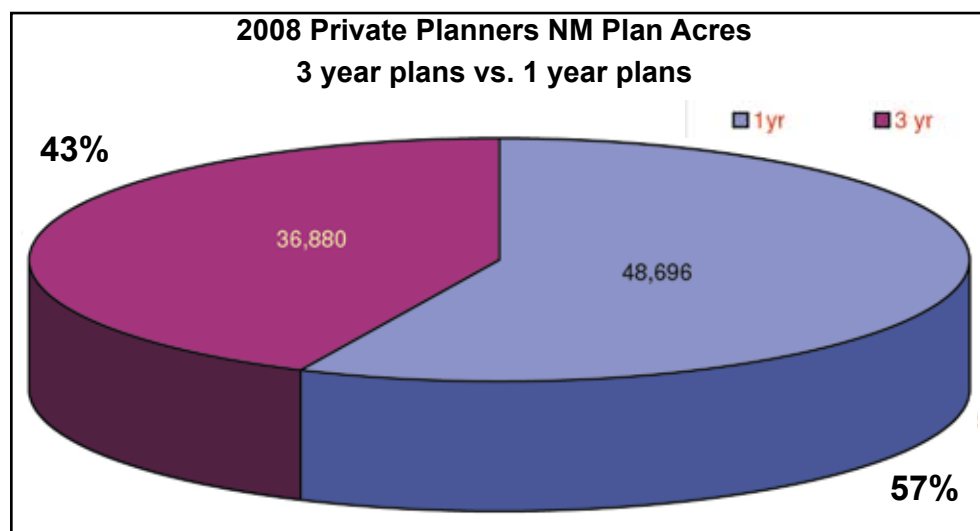
nutrient management plan. All property owners were notified of the mandate during the summer prior to each January. There were 1,158 property owners who responded as the person responsible for implementing nutrient management practices. 2,662 respondents indicated that they lease their property. The remaining property owners were not affected by the law for various reasons. The notification process resulted in 453,291 acres (100%) of crop land being notified of nutrient management requirements.



Nutrient Reports Due March 1, Annually

The Nutrient Management Law requires farmers and other nutrient handlers to submit an annual report by March 1 of every year summarizing the nutrients handled and applied within their operation. This reporting process is one of the most challenging aspects of the law because the program only receives about half of the reports expected. For 2008, the program received 445 reports, which will be entered into a watershed-based database for aggregating progress and accountability. The total reports received in 2007 were 410 and in 2006, 548 reports were received. The aggregated data, however incomplete, can be used to follow progress and trends such as the following:

- 65% generate and/or handle animal manure.
- 45% only grow crops and do not generate or handle animal manure.
- 31% apply animal manure to the land they manage.
- 77% apply commercial nitrogen at an average rate of 103 lbs. per acre.
- 56% apply commercial phosphorus as phosphate at an average rate of 23 lbs. per acre.



County Conservation Districts

The Commission works cooperatively with County Conservation Districts to promote and implement nutrient related Best Management Practices. Many practices that are coordinated by the Conservation Districts result in success that helps both the environment and the farmer. Kent and Sussex Conservation District offices staff a total of seven Conservation Planners who develop nutrient management plans. The following is a 2008 summary of the Districts' accomplishments:

NEW CASTLE COUNTY

Construction/Planting Contracts

- Manure storage – 4
- Cover crop – 3,470 acres
- Roof runoff structures – 6
- Stream fencing – 5,591 ft

In-House Accomplishments

- Conservation plan development – 10,411 acres

KENT COUNTY

Construction/Planting Contracts

- Manure storage – 6
- Mortality storage – 3
- Cover crop – 10,930 acres
- Concrete pads for manure handling – 71

In-House Accomplishments

- Nutrient Management Plan development – 29 plans representing 3,437 acres
- Animal Waste Plan development – 9
- Conservation plan development – 23,911 acres
- Pre-side dress soil nitrate test – 8,990
- Assisted with Derelict Poultry House Nutrient Recovery Project

SUSSEX COUNTY

Construction/Planting Contracts

- Manure storage – 3
- Mortality storage – 1
- Cover crop – 36,127 acres
- Concrete pads for manure handling – 41

In-House Accomplishments

- Nutrient Management Plan development – 32 plans representing 7,419 acres
- Animal Waste Plan development – 63
- Conservation plan development – 7,819 acres
- Pre-side dress soil nitrate test – 172 representing 6,713 acres



Nutrient Management Planning: Certified Nutrient Management Consultants are available to assist farmers with Nutrient Management Plans, Conservation Plans and more.

Planning and Implementation Costs

Funds for the implementation of nutrient management planning are provided by state and federal sources. During 2008, the Commission obligated \$413,815 for the reimbursement of costs associated with the development of nutrient management plans by private consultants. The Department of Natural Resources and Environmental Control (DNREC) provided \$420,000 of Clean Water Act, Section 319 funds to Kent and Sussex Conservation Districts for seven conservation and nutrient management planners. The University of Delaware Cooperative Extension also provides assistance to farmers in developing nutrient management plans. The total public cost for developing nutrient management plans for 2008 was approximately \$833,815, an average of \$1.84 per acre of Delaware cropland.

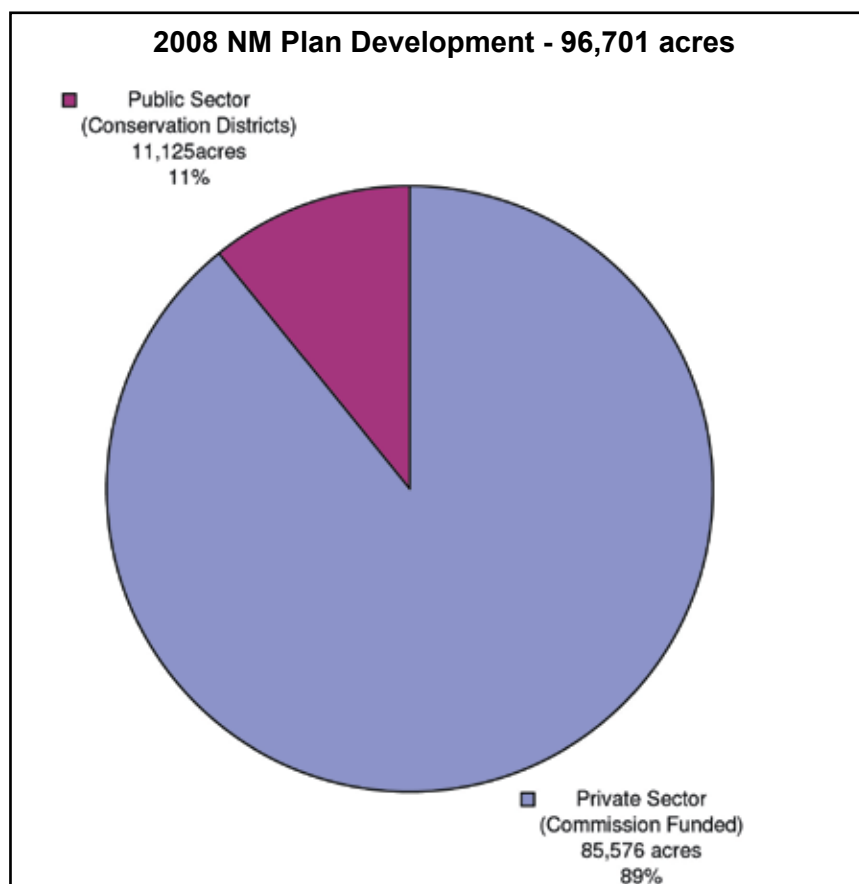
The implementation of nutrient management practices goes beyond the development of a plan and depends on an array of federal, state and local resources. Such implementation practices include the construction of manure storage structures and in-field conservation practices. Expenditures for such practices include:

1. \$3,526,584 in federal funds (Farm Bill) from Natural Resource Conservation Services (NRCS) for manure structures and best management practices such as manure and mortality management, heavy use protection, cover crops, windbreaks and other practices;
2. \$1,705,000 in state funds from DNREC for manure structures, mortality management, heavy use area protection, manure handling equipment, dairy waste systems, and cover crops;
3. \$1,047,441 in funds for poultry litter-manure relocation (see below for details). The funding source for the Relocation Program includes about 48% federal funds, 40% state funds and 12% funding from Allen's Hatchery and Mountaire Farms.

In summary, the public costs associated with developing and implementing nutrient management practices for 2008 was approximately \$7,112,840. Most projects are funded by both public and private funds. Property owners will match a certain percentage of the total cost; this match is estimated to be at least \$1,743,861. The total cost from property owners and the public is estimated to be approximately \$8.8 million in 2008.

Nutrient Management Compliance Audits

Each year the program staff audits a goal of at least 10% of those facilities required to have a nutrient management plan, records and certification. This process helps to ensure that plans meet the intent of the nutrient management law and regulations. During 2008, program staff audited nutrient management compliance on 21 different farms. Furthermore, four businesses that participated in relocation of nutrient management plan reimbursement were audited for recordkeeping and generally accepted business practices.



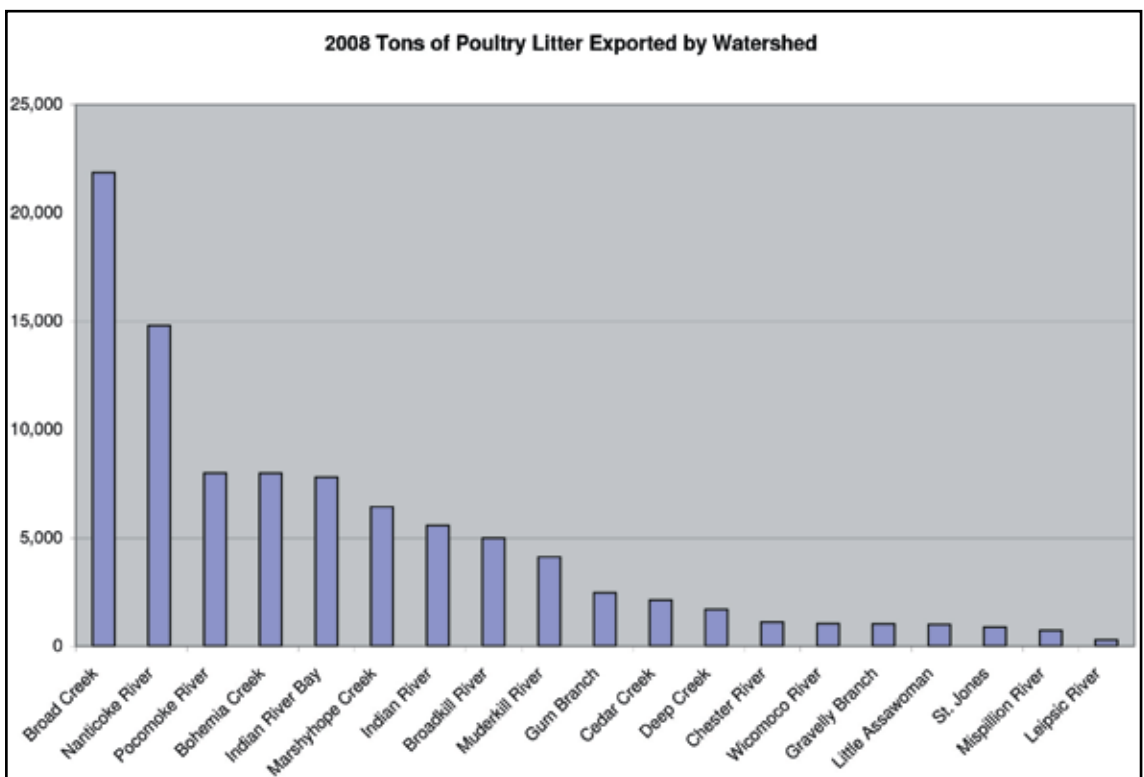
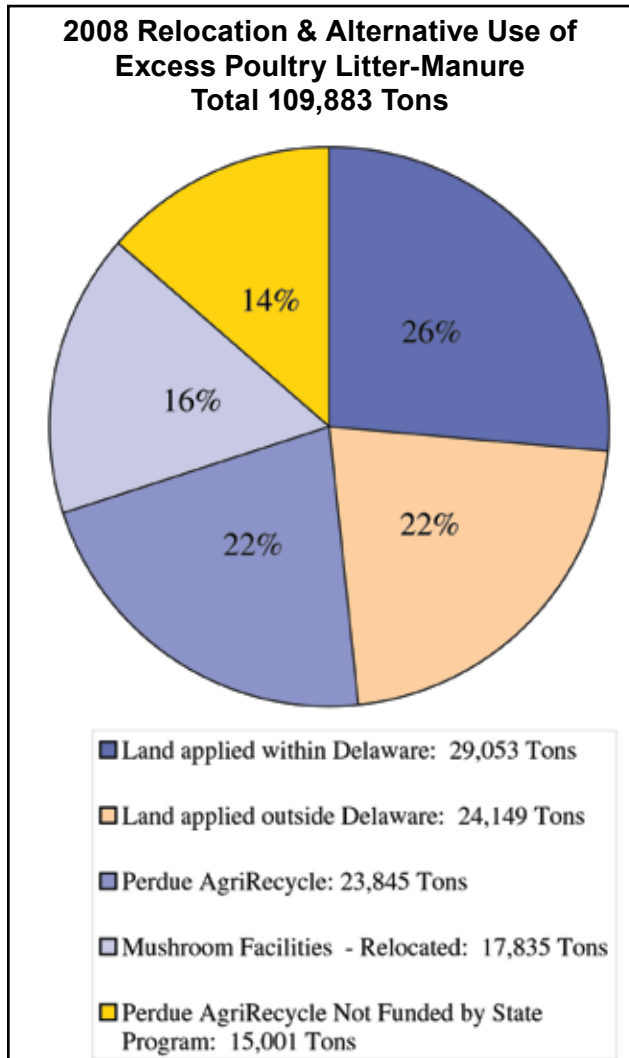
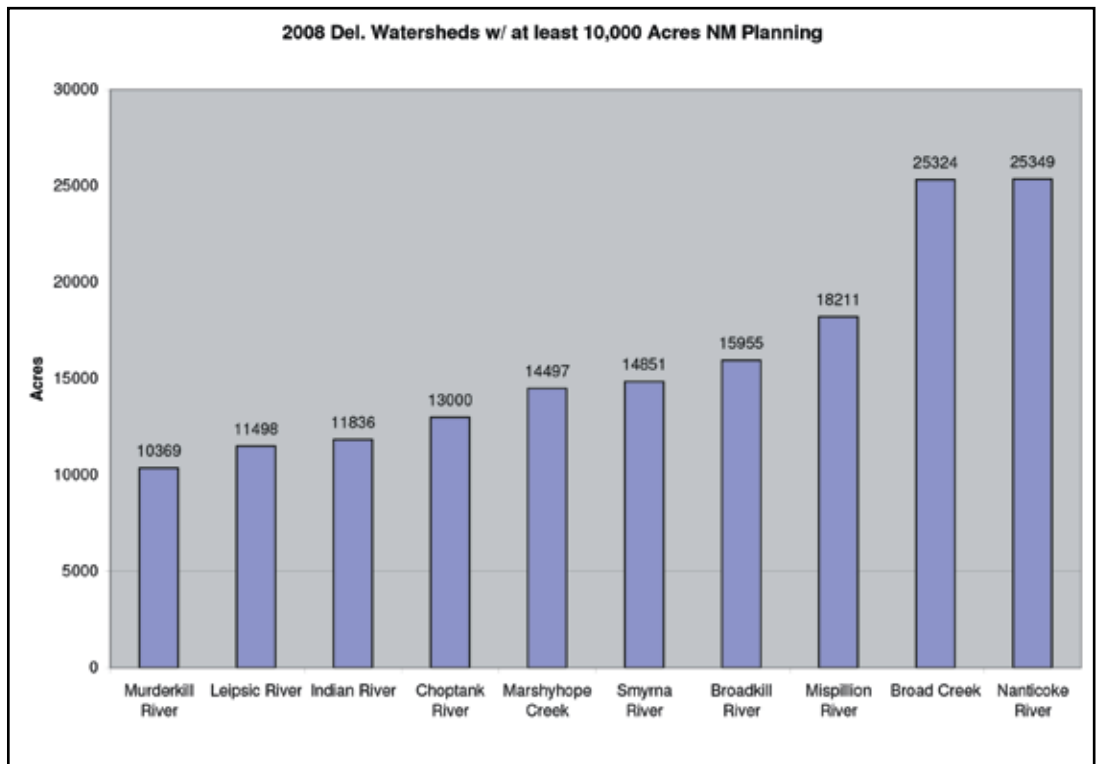
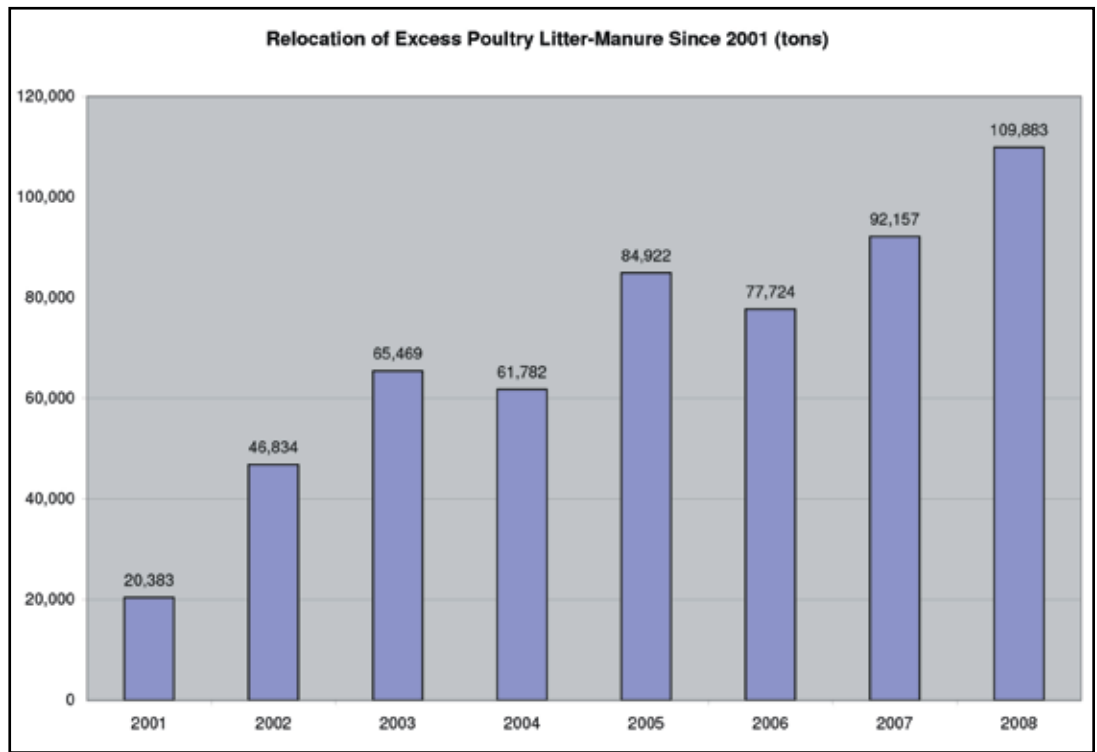
Nutrient Management Relocation

Managing excess poultry litter-manure has been a priority of the Commission since inception. Many farmers who demonstrate insufficient land or high soil phosphorus levels must find alternative uses for poultry litter-manure. Many businesses are available to help manage excess litter-manure. The Relocation Program is one of several effective solutions to excess litter-manure generated in Delaware.

The Relocation Program provides financial reimbursement to farmers, brokers and trucking businesses for the transportation cost of relocating litter-manure from Delaware farms to alternative use projects or other farms for land application. The application process validates eligible senders, receivers, truckers and alternative use projects. Excess litter-manure continues to be transported for land application throughout Delaware as well as Maryland and New Jersey. Alternative use projects include the Perdue AgriRecycle organic fertilizer plant and the mushroom businesses that use litter-manure for composting a growth medium for mushroom production.

In 2008, 109,883 tons of excess poultry litter-manure were relocated, an eight-year total of nearly 560,000 tons. Over 50% of the excess litter-manure went to alternative use projects. The Perdue AgriRecycle plant processed a total of 60,400 tons in 2008, 30,575 tons being Delaware-generated.

Farmers and others wishing to participate in relocation projects can register with the nutrient management matching service by contacting (302) 698-4500. The Relocation Program provides farmers with the option to move the litter-manure themselves or hire a broker.



Markets for Excess Manure

The following businesses have expressed interest in taking or buying excess manure for alternative use and/or brokerage. Please contact them directly:

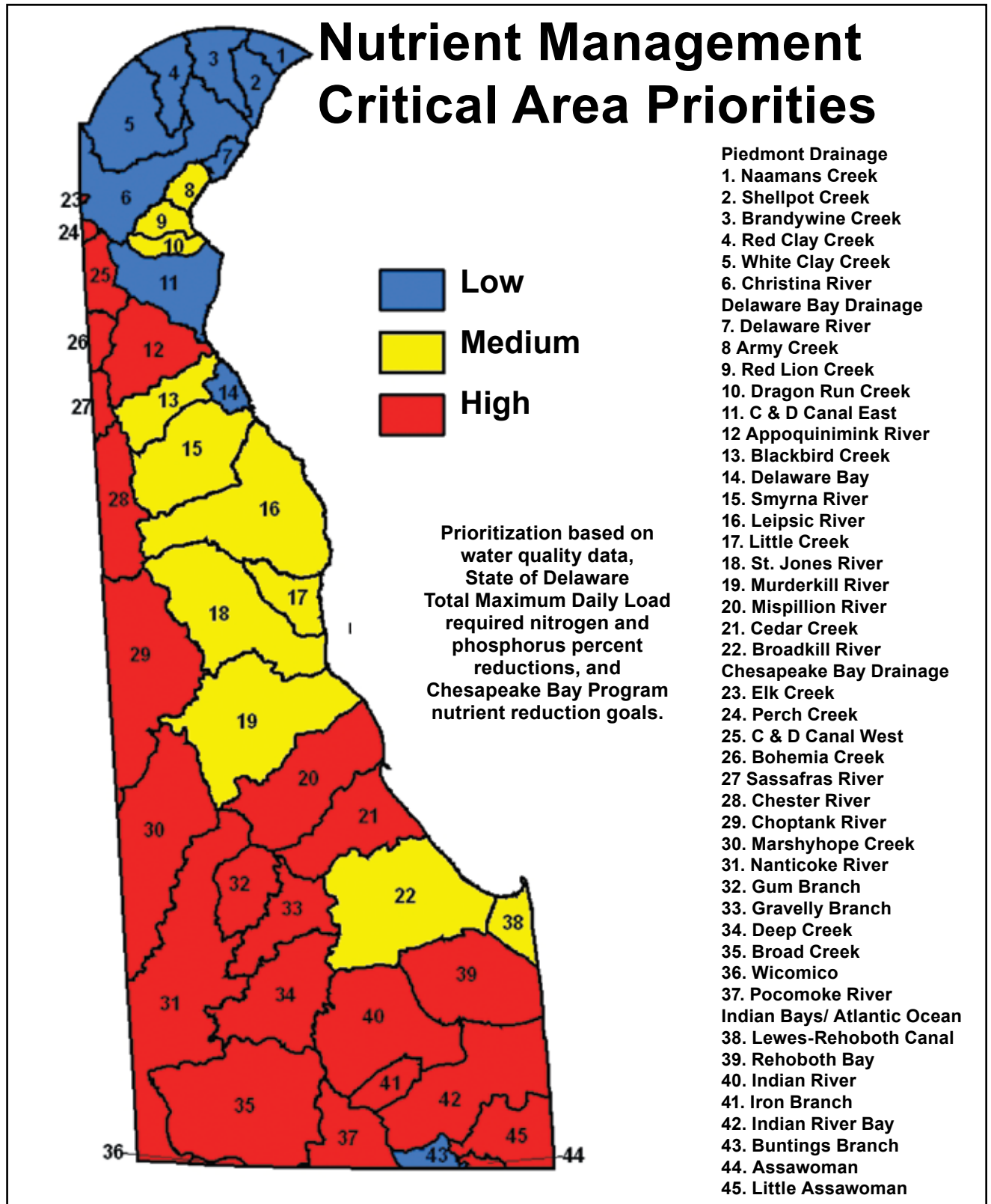
Manure Type	Name	Area	Contact
Horse (shavings)	Blessing Composting	Milford DE	302 684-8990
Poultry	Bowles Enterprises LLC	Loveville MD	301 475-2139
Poultry	Ellis Farms Inc	Millsboro DE	302 238-7275
Poultry	Perdue AgriRecycle LLC	Seaford DE	302 628-2360

At right, the Perdue AgriRecycle fertilizer plant in Blades, DE processed a total of 60,400 tons of litter-manure in 2008, 30,575 tons of it generated in Delaware.



Nutrient Management Critical Areas

The Commission established a “critical areas” map for Nutrient Management. The Department of Natural Resources and Environmental Control (DNREC) provided significant input based on water quality data for Nitrogen and Phosphorus impairments.



Delaware Environmental Stewardship Program

The Commission partnered with three poultry companies and Delaware Maryland Agri-Business to recognize the 2008 environmental stewards. Allen's Family Food Inc., Mountaire Farms Inc., Perdue Farms, Inc., and Delaware Maryland Agri-Business funded the stewardship program.

The environmental stewardship award was established in 2001 to recognize farmers whose stewardship and general farm practices contribute to the conservation of the environment, water quality and farmland. The program recognized growers by evaluating nutrient management, best management practices, farm management,

innovation, biodiversity and wildlife management.

The 2008 Delaware Environmental Stewardship Awards were presented during the Delaware Agriculture Week conference held at the Delaware State Fairgrounds in Harrington. Joe and Diane Bauer from Harrington was awarded the top award with \$1,000, a lane sign and a plaque. Three other 2008 environmental stewards were awarded with \$500, a lane sign and plaque. They are:

- Bruce and Pam Daisey from Millsboro
- Craig Truitt from Seaford
- Chet and Sally Dickerson from Dover



Mike Levensgood, Perdue Farms, Inc.; Diane Bauer; Joe Bauer; Dianne Vrem; Stacey Vrem; and Jeff Smith, Perdue Farms, Inc.



Bill Massey, Mountaire Farms of Delaware; Craig Truitt; Bill Rohrer, Nutrient Management Program Administrator



Mike Twining, Willard Agri Service; Billy Willard; Bob Willard; Chet Dickerson and Sally Dickerson.



Tom Miller, Allen Family Foods, Inc.; Pam Daisey; Bruce Daisey; and Tom Brinson, Allen Family Foods, Inc.

Permits for Certain Animal Feeding Operations

The Nutrient Management Program continues to administer national pollution permit regulations for Delaware's animal feeding operations. The 1972 Clean Water Act and revised Federal regulations require permits for some farms called Concentrated Animal Feeding Operations (CAFO).

Program Structure

The Environmental Protection Agency (EPA) maintains oversight authority of the Delaware CAFO program as the responsible agency of the Clean Water Act. The DNREC was delegated authority in 1974 to administer the National Pollutant Discharge Elimination System (NPDES) permits for surface water discharges. These

permits are designed to limit discharges from CAFOs, combined sewage overflows, storm water construction projects, industrial activities and municipal treatment activities.

The Delaware Department of Agriculture (DDA) and DNREC implemented the Delaware CAFO program under a formal agreement signed by the respective Cabinet Secretaries in June 2000. The Nutrient Management Commission (DNMC) oversees the implementation of the State Nutrient Management Law and the administrative staff. CAFO regulations were adopted by DNREC and DDA, and became effective September 10, 2005. The responsibility for the enforcement of CAFO regulations is primarily handled by Nutrient Management Program staff.

Current CAFO Permits

Delaware CAFO permits are initiated by farms that desire the highest level of accountability or which experience a discharge into the waters of the state. The CAFO requirements are activated when the person in charge of a farm signs and submits a Notice of Intent (NOI) to comply with the regulations. A copy of the nutrient management plan must accompany the NOI.



Farm ponds, such as the above, are not considered state or U.S. waters, and often eliminate the need for CAFO permits since storm water is contained within the farm operation.

In conflict with state interpretation, EPA recently deemed a discharge is present when certain farms operate near conveyance systems such as drainage ditches. This recent interpretation resulted in over 300 NOIs submitted as of mid March 2009. During 2008 the following 16 animal feeding operations were managed under a CAFO permit:

CAFO NAME	ANIMAL TYPE	CAPACITY	LOCATION
A and J Farm	Broiler Chickens	168,000	Hartly
Allah Akbar Farm	Broiler Chickens	191,000	Felton
Crissman Racing Team	Race Horses	40	Wyoming
Delaware Park	Race Horses	1,500	Wilmington
Hickory Manor Farm	Broiler Chickens	78,000	Frankford
Kaufmann Chicken Ranch	Broiler Chickens	80,000	Seaford
McDowell Farm	Broiler Chickens	97,000	Greenwood
Messick Farm	Broiler Chickens	81,600	Bridgeville
Puglisi Egg Farm of Delaware LLC	Laying Hens	955,000	Middletown
Raghunandan Farm	Broiler Chickens	217,000	Millsboro
Ralph Farm	Broiler Chickens	86,000	Delmar
Rick Chick Farm	Broiler Chickens	650,000	Frankford
Schiff Farms Inc.	Feeder Cattle	4,000	Whiteleysburg
Slabaugh Farm	Broiler Chickens	89,000	Delmar
Szewczyk Farm	Broiler Chickens	43,000	Delmar
W and C Farm	Broiler Chickens	177,000	Delmar

Any farm that operates under a CAFO permit is subject to an inspection by program staff. The permit requires a nutrient management plan, records of implementation, annual report, certification and other site specific practices.

EPA Inspections & Farm Visits

EPA conducted four poultry farm inspections during 2008, a total of fifteen since March 2007. The inspections were conducted under the authority of the federal CAFO regulations on farms that were identified as having suspected poultry litter-manure exposed to runoff within the production area and having a risk for a discharge. During the summer of 2008, EPA and state officials conducted 20 different farm assessments to examine conditions and differences in determining a discharge. The assessments established a stark difference between State and EPA officials. EPA concluded that 14 of the 20 farms (75%) needed a CAFO permit while the state concluded that 2 of the 20 (10%) may need a permit.



EPA conducted four enforcement inspections in 2008, a total of 15 since March 2007 similar to the above illustration of inspectors pulling water samples from a tax-ditch near a poultry farm.

Recent EPA CAFO regulations established a February 27, 2009 deadline. The deadline pertains to the need for permit coverage if a discharge exists, or will exist in a rain event up to approximately six inches. The current Delaware CAFO permit program provides the necessary permit coverage mandated by EPA regulations.

State officials, which included DDA and DNREC Cabinet Secretaries, met with the EPA on many issues in dealing with the EPA inspections and recent regulations.

A committee made up of DNREC, DDA, Commission members and NRCS continue to meet with EPA to discuss inspections and the current structure of the Delaware CAFO program.

Storm Water Management

Over the past year, many farms experienced EPA and state inspections where the runoff of storm water was the primary issue of concern. The Commission asked DNREC to evaluate storm water management for typical poultry operations and provide recommendations in the form of BMPs. The following BMPs were provided and adopted by the Commission for consideration:

1. Further promote the use of existing BMPs, policies and procedures: Growers need to follow existing Commission policy and NRCS standards. This includes the use of the appropriate BMPs for each individual production area. Critical BMPs that will assist in preventing runoff from polluting nearby waters include:
 - Timely cleanouts to avoid rain events during litter/manure handling;
 - Handle litter-manure under roof when practical;
 - Prevent overfilling loaders and crusting machines that may result in spillage;
 - Minimize exposed litter-manure in the production area;
 - Clean up any spilled manure as soon as practical.
2. Adopt “good housekeeping” as a BMP. Proper procedures during clean-out and crust-out can prevent manure from entering the environment and is essential. Many of the proposed BMPs include maintenance of grass both between poultry houses, manure sheds, and any ditches or waterways.

Vigorous, well maintained grass areas between water courses and poultry houses, manure sheds and composters will provide healthy vegetation that will facilitate filtering of nutrients and trapping sediments.

3. New farm construction recommendations for poultry houses, manure sheds and composters. For those houses and manure



A vegetative buffer filters runoff before it reaches the drainage ditches at the tree line in the photograph above.



Good housekeeping of litter-manure within the production continues to be the most important BMP for protecting water runoff from becoming dirty.



The above wetland system is an excellent BMP for natural filtration of nutrients that may runoff with agricultural storm water.



Any poultry litter-manure stored within the production area of a farm must be under roof or protected from runoff, such as the above examples.



sheds that have yet to be built, we stress the importance of working with the integrator, NRCS and the conservation districts to ensure the structures are properly sited. This would include the consideration of

- Soils
 - Wetlands
 - Floodplains
 - Tax ditch rights-of-way
 - Utility easement
 - Property lines
 - Waterbodies, including ditches
4. Promote the construction of new buildings within the production area in a manner consistent with the State Sediment and Stormwater Law and policies. They include practices such as silt fences, stabilized construction entrance, sediment traps

on some sites and vegetative stabilization. BMPs used during construction would be in accordance with the conservation plan for the farm and may include county building code setbacks such as the following:

- 100 feet from a stream or ditch system
 - 50 feet from tidal wetlands
 - 25 feet from non-tidal wetlands
 - 1 foot above floodplain
5. Explore additional outreach to include the University and certification curriculum. Furthermore, flock supervisors should be educated on many of the BMPs.
6. Drainage pipes within the production areas of a poultry farm should not be removed, but rather serve as a mindful reminder that stormwater leaves the farm and good housekeeping will reduce the nutrients from being a part of the runoff.

Continued Agreement with Poultry Companies

The Nutrient Management Commission continues to implement the nutrient management agreement outlined in the 2001 and 2007 agreements with all three poultry companies. These documents were signed by the chief executives of all poultry companies operating in Delaware and state officials. The document expands on the legal requirements to submit an annual report to the Commission outlining the accomplishments and strategy for nutrient management. Furthermore, it outlines a general strategy for finding a home for excess poultry litter-manure. All poultry companies agreed to either establish an alternative use project or assist in funding the Nutrient Relocation Program. The annual reports are submitted by Allen's Hatchery Inc., Mountaire Farms of Delmarva, Mountaire Farms of Delaware, and Perdue Farms Inc.

This cooperative agreement and implementation plan has generated results that benefit the state, the poultry industry, contract growers, and the general public. All companies have modified their grower contract to address the nutrient management requirements, committed to apply the phytase enzyme in all feed, educate growers and company employees by means of nutrient management certification, fund the environmental stewardship recognition program, distribute nutrient management newsletters and more. Additional company accomplishments follow:

Allen's Corporate Environmental Manager, M. Thomas Brinson, reported the following:



1. Approximately 12,000 tons of excess poultry litter-manure were exported from company owned farms;
2. Recorded a 30.1% reduction in phosphorus in the feed as a result of phytase;
3. Continues to host multiple flock supervisor and grow-out meetings to address manure management and water quality;
4. 100% of in-house flock supervisors who service Delaware growers completed state nutrient management certification;
5. Enrolled 814 acres of company owned property into water improvement conservation programs.
6. Assisted in funding the Relocation Program for contracted growers valued at \$66,481.61.

Mountaire's Corporate Environmental Manager, Beth Sise, reported the following:



1. New farm evaluation process for nutrient management;
2. Existing farm evaluation resulting in bird placement after validation that nutrient management planning and certification are in place;
3. Recorded a 1,050 ton reduction of total phosphorus from phytase use in three Mountaire feed mills;
4. Grower lunches to expand and continue nutrient management education;
5. Continuation of nutrient management certification for all servicemen;
6. Assisted in funding and participated in five water quality and

air quality research projects.

7. Assisted in funding the Relocation Program for contracted growers valued at \$76,192.85.



Perdue's Regional Environmental Manager, Jeff Smith, reported the following:

1. Continued nutrient management training of all corporate environmental service and flock service employees;
2. Partnered with the Center for Inland Bays to implement the Poultry Integrator Nutrient Effort (PINE) project;
3. Perdue AgriRecycle pellet fertilizer plant that serves as an essential alternative for growers from all three poultry companies;
4. Recorded a 104.7 ton reduction in inorganic phosphorus addition to feed resulting from phytase use;
5. Continue the Clean Bays Environmental Management Initiative, which entails on-farm assessments for manure management.
6. Funded and participated in nutrient management related research projects valued at \$510,000.

Nutrient Management for Horse Farms

The equine industry is one of the fastest growing sectors of Delaware agriculture. The state is home to many commercial and hobby stables as well as several large racing training facilities and three public race tracks.

Facilities that house horses with a cumulative weight of 8,000 lbs. (about 7 horses) or those that apply nutrients to greater than 10 acres need a Nutrient Management Plan. This plan allows the operator to



The above horse stable is designed to redirect all roof runoff; a common way to protect clean water from contacting areas that may cause sediment or nutrient runoff.

better manage the handling of manure and used bedding. Such manure or used bedding should be stored under cover or in a manner to prevent runoff. Horse facilities also need to handle waste from animal wash down areas in such a way that it doesn't discharge into nearby ditches or other waters.



Complaint Resolution

Complaints related to manure management and general nutrient management practices are handled and resolved by program staff. Actions against any alleged violation of the Nutrient Management Law, regulations or standards are investigated by program staff and recommended for action by the Commission.

During 2008 the Nutrient Management Program investigated and the Commission acted on three violations of the Nutrient Management Law. Two of the violations involved the applications of nutrients from manure during the winter months and one violation involved improper storage of poultry litter-manure.

Forty-six public complaints were received and resolved by program staff relating to manure management, livestock management, odor and nutrient management certification. The categories of complaints and operation types are as follows:

Complaint Category	
Manure management	63%
Odor	20%
Mortality Management	15%
Fertilizer Management	2%
Operation Type	
Poultry	50%
Field Crop Only	33%
Horse	7%
Swine	7%
Dairy	2%
Lawn Care	1%

Nutrient Management Mass Balancing

A NUTRIENT BALANCE INDEX FOR THE STATE OF DELAWARE

Nutrient mass balances are used worldwide to guide strategic nutrient management planning efforts for farms, watersheds, states, regions, and countries. In brief, a mass balance analysis compares nutrient inputs (fertilizers, manures, etc.) to a defined geographic area with nutrient outputs (crop harvest, manure relocation, etc.). Nutrient surpluses (inputs > outputs) indicate an increased potential for nutrient losses to air and water or nutrient accumulations in soils above values needed for optimum crop yields. In contrast, nutrient deficits (outputs > inputs) suggest the amount of nutrients needed for economically optimum crop production may not be available and that soil nutrient levels will gradually be depleted.

In cooperation with the Delaware Nutrient Management Commission, we have developed a simple method to estimate agricultural nutrient mass balance analyses for Delaware each year for nitrogen (N) and phosphorus (P). Our goal has been to document how efforts to improve agricultural nutrient

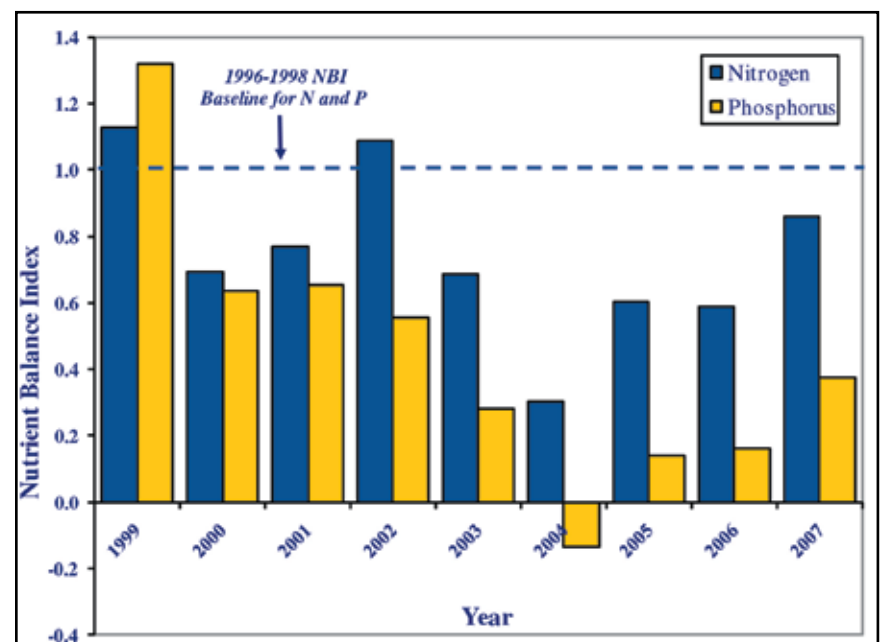
management, particularly since passage of the 1999 Delaware Nutrient Management Act, have affected statewide and county-level nutrient mass balances. Detailed summaries of the trends in nutrient mass balances are summarized each year in an annual report presented to the DNMC.

A Nutrient Balance Index (NBI) for Delaware: While detailed nutrient mass balance analyses are very useful in efforts to develop science-based agri-environmental policies, there is also a need for a simple means to illustrate how nutrient balances are changing each year in Delaware. To do this, we have developed a Nutrient Balance Index (NBI) that can quickly and clearly show the impact of changing nutrient management practices and other factors (e.g., climate) on annual statewide N and P surpluses.

Our Delaware NBI approach first calculates the average per acre N and P surpluses in 1996-1998 (the 3 years immediately prior to the 1999 Delaware Nutrient Management Act) as the difference between [fertilizer and manure N and P produced or sold] and [N and P removed in crop uptake and exported from Delaware via manure relocation]. These 1996-1998 NBI values are set as the baseline, pre-existing conditions (NBI = 1.0). Beginning in 1999, an annual NBI is then calculated in the same manner and expressed as the ratio of the statewide per acre N and P surpluses in each year to the 1996-1998 baseline values. Lower NBI values indicate smaller N and P surpluses and are a measure of statewide progress in nutrient management.

Phosphorus: As shown in the figure below, trends in the Delaware NBI for P show that significant progress has been made in reducing P surpluses in Delaware since the passage of the Nutrient Management Act of 1999. For 2005-2007, the NBI averaged 0.22, indicating an approximate 78% improvement (reduction) in P surpluses compared to 1996-1998. Primary causes for the reductions in P surpluses have been modifications in poultry diets to reduce the amount of P in manures and significant reductions in fertilizer P use as a result of statewide nutrient management planning efforts.

Nitrogen: The situation for N is more complex because N surpluses are heavily influenced by annual weather conditions. While the general trend observed is for more efficient N use in Delaware (lower NBI values and N surpluses today than in 1996-1998), improvements in nutrient management planning and practices for N can be offset by severe droughts. Consider the Delaware NBI values for N in two recent dry years 2002 (NBI=1.1) and 2007 (NBI=0.9) compared to 2004, a year with plentiful rainfall (NBI=0.3). Droughts reduce yields and crop N uptake which can result in large amounts of residual fertilizer and manure N remaining in the soil at the end of the growing season. Statewide efforts to



Trends in a Nutrient Balance Index (NBI) for Delaware from 1999 to 2007. Lower NBI values indicate that nutrient surpluses are decreasing and are a measure of statewide progress in nutrient management planning. Note the negative impact of drought years (2002 and 2007) on crop nutrient removal which contributes to the nutrient surpluses and high NBI values observed.

increase the amount of irrigated crop land and develop drought-resistant crops are needed to prevent situations where farmers apply the correct amount of N but, due to drought-induced crop failures, the N is not taken up by crops and becomes susceptible to loss by leaching during subsequent winter months.

Project investigators: Dr. Tom Sims, University of Delaware, Dr. Josh McGrath, University of Maryland, and Dr. Amy Shober, University of Florida. Prepared March 12, 2009. For more detailed information on this technical report, contact Dr. Sims (jtsims@udel.edu).

Phosphorus Management and Phytase

Managing phosphorus nutrient is required in the Nutrient Management Law by restricting phosphorus applications to the crop removal rate. Phosphorus limited manure applications can be managed and applied at a three-year crop removal rate. Excess poultry litter-manure is managed by alternative use projects such as the Perdue AgriRecycle plant, and the Relocation Program. Phosphorus is also managed in the feed formulations of the poultry companies. Phytase is significantly helping the industry better manage phosphorus in the feed and litter-manure.

Phytase is an enzyme currently added to poultry feed at the mill that helps broilers and other poultry utilize more indigestible (phytic acid) phosphorus. This, in turn, reduces the need to add supplemental phosphorus to the feed, and also reduces the phosphorus concentration in the litter-manure. Reports indicate that phytase has decreased phosphorus content in litter-manure by at least 23% (Saylor, 2005). Recent poultry litter-manure analysis has identified an average of 44 lbs. phosphorus (P₂O₅) per ton (Hansen, 2005). Analysis prior to 2001 was commonly seen at 60-70 lbs. P₂O₅ per ton. This 30-40% phosphorus reduction is the result of phytase, litter-manure amendments and the overall litter-manure handling practices implemented. The average nutrient content of poultry litter-manure is 57-44-45 pounds of N-P-K per ton. The use of phytase is one of several strategies needed to meet the intent of the Delaware Nutrient Management Law.

Delaware's Excess Poultry Litter

The assessment of excess poultry litter-manure in Delaware is essential in strategically solving the nutrient management imbalance for Delaware farms (Sims, 2008). Determining what is excess and measuring the distribution of excess poultry litter-manure may be the most important aspect in implementing the Nutrient Management Law. The following assessment is a summary and concluded that a Phosphorus crop removal restriction (required by Law) would result in 118,257 tons of excess poultry litter in Delaware. Approximately 305,625 tons of poultry litter-manure were generated with 109,883 tons relocated to alternative use projects, resulting in a difference of approximately 8,374 tons of poultry litter-manure still excess.

Poultry Litter-Manure Generation

Delaware growers produced a record 244.5 million broilers/roaster chickens in 2006 (DAS, 2007). An industry adopted litter-manure generation calculation is to multiply 1.25 tons per 1,000 birds (Coulal, 2005). This calculation accounts for the size variation of poultry, namely broilers and roasters, and the bedding material typically consisting of wood shavings. Poultry litter-manure generation is estimated at 305,625 tons annually.

Nutrient Value

The current nutrient value of poultry litter is 57-44-45 pounds per ton of total nitrogen (TN), phosphate (P₂O₅) and potash (K₂O) (Sims, 2007). Pounds per ton are illustrated as (TN-P₂O₅-K₂O).

Nitrogen and Phosphorus Mass Balancing

The fundamental tenet of economically and environmentally sound nutrient management is the strategic approach of nutrient mass balancing (Sims, 2008). The concept is simple but difficult and expensive to implement. Nutrient inputs to a farm, watershed, county or state should be balanced by nutrient outputs from the area of interest. Preventing a nutrient surplus should prevent the scenario where manure-nutrients are treated as a waste and not a nutrient. Furthermore, preventing a nutrient deficit is important for the economic value of nitrogen and phosphate. Nitrogen and phosphorus fertilizers are significant costs in grain production and should be equally valued when in the form of litter-manure.

During 2008, 109,883 tons of excess poultry litter supplied several alternative use markets for Delaware generated litter-manure. Most of the excess poultry litter-manure originated from Sussex County. The primary market drivers for excess poultry litter-manure are: 1. Phosphorus-limited nutrient management requirement; 2. Relocation funds to assist in the transportation cost of moving excess poultry litter-manure to crop farms low in soil-phosphate or alternative use projects; 3. Perdue AgriRecycle demand for litter-manure as a processed organic fertilizer; and 4. Mushroom industry demand for a nitrogen compost source.

The 2006 mass balance data was examined to assess poultry litter as an element of the surplus nitrogen and phosphate, namely phosphorus. The report indicates that New Castle and Kent Counties were nearly balanced as recommended for economically optimum crop yields (Sims, 2008). For Sussex County, the 2005 nitrogen and phosphate surpluses were pervasive; with nearly two times the amount of nitrogen and ten times the phosphate needed for crop production (Sims, 2008).

The mass balance report challenge is that nitrogen and phosphorus surplus amounts were the result of farm-gate inputs and outputs and did not segregate the source of nutrients. For example, over 8,000 tons of surplus nitrogen applied in 2005 in Sussex County comprised of commercial fertilizer and poultry litter-manure (Sims 2008). This surplus represents nearly half of the nitrogen inputs but does not indicate if the nutrient source over-applied is commercial fertilizer or poultry litter-manure. The phosphorus surplus in Sussex County represents 91% of the phosphorus inputs. The source of surplus nitrogen and phosphorus was not determined and to assume that all surplus nutrients are from poultry litter-manure or commercial fertilizer alone would be unfair.

The assessment of excess poultry litter-manure was conducted using three different methods; however, only the preferred method follows:

Phosphorus crop removal balance as required by the Nutrient Management Law: The Nutrient Management Law limits the application of phosphorus, primarily as animal manure, to a crop uptake level. As long as the expected crop has the capability to take up the phosphorus, it can be applied. This zero balance calculation prevents the over-application of phosphorus and permits application regardless of the phosphorus available in the soil from historical over-applications. The phosphorus input in the form of poultry litter is 66% and applies to excess poultry litter-manure proportionately. The 2006 total phosphorus excess of 590 tons calculates to be 389.4 tons (66%) of phosphorus as poultry litter-manure, or 40,533 actual tons of poultry litter-manure. This surplus along with the 2006 relocation projects result in a total gross surplus tonnage of 118,257.

The data suggests that 118,257 gross tons of poultry litter-manure were excess in 2006; that 109,883 average tons were supplied to alternative markets in 2008; and that 8,374 net tons are still excess.

Source: Rohrer, W.R. (2008). An Assessment of Public Policy: The Delaware Nutrient Management Law. Wilmington University, New Castle DE.

Best Management Practices

The Delaware Nutrient Management Program has published three Best Management Practices (BMPs) booklets, available free of charge to anyone requesting them. These BMPs are endorsed by the Commission and are designed to reduce nutrient runoff. These

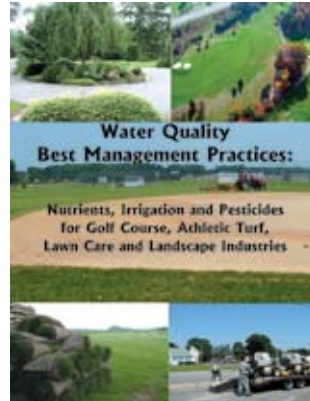
Agriculture Animal and Row Crop

The Commission recommends BMPs for farmers and the agricultural community. Fifty-six practices are included, covering items such as Feed Related Amendments; Manure Storage; Animal Mortality Handling; Analysis and Testing; Tilled Soil Management; Conservation Buffers; Drainage Ditch Management; Irrigation Systems and more.



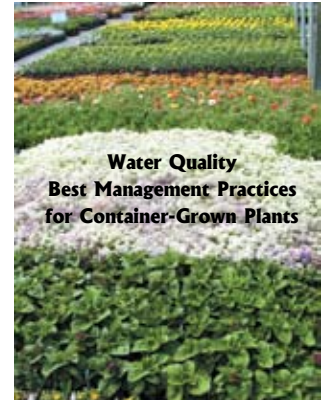
Golf Courses, Athletic Turf, Lawn Care and Landscape Industries

The Commission recommends BMPs for non-agricultural businesses such as golf courses and lawn care companies. The BMP booklet consists of 6 chapters which include: Introduction; Nutrient Management Certification; Nutrient Management BMPs; Fertilizer; Irrigation & Fertigation Management; and Pesticide Handling. This booklet is an invaluable resource which outlines who must be certified, how to become certified, and how to follow Best Management Practices in daily non-agricultural applications.



Container and Nursery Industries

The Commission recommends this BMP booklet for the greenhouse and nursery industries. The booklet contains 4 chapters which include: Nutrient Management Certification; Nursery Site Selection for optimum BMP usage, Irrigation and Water Conservation Strategies; Collection Basins; Stormwater Management; Fertilizer Application; Pesticide Application and more.



Recent Research on Temporary Field Storage

Officials receive report detailing litter stockpiling concerns

By Stephanie Jordan

Reprinted from *The Delmarva Farmer*

At the end of 2008, a report was delivered to the Delaware Nutrient Management Commission (DNMC) and the Natural Resources Conservation Service, detailing the work of those who examined what Best Management Practices should be used if a farmer temporarily stockpiles poultry litter.

The effort to gather information on this topic began in 2004, when the DNMC identified temporary storage of litter as one of the largest issues facing Delaware's agricultural industry.

Commission members also decided that the information used to evaluate temporary litter storage should be drawn from research that examined nutrient loss from production-sized piles.

Prior to this meeting, researchers at the University of Delaware had realized that majority of research and demonstrations has been done on research-size piles (eight to 10 tons of litter) rather than production-sized piles. Therefore, researchers set out to provide information on the nutrients (the kind of nutrient and the amount) lost from a production-sized pile.

The principal investigator of the study was Greg Binford, who is an associate professor at the University Delaware, and the co-investigator was Bud Malone, a poultry Extension specialist, also with the University of Delaware.

Researchers had three objectives for this study: To evaluate the length of time of litter storage; to evaluate what type of cover, if any, should be used; and to evaluate what treatment should be applied under the litter pile.

Some results from the study were surprising, Binford said.

"After following several of these piles during the first two years of this project, I was quite surprised in the third year when the footprint of the three piles in the same field could not be located once the corn crop was established," he said. "Visual evaluations of the corn crop showed no visual signs that a poultry litter pile had been placed in the field at any of the three locations."

"I attribute this to the tillage operations that the growers used after removing the pile and before planting the crop, because these three piles had just as much nutrient in the soil after the pile was removed as any other pile we'd monitored in previous years."

The litter for all projects came from total cleanouts of local poultry houses. Two methods were used to measure nutrient losses — runoff pans collected runoff/leachate from the edges of litter piles and soil samples were taken from either the surface 36- or 48-inch soil layer.

Potassium was found to be the nutrient lost in the greatest amounts (eight times greater than nitrogen losses), with sulfur following as the No. 2 nutrient lost (the amounts of sulfur lost were double the amounts of nitrogen lost).

Binford said it was surprising to him that the main nutrient coming out of the piles was potassium, but "in hindsight it makes sense (because)

booklets are valuable training tools for nutrient handlers and are often found as a component of the nutrient management plan. See page 16 for information about how to contact the Nutrient Management Program to obtain a copy of these informative booklets.

most all the potassium in these piles is soluble."

He added that he had expected to see more nitrogen being lost from the piles, but most of the nitrogen is organic and is not soluble, which he said explains the low levels lost.

High concentrations of potassium and sulfur contributed to high levels of soluble salts; at those levels, soluble salts either prevent seed from germinating or destroy the roots of young plants, killing the plants.

Phosphorus losses from litter piles were small, a result Binford said was not surprising based on previous research by others in the field.

Data also was collected from a variety of cover treatments.

The Environmental Protection Agency recommends that litter stockpiles remaining in the field for more than 14 days should be covered with polyethylene.

But according to background information from the report, farmers have had difficulty covering the piles with polyethylene because of the constant upkeep and monitoring required, and the cost of maintenance.

The study found that no-cover treatments lost an average of 16 pounds of inorganic nitrogen, while piles covered with polyethylene lost an average of 13 pounds of inorganic nitrogen, which the report states is "not significantly different."

It also was found that sawdust, Poultry Guard, bentonite clay, Soiltaac and spray-on carbon materials provided no benefit in reducing nutrient losses.

More conclusions from the study are listed below:

- On average, a 100-ton pile of poultry litter lost 12 pounds of nitrogen, which is a relatively small amount of nitrogen.

- About 75 percent of the nitrogen moved into the underlying soil from the poultry litter was in the surface 24 inches of soil, so establishment of a crop in the area of the pile would remove a significant portion of this nitrogen from the soil.

- The amount of nitrogen in properly shaped poultry litter piles and moving into the underlying soil was only about 0.2 percent of the amount of the nitrogen in the poultry litter.

- Litter spread at the wrong time of the year would have a much greater risk of nutrient loss than litter kept in a pile.

- If litter must be stored in the field, it should be kept in a pile until the appropriate spreading time for the crop to be grown.

- Recommendations that promote spreading litter sooner than is optimal for crop production practices should be discouraged — because litter spread too early will have much greater risk of nutrient losses than litter kept in a properly shaped litter pile.

- In-field storage of poultry litter facilitates the transport of poultry litter from areas with high concentrations of poultry litter to areas where there is a low concentration of poultry litter available for use during crop production.

- Current Delaware regulations on temporary stockpiling of poultry litter should be considered Best Management Practices and should be followed.

Stockpiling and Temporary Field Storage of Poultry Litter-Manure Standards

The following standards reference temporary storage of poultry litter-manure for all poultry operations and anyone handling poultry litter-manure.

The most efficient method of handling and storing poultry litter-manure results from handling the poultry litter-manure as few times as possible. Ideally, total cleanouts and crust outs are immediately land-applied, transported to an alternative use facility, or moved to

a storage structure. However, timing considerations may require temporary, outdoor storage of the total cleanout of litter-manure before use and must be conducted according to the Commission standards. In situations where temporary field storage is needed, litter-manure may be stored temporarily to preserve litter-manure quality and prevent application at the wrong time of the year. Temporary field storage is the least preferred storage practice but may be conducted according to the following standards:

Production Area Storage	Non-Production Area Storage Up to 90 Days	Non-Production Area Storage Over 90 Days to 150 Days
<p>“Production Area” means that part of an Animal Feeding Operation that includes the animal confinement area, the manure storage area, the raw materials storage area and the waste containment areas, also includes egg washing or processing facility and any area used in the storage, handling, treatment or disposal of mortalities. The Production Area should be defined in the operation’s Nutrient Management Plan.</p>	<p>Temporary Field Storage away from the “Production Area” can be staged for land application and is limited to 90 days without the use of an impervious cover.</p> <p>“Application Area” means land under the control of an Animal Feeding Operation owner or operator, whether it is owned, rented or leased, to which manure, litter or process wastewater from a production area is or may be applied.</p>	<p>For conditions that require temporary storage of litter-manure beyond 90 days, individual or general authorization may be granted by the DNMC or Delaware Department of Agriculture for storage up to 150 days. For any storage greater than 150 days, an impervious cover is required.</p>
<p>Stockpiling storage within the “Production Area” (as defined above) is limited to 14 days without the use of an impervious cover, but zero days is recommended.</p>		
<p>The following BMP(s) are required for Production Area Storage:</p> <ol style="list-style-type: none"> 1. The stockpile must be separated from any channeled runoff, standing water and other drainage systems such as roof runoff and down spouts. <p>These following additional BMPs are required for Production Area Storage of 2-14 days:</p> <ol style="list-style-type: none"> 2. The stockpile must be at least 6 feet high; and 3. The stockpile site must meet Natural Resources Conservation Service (NRCS) standard or other containment area lining (standards) approved by the DNMC. 	<p>The following BMPs are required for Non-Production Area Storage Up to 90 days:</p> <ol style="list-style-type: none"> 1. The pile must be at least 6 feet high and in a conical cross section shape; and 2. Litter-manure shall not consist of more than 5% crust out material; and 3. The selection of the temporary storage site must consider the highest, most practical site possible and shall not use the same site more than once every two years without a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; and 4. The temporary storage sites must be identified in the nutrient management plan; and 5. The site must be located at least 100 feet from a public road, 100 feet from any surface water and 200 feet from any residence not located on the property; and 6. The site must be at least 200 feet from a domestic well and 300 feet from a public water supply well; and 7. Post litter-manure removal treatment must include the removal of all litter-manure and the top 1-2 inches of topsoil if the topsoil is co-mingled with the litter-manure to prevent nutrient loads; and 8. A production crop or cover must be established and maintained at the site as soon as practical following post removal treatment. 9. For temporary storage sites on soils classified as located within 1.5 feet of the depth to the seasonal high water table, any <u>one</u> of the following practices must be implemented: <ol style="list-style-type: none"> a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; or b. The use of high carbon (content) material (straw, wood shavings, fodder) as the base of the pile at least 8 inches thick to serve as a barrier and easy post storage removal; or c. The use of powdered bentonite or similar material that will seal the area under the pile. 	<p>The following BMPs are required for Application Area Storage Over 90 days:</p> <ol style="list-style-type: none"> 1. The pile is to be constructed as large as possible and be at least 10 feet high and in a conical cross section shape; and 2. Litter-manure shall not consist of more than 5% crust out material; and 3. The selection of the temporary storage site must consider the highest, most practical site possible and shall not use the same site more than once every two years without a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; and 4. The temporary storage sites must be identified in the nutrient management plan; and 5. The site must be located at least 100 feet from a public road, 100 feet from any surface water and 200 feet from any residence not located on the property; and 6. The site must be at least 200 feet from a domestic well and 300 feet from a public water supply well; and 7. Post litter-manure removal treatment must include the removal of all litter-manure and the top 1-2 inches of topsoil if the topsoil is co-mingled with the litter-manure to prevent nutrient loads; and 8. A production crop or cover crop must be established and maintained at the site as soon as practical following post removal treatment; and 9. The establishment and maintenance of a 24-foot vegetative buffer surrounding the pile site. 10. For temporary storage sites on soils classified as located within 1.5 feet of the depth to the seasonal high water table, any <u>one</u> of the following practices must be implemented: <ol style="list-style-type: none"> a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; or b. The use of high carbon (content) material (straw, wood shavings, fodder) as the base of the pile at least 8 inches thick to serve as a barrier and easy post storage removal; or c. The use of powdered bentonite or similar material that will seal the area under the pile.

Winter Application of Fertilizer and Manure

Winter application regulations continue and limit the application of commercial and manure based fertilizer during the time of the year that is most vulnerable for nutrient runoff. The purpose of the

regulation is to limit the application of nitrogen (N) and phosphorus (P) fertilizer and manure applications as follows, unless specified in the nutrient management plan that the application is necessary:

- The application may not occur between December 7 and February 15;
- The application may not occur on snow covered or frozen ground;
- The application may not occur on impervious surfaces such

as sidewalks, roads and other paved areas and the misdirected fertilizer must be removed on the same day of application. Failure to comply with these and other regulations of the Commission may result in a compliance and enforcement hearing of the Commission.

Budget

The Nutrient Management Commission's accomplishments were made possible with funding provided by the Legislature. The Nutrient Management Program continues to implement nutrient planning, relocation and mandated activities as required by the Nutrient Management Law.

The following budgets are represented as fiscal years.

	FY 2008 Budget	FY 2009 Budget	FY 2010 Recommended Budget
Program Operating Costs:			
Personnel	257,000	251,600	282,200
Federal Funds Section 319 (Clean Water Act)*	30,000	30,000	0
Travel	5,500	5,500	5,500
Contractual	17,000	17,000	17,000
Supplies	4,000	4,000	4,000
Information/Education/Certification	221,000	221,000	221,000
Nutrient Relocation Program	246,000	246,000	246,000
Federal Funds section 319 (Clean Water Act)*	200,000	200,000	200,000
Federal Funds NRCS*	90,000	0	0
Federal Funds Ches. Bay Program*	110,000	110,000	110,000
Poultry Companies*	53,863	125,499	200,000
Nutrient Management Planning	451,800	0	0
Nutrient Management Planning from Pesticide Revenues	0	451,800	451,800
Demonstration and Research	1,505	0	0
Penalties Collected	1,050	1,906	0
TOTAL	1,689,418	1,664,305	1,737,500

* All bold text represent funds that are not appropriated by the State of Delaware.

Background and Contacts

What is the Delaware Nutrient Management Commission?

The Nutrient Management Law established a 19-member Commission that is charged to develop, review, approve and enforce regulations governing the certification of individuals engaged in the business of land application of nutrients and the development of nutrient management plans. The members of this Commission come from many different backgrounds and professions.



The Commission's Chair, Bill Vanderwende, was awarded the Secretary of Agriculture's Distinguished Service to Agriculture this year. Secretary Ed Kee said, "Bill Vanderwende is a longstanding member of the farming community and a tireless public servant. He is equally committed to agriculture as he is to protecting and conserving our environmental resources for future generations."

Members of the Nutrient Management Commission

William Vanderwende, Commission Chairman, was appointed to the Commission by the Senate, and was named Chairman by the Governor. A full-time Sussex County dairy producer, he represents the state's dairy industry. He operates a farm with 700 head of dairy, and 3,000 crop acres. He can be reached at (302) 349-4423.



David Baker, Commission Vice Chairman and Chairman of the Personnel and Planning Subcommittees, was appointed by the Senate as a representative of the New Castle County grain industry. He is a full-time grain farmer of 3,000 acres. He can be reached at (302) 378-3750.

Mark Adkins was appointed by the Governor to represent swine farmers. He operates a 900-acre family grain farm and 1,000-head swine farm and is a director for the Delaware Pork Producers. He can be reached at (302) 732-3007.



Robert Baldwin, Director of the Department of Natural Resources and Environmental Control Division of Soil & Water Conservation is appointed by the Nutrient Management Law. He can be reached at (302) 739-9921.

F. Kenneth Blessing, Jr. was appointed by the Senate to represent Kent County vegetable farmers. He is part of a diversified farming operation consisting of approximately 3,500 crop acres including vegetables, grain and beef cattle. He can be reached at (302) 422-5746.



I. Nyle Callaway was appointed by the Governor as a Kent County public citizen representative. A waste water treatment em-ployee for Kent County, he represents equine farming operations. He can be reached at (302) 422-4094.



Scott Webb was appointed by the House of Representatives to represent Kent County poultry farmers. He is part of a family farm that operates a 119,000 capacity broiler operation and farms 1,000 acres of grain crops. He can be reached at (302) 381-0402.



Jim Elliott was appointed by the House of Representatives as an Environmental Advocacy Group representative. Former Mayor of Fenwick Island, he is no stranger to public service. He can be reached at (302) 337-3653.



Edwin Kee, Secretary of the Delaware Department of Agriculture, is an ex-officio member of the Commission. He can be reached at (302) 698-4500.



Laura Hill was appointed by the House of Representatives to represent Sussex County poultry farmers. She is part of a family farm that operates a 130,000 capacity broiler operation and farms

Dr. Gerald Llewellyn serves for Secretary and is Chief of the Environmental Health Evaluation and Toxicology Branch at the Division of Public Health, within the Department of Health and Social Services. His position is ex-officio. He can be reached at (302) 744-4824.



3,000 acres of grain and vegetable crops. She can be reached at (302) 945-0725.

Al Johnson, Jr. was appointed by the House of Representatives to represent commercial applicators in Kent County. He owns and operates Air Enterprises, Inc in Magnolia. He can be reached at (302) 335-5454.



David Small, Acting Secretary of the Delaware Department of Natural Resources and Environmental Control, is an ex-officio member of the Commission. He can be reached at (302) 739-9000.



Tony Keen, Chairman of the Technology Subcommittee, was appointed by the Senate as a nutrient consultant. He has owned and operated a private crop consulting firm since 1980. He can be reached at (302) 684-5270 (w) or (302) 684-3196 (h).

Delaware Nutrient

Management Program Staff

William Rohrer, Jr. is the Program Administrator of the Delaware Nutrient Management Program and an ex-officio member of the Commission. He can be reached at (302) 698-4500 or william.rohrer@state.de.us.



Bud O'Neill was appointed by the Governor to represent the golf course/lawn care industry. He owns an agronomic service firm that plans and manages turfgrass for golf courses, athletic complexes and lawns. He is past chairman of the Delaware State Golf Association greens section. He can be reached at (302) 653-8618.



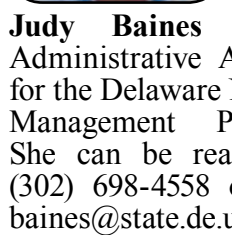
Carl Solberg, Chairman of the Program & Education Subcommittee, was appointed by the Senate. He represents the Environmental Advocacy Group, and is a volunteer for the Delaware Chapter of the Sierra Club. He can



Bob Coleman is the CAFO/Nutrient Management Coordinator for the Delaware Nutrient Management Program. He can be reached at (302) 698-4556 or robert.coleman@state.de.us.

be reached at (302) 492-1225.

Richard Sterling was appointed by the Governor as a representative of the commercial nursery industry. He operates a 75-acre nursery specializing in evergreens. He can be reached at (302) 653-7060.



Judy Baines is the Administrative Assistant for the Delaware Nutrient Management Program. She can be reached at (302) 698-4558 or judy.baines@state.de.us.



Rachel Epps is assisting part-time with the office operations of the Nutrient Management Program. She can be reached at (302) 698-4500 or rachel.epps@state.de.us.

University of Delaware Staff

Several specialists from the University of Delaware provide certification training for the Nutrient Management Program. They also assist the program by providing technical recommendations and by conducting research and demonstration projects on nutrient management practices. They are:

Dr. Greg Binford is an Associate Professor of Soil and Water Quality. He is responsible for educating the public about nutrient management and the impact that nutrient management can have on water. He can be reached at (302) 831-2146.



Dr. David Hansen is an Associate Professor of Soil and Environmental Quality, Extension Nutrient Management Specialist and Agricultural Leader. His extension activities include developing and conducting nutrient management training courses in support of the Delaware Nutrient Management Program. He can be reached at (302) 856-7303.



Sydney Young Riggi, Nutrient Management Extension Associate. She can be reached by calling (302) 856-2585, Ext. 571.

Shawn Tingle is a Nutrient Management Extension Associate. He can be reached by calling (302) 856-2585, Ext. 572.



Several other University employees assist in the training, research and demonstration projects. They are:

Warren Willey, Nutrient Management Extension Associate, (302) 856-2585, Ext. 557.

Roseann Ferri, Secretary, (302) 856-2585, Ext. 550.

Gordon Johnson, Kent County Extension Ag Agent, (302) 730-4000.

Anna Stoops, New Castle County Extension Ag Agent, (302) 831-8860.

Corey Whaley, Sussex County Extension Ag Agent, (302) 856-2585, Ext. 594.

How to Contact Your Conservation District

The Conservation Districts provide technical agricultural professionals who can assist in nutrient management strategies and recommendations. All nutrient consultants are certified and in most cases, Certified Crop Advisors.

New Castle County: (302) 832-3100

Kent County: (302) 741-2600

Sussex County: (302) 856-3990

How to Contact the Nutrient Management Program

Information about the Nutrient Management Program can be found on the Internet at www.state.de.us/deptagri/nutrients/index.shtml.