



# Delaware Nutrient Management Commission

April 1, 2011



## Introduction

2010 was an important year for nutrient management.

During 2010 the Nutrient Management Program in cooperation with DNREC implemented new Concentrated Animal Feeding Operation (CAFO) Regulations. Also new outdoor manure staging and storage regulations were developed and a new set of nutrient management State Technical Standards were written.

As in previous years, farmers and other nutrient handlers are required to develop and implement phosphorus-limited nutrient management plans, maintain nutrient handling records, maintain nutrient certification and submit an annual report.

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 practices and demonstrating accountability.

### *Nutrient Management Law Implemented*

The Nutrient Management Law was passed in 1999 and mandates that all farmers, golf courses 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 are comprised 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. In the past several years, the U.S. Environmental Protection Agency (EPA) has become much more interested in agriculture's influence on water quality and how Delaware officials, such as the Commission, were regulating nutrient runoff. EPA recognizes the success of the Nutrient Management Law but is very focused on two elements of the Clean Water Act called Concentrated Animal Feeding Operation (CAFO) permits and Total Maximum Daily Load (TMDL) limits. Both elements consist of EPA regulations that the states must address.

The Commission is working jointly with the Delaware

Department of Agriculture (DDA) and the Department of Natural Resources and Environmental Control (DNREC) to evaluate these federal requirements. The University of Delaware and the NRCS are valuable resources for understanding and addressing these requirements.

### *Organizational Purpose*

The organizational structure of the Nutrient Management Program is important. It is also critical as budget shortfalls within state government persist and difficult decisions are needed. The mission of the Commission 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:

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## Strategic Goals

1. Promote alternative use practices for excess nutrients generated in Delaware by developing and implementing incentive and market-based programs.
2. Institute a program to assist in developing and funding nutrient management plans according to law and program standards.
3. Implement nutrient management certification requirements by providing nutrient handlers with initial and continuing educational opportunities.
4. 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.
5. Develop and implement demonstration projects within the farm community for best management practices.
6. Audit nutrient management activities to instill legal compliance and high quality services.
7. Respond to informal and formal complaints against nutrient management practices.
8. Recognize environmental stewards within the agricultural community with the cooperation and financial support of the agri-businesses and poultry companies operating within the state.
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.

## Performance Measure Goals

	FY2008 Actual	FY2009 Actual	FY2010 Actual
Tons of poultry litter/manure relocated within Delaware for land application	28,604	20,107	28,791
Tons of poultry litter/manure exported from Delaware for land application	19,640	19,396	20,684
Tons of poultry litter/manure relocated to an alternative use project	38,592	26,020	33,836
% 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	97,043	76,828	129,235
# of nutrient consultants	106	74	109
# of commercial handlers	66	50	74
# of private applicators	1,129	1,130	1,130
# of nutrient generators	478	470	470
# of nutrient management farm audits	20	34	6
# of constituent complaints:			
received	48	36	21
resolved	46	35	20
# of CAFO permits	15	372	372

## 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, 1,783 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](http://dda.delaware.gov/nutrients/forms/2009/020409_Certified%20Users.pdf)):

1. 470 Nutrient Generator certifications valid for three years;
2. 1,130 Private Nutrient Handler certifications valid for three years;
3. 74 Commercial Nutrient Handler certifications valid for one year;

4. 109 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 2010, 18 different classes were offered for initial certification along with six different testing opportunities. The number of continuing education credits offered continued to increase in 2010. Public and private organizations conducted 125 continuing education programs, offering a total of 325.75 continuing education credits. A total of 3,162 individuals attended these programs.

In order to become certified as a consultant or a commercial nutrient handler, one must pass an examination. Three examination sessions for nutrient consultants and three examinations for commercial nutrient handlers were offered in 2010, resulting in 17 (71%) passing scores and 7 (29%) failing scores. Nutrient consultant test questions



**The University of Delaware Cooperative Extension conducts most of the nutrient management certification classes. Here, University of Delaware Associate Professor Dr. David J. Hansen teaches a class.**

are pulled from a databank of questions shared by Delaware, Maryland, Virginia and Pennsylvania for reciprocal purposes. The test sessions also are coordinated with the national Certified Crop Advisor (CCA) program to expand the opportunities for crop consultants. University and Program Staff generated the exam for commercial nutrient handlers. All certifications, except Nutrient Consultants, are valid for a three-year period. Nearly one-third of

all certifications will expire on May 1, 2011.

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 quarter-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 Initial Certification Classes

Certification Session	# of Sessions	Total Attendance
Session I: General	5	108
Session II: Nutrient Generator	5	104
Session III: Private Nutrient Handler	4	50
Session IV: Commercial Nutrient Handler	2	7
Session V: Nutrient Consultant	2	18
Commercial Nutrient Handler Exam	3	6
Nutrient Consultant Exam	3	18

### Summary Delaware Nutrient Management Program Approved Continuing Education Programs

Year	Number of Programs	Number of Continuing Education Credits Available	Attendance
2006	56	113.95	1930
2007	92	200.75	3028
2008	95	234.75	2033
2009	119	253	3260
2010	125	325.75	3162

## Rohrer Steps Down as Program Administrator

Bill Rohrer, who led the Delaware Nutrient Management Program since its inception, stepped down in April 2010. Rohrer took the reins of the program in December 1999 at a time when Delaware agriculture was under great pressure to make environmental improvements. Under his leadership, many steps were taken to meet the complex environmental challenges facing Delaware farmers. Some of these were:

- Starting the Manure Relocation Program to ensure litter-manure was exported from areas where it could only be land applied as a waste product to those areas where it could be applied in an environmentally appropriate manner;
- Instituting Mandatory Nutrient Management Planning to ensure farmers had a blueprint for the correct application of nutrients;
- Writing the first Concentrated Animal Feeding Operation (CAFO) regulations for the state;
- Starting the Environmental Stewardship program to recognize Delaware farmers who maintain the highest level of environmental accountability;
- Implementing new regulations such as the ban on winter spreading of nutrients.

Prior to his appointment as Program Administrator, Rohrer worked with the Maryland Nutrient Management Program, Brubaker Agronomic Consulting and Sycamore Lane Nursery. He also served for four years as an artillery officer with the U.S. Army. He is a '92 graduate of West Virginia University, College of Agriculture.

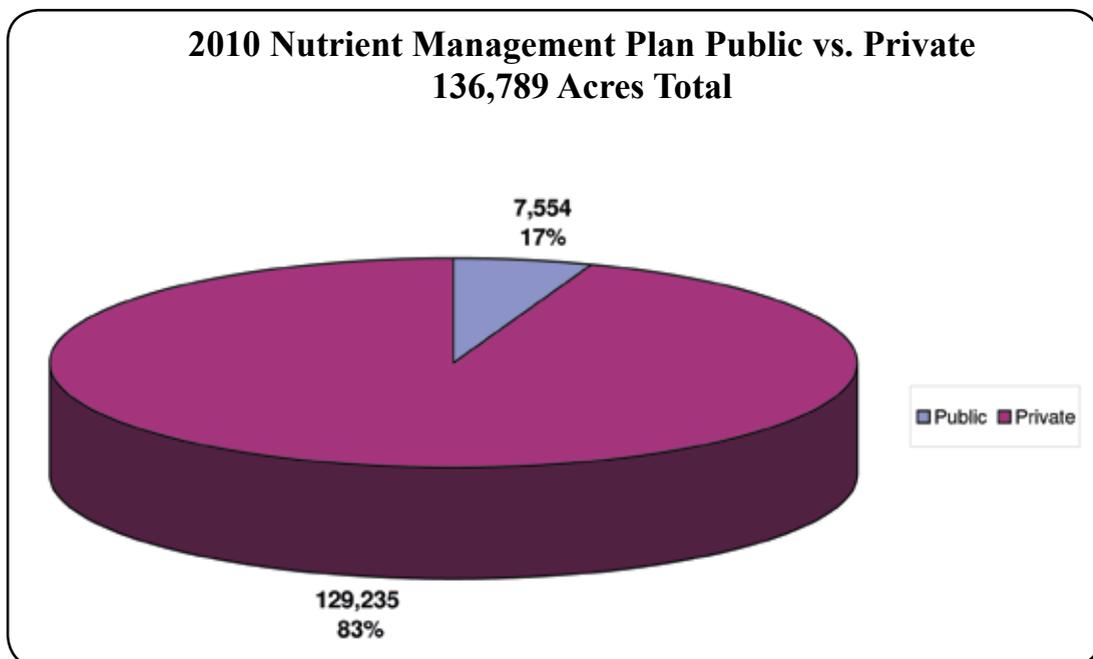


Bill Rohrer

## 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 2010, 157 farms, two turf farms, two nurseries and two golf courses — representing 129,235 acres — were reimbursed at a capped rate for a plan developed by a private consultant. Kent and Sussex Conservation Districts assisted 35 farms representing 6,416 acres in the development of nutrient management plans. These acres represent an obligation for at least three years of nutrient management planning. Also, 103 farms were assisted with an animal waste management plan or comprehensive



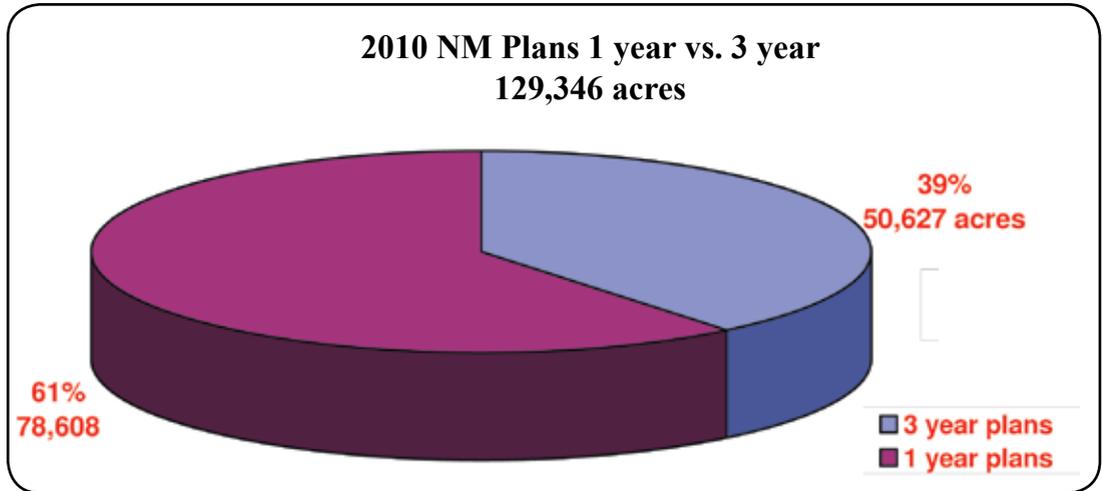
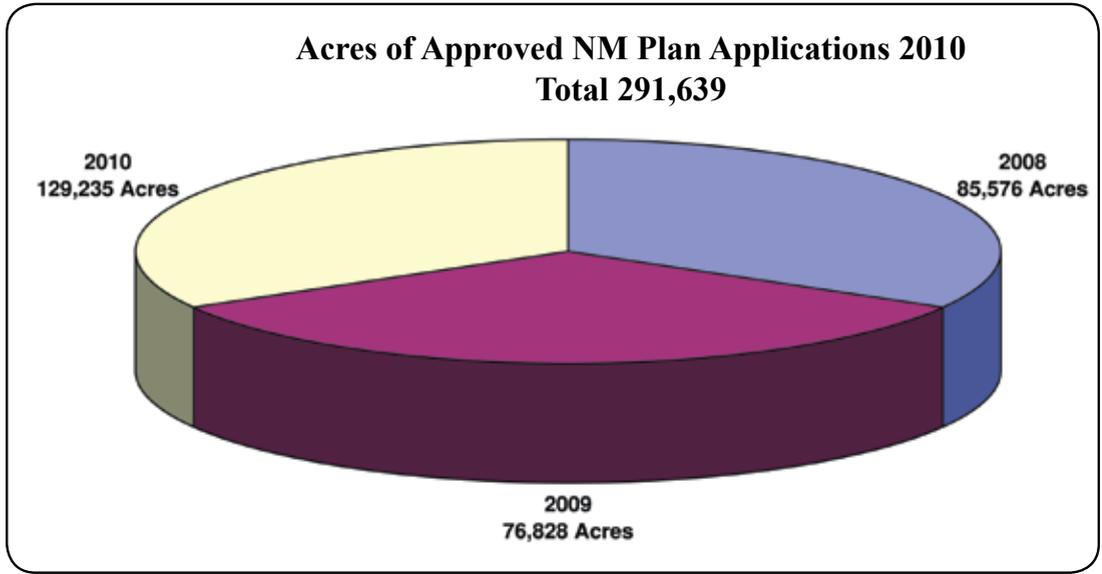
nutrient management plan.

During 2010, Delaware farmers applied and were approved for a total of 129,235 acres of nutrient management planning. The total acreage covered by nutrient management planning reimbursement during 2010, including those farms approved during 2008 and 2009, was 291,639 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 law did not affect the remaining property owners. The notification process resulted in 453,291 acres (100%) of cropland being notified of nutrient management requirements.



### Nutrient Reports due March 1

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. For 2010, the program received 331 reports, which will be entered into a watershed-based database for aggregating progress and accountability.

### Nutrient Management Plan Audits

Each year the program staff audits a number of facilities required to operate with a nutrient management plan, records and certification. This process helps to ensure that plans meet the intent of the nutrient management laws and regulations. During 2010, program staff audited the nutrient management plans for six agricultural operations and one concentrated animal feeding operation.

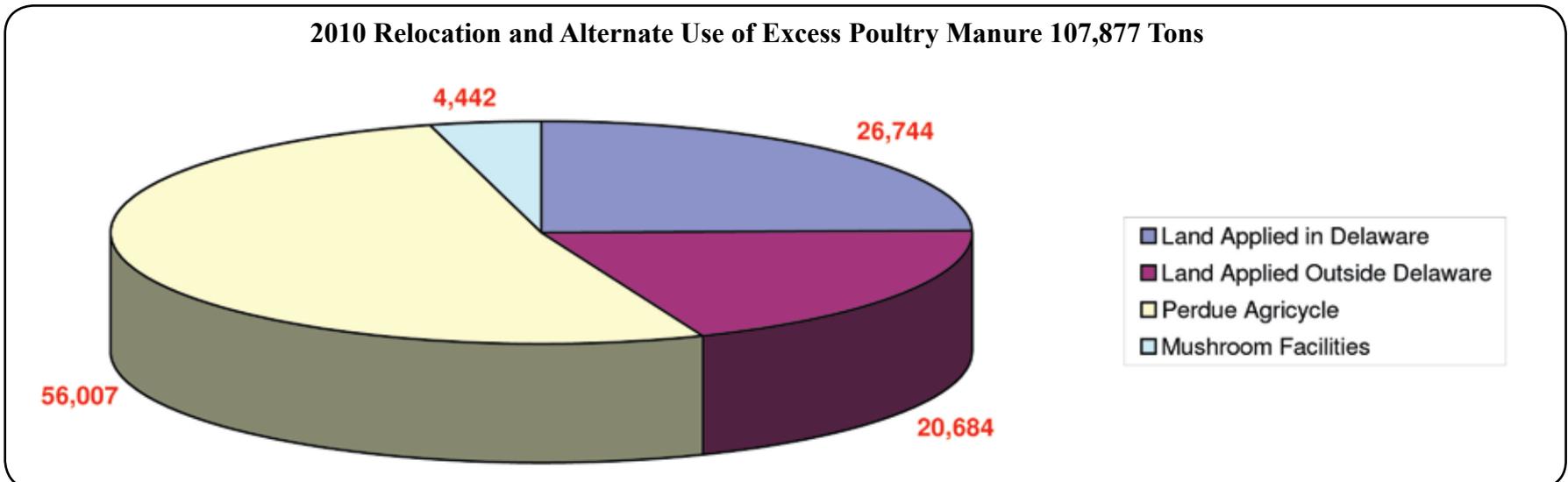
## Nutrient Management Relocation

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 generated in their operations. Many businesses now 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, New Jersey, and Virginia. Alternative use projects are essential for managing excess poultry manure. In 2010, 107,924 tons of excess poultry litter-manure were relocated, an eight-year total of over 600,000 tons. Over

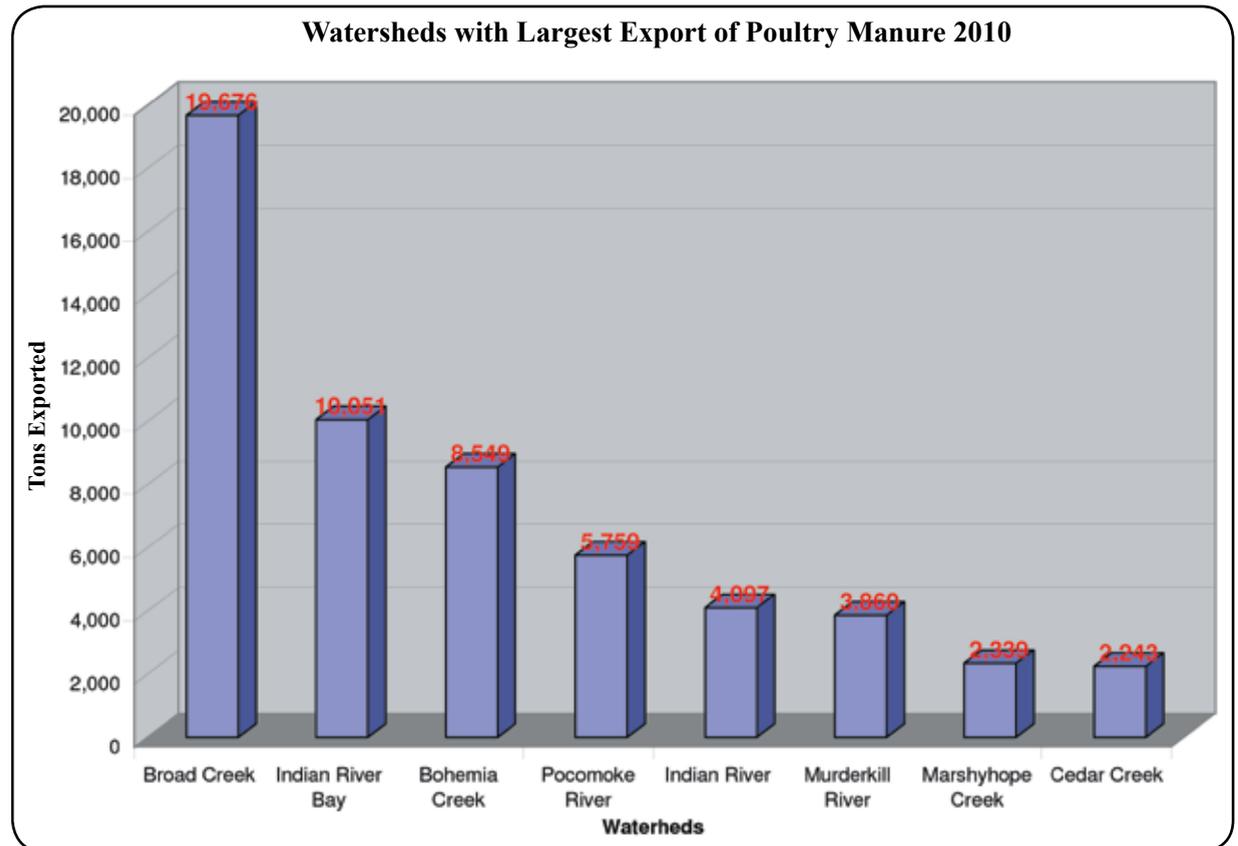
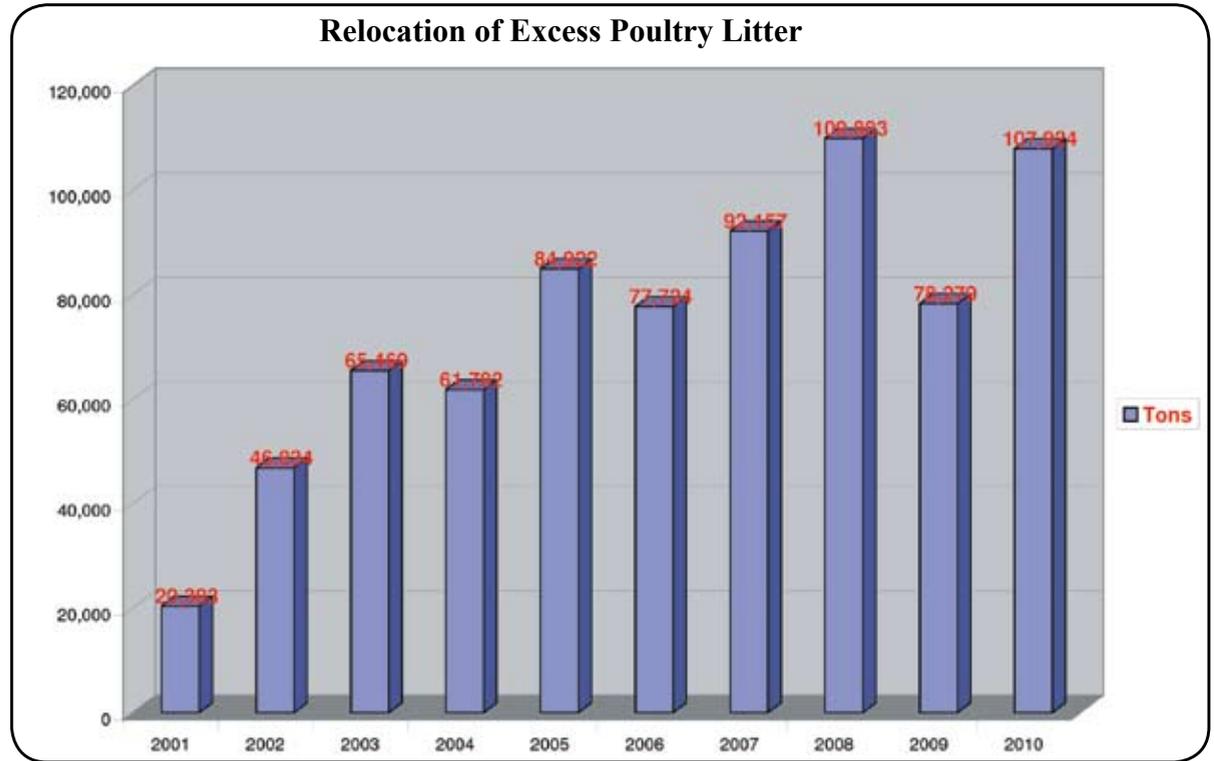


70% of the excess litter-manure goes to alternative use projects such as the Perdue AgriRecycle fertilizer plant in Blades, Del., and mushroom growers in Pennsylvania. The plant processed a total of 52,800 tons in 2010, 29,394 tons being Delaware-generated.

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.



The Perdue AgriRecycle Plant in Blades, Del., processed a total of 70,824 tons of poultry litter/manure in 2009, 39,508 tons of it generated in Delaware.



## FY 2010 Relocation Summary

Relocation Category	Tonnage
Delaware relocation projects with financial assistance	107,924
Perdue AgriRecycle Inc. without relocation assistance	23,406
Ellis Farms Inc. Brokerage without relocation assistance	9,000
<b>Total Excess poultry litter relocated</b>	<b>140,440</b>
DE Relocation Program (financial assistance)	
Farm to Farm within DE	26,791
Farm to Farm exported from DE	20,684
Farm to Alt. Use: Perdue AgriRecycle	29,394
Farm to Alt. Use: Mushrooms	4,442

## Markets for Excess Manure

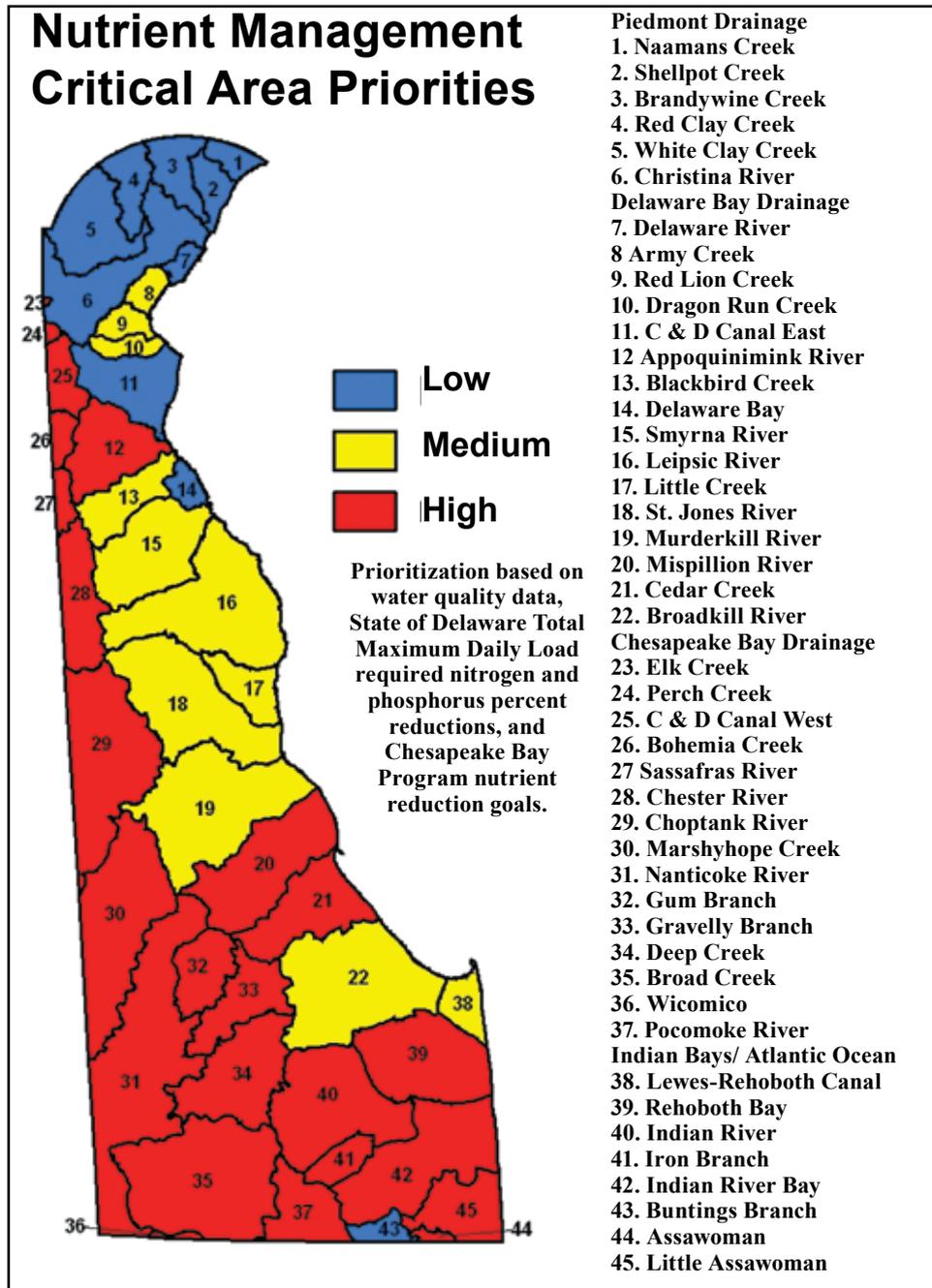
The following businesses have expressed interest in taking or buying excess manure for alternative use and/or brokerage. Please contact them directly:

Manure Type	Company
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

*Note: Excess poultry litter/manure is defined as litter/manure generated from a Delaware farm with high soil phosphorus levels or insufficient land and relocated to a farm with soil phosphorus levels below 150 Fertility Index Value or an alternative use project.*

# 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 — Allen Family Foods, Inc., Mountaire Farms, Inc. and Perdue Farms, Inc. — to recognize the 2010 environmental stewards.

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 recognizes growers by evaluating nutrient management, best management practices, farm management, innovation, bio-diversity and wildlife management.

The 2010 Delaware Environmental Stewardship Award was presented during the Delaware Agriculture Week conference held at the Delaware State Fairgrounds in Harrington. Frank Robinson and family of Harrington received the 2010 Environmental Steward Award and were presented with a cash award of \$1,000, a lane sign and a plaque. The Robinsons operate Dead Broke Farm, a 182,000-capacity poultry farm growing for Perdue Farms

Other environmental stewardship nominees receiving a lane sign, a plaque, and awards of \$500 were:

The Shane Carter Family, owners and managers of Redden Acres in Harrington. Shane and Danna Carter manage a 73,000-capacity broiler farm and grow for Allen Family Foods.

The Darrell Lewis Family, owners and managers of the Lewis Farm in Laurel. Beth Ann, Darrell, and Dillon Lewis manage a 143,000-capacity broiler farm and grow for Mountaire Farms.

**Below, from left, are The Hon. Ed Kee, Delaware Secretary of Agriculture; Bill Vanderwende, Chairman, Delaware Nutrient Management Commission; Ray Robinson; Bernadette Robinson; Frank Robinson; The Hon. Tom Carper, U. S. Senator; and Larry Towle, Delaware Nutrient Management Program Administrator.**





Left to right: Tom Brinson, Corporate Environmental Manager, Allen Family Foods, Inc., congratulates Danna and Shane Carter.



Left to right: Dillon Lewis, Beth Ann Lewis and Beth Sise, Vice President of Mountaire Farms, Inc.

## Permits for Certain Animal Feeding Operations

The Nutrient Management Program manages the National Pollution Discharge Elimination System (NPDES) 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). 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

### *New CAFO Regulations Adopted*

During 2009 and 2010, the Commission, DDA, DNREC, NRCS and the University of Delaware worked towards meeting EPA requirements for a CAFO program tailored to Delaware’s unique circumstances. During a series of meetings, all parties worked to satisfy the legal and regulatory directives, and protect the environment. This regulatory development effort was often discussed during the Commission’s monthly meetings. In addition, DDA, DNREC, and Commission staff met with the Delmarva Poultry Industry Environmental Committee on May 11, 2010, to present the Draft CAFO Regulations.

The draft regulations were presented to the public in a series of three public workshops on May 25-27, 2010, at the Farmington Fire Hall, Laurel High School and Millsboro Fire Hall. A total of 143 people attended. The input received at those public workshops resulted in revisions to the draft regulations. DDA, DNREC, and Commission staff informed members of the Delaware General Assembly of CAFO regulation development progress at two meetings. The first, on April 28, 2010, was a joint meeting of the House and Senate Agriculture Committees, and the second on June 2, 2010, was a presentation before the House Agriculture Committee.

Due to feedback received from the public workshops and EPA, the Draft CAFO Regulations were revised. The revised Draft CAFO Regulations were then presented to the public for comment during the months of June and July 2010. DNREC and DDA published the complete Draft 7201 Regulations Governing the Control of Water Pollution, Section 9.5 in the July 1, 2010, Delaware Register of Regulations. A Public Hearing was held at the Delaware Department

of Agriculture building in Dover, on July 22, 2010. The new CAFO Regulations became effective on November 11, 2010

Poultry farmers and other livestock operations in Delaware that are identified as CAFOs, or those with a discharge, will need to apply for a CAFO permit within 90 days after the effective date of the regulations. To apply for the permit, farmers were required to submit a signed Notice of Intent (NOI) and a copy of their most recent nutrient management plan (NMP) or animal waste management plan (AWMP) to the Delaware Department of Agriculture (DDA) on or before February 9, 2011.

Operations that are not currently defined as CAFOs but will become a CAFO in the future will need to submit a NOI at least 180 days prior to beginning operations or as assigned by the Secretary of Agriculture.



Most Delaware CAFOs are poultry farms.

Producers and the public that have questions about CAFOs and the regulations may go to the DDA website [www.dda.delaware.gov](http://www.dda.delaware.gov) and find a copy of the regulations, Frequently Asked Questions (FAQs), and the NOI form. Those without computer access may call DDA directly for assistance and for hard copies of the regulations, FAQs, and the NOI.

Listed below are selected items from the FAQs:

- The owner or operator of any CAFO that discharges pollutants or proposes to discharge pollutants into the waters of the State is required to seek a NPDES CAFO permit.
- In general, a discharge occurs in situations when animal manure is improperly stored, handled incorrectly, or over-applied as defined by the nutrient management plan.
- The permit requires the farm to implement a nutrient management plan written by a certified plan writer, maintain records of nutrient handling activities, submit an annual report, maintain nutrient management certification and implement Best Management Practices (BMPs) on the farm to prevent a discharge.
- There is no fee for the permit.
- Any farm that operates under a CAFO permit is subject to periodic inspection by Program Staff.
- The Delaware Department of Agriculture can assist owners and operators by providing a self-assessment/risk assessment tool that will help them make a determination of discharge.
- Acquiring a NPDES CAFO permit and implementation of associated BMPs will help provide protection to the owner-operator against action by the state and federal governments and against citizen suits if a discharge should occur.
- The Secretary of Agriculture may request additional information or changes to be made to the Nutrient Management Plan if necessary and all NOIs will be subject to public review.
- The permit application process will take a minimum of 60 days for approval after the NOI application is submitted.
- Permits may be granted for up to five years.
- Records must be maintained on site for six years.

### ***Program Structure***

The U.S. 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 implement the Delaware CAFO program under a formal agreement signed by the respective Cabinet Secretaries in June 2000. This agreement was renewed in December 2010. The Nutrient Management Commission oversees the implementation of the State Nutrient Management Law and the administrative staff. CAFO regulations were adopted by DNREC and DDA, and first became effective September 10, 2005. Updated CAFO regulations took effect in December 2010. Nutrient Management Program staff is primarily responsible for the enforcement of the CAFO regulations.



**Good housekeeping and manure handling in the production area is a must for all farms holding a CAFO permit.**

### ***New State Technical Standards***

During 2010, EPA initiated actions requiring all the Chesapeake Bay states to adhere to total maximum daily loads (TMDLs) for nitrogen, phosphorus and sediment. Each of these states was required to draft a Watershed Implementation Plan (WIP) laying out water quality goals and a path forward to meet the federally imposed TMDLs. Part of Delaware's plan for meeting the TMDLs was the successful implementation of our new CAFO regulations. Integral to the CAFO regulations are the accompanying state technical standards (best management practices). These serve as a guide to the proper implementation of the CAFO regulations. Referenced throughout the CAFO regulations are various technical standards for both the production and manure application areas. Use of these standards is crucial for nutrient plan writers, nutrient handlers and agricultural operators. Such use will ensure regulatory compliance when properly implemented. During the summer of 2010, EPA initiated a review of the Bay states' technical standards as related to the manure applications area.

In order to meet the state and federal requirements, Secretary of Agriculture Ed Kee formed the Delaware State Technical Standards Review Committee. The Committee was comprised of a group of policy makers from the Nutrient Management Commission, Department of Agriculture, the Department of Natural Resources and Environmental Control, the University of Delaware, USDA/NRCS, USDA/FSA, and the private sector. All of the Nutrient Management Program's best management practices were reviewed, redrafted, and reformatted. In total, 42 technical standards have been completed to date. Each standard has been peer reviewed. The technical standards are posted on the Department of Agriculture's webpage at <http://dda.delaware.gov/>. Although the standards are currently in interim form and recommended for use, public feedback is welcome. In addition, EPA has not yet completed its review of the standards and, based on EPA feedback, some standards may be modified in the near future. EPA identified 28 of the total 42 standards as relevant to its review criteria and then further refined the list to just six standards which require full review. It is expected that all State Technical Standards will be finalized by Summer 2011.

## **Total Daily Maximum Load (TMDL) and The Chesapeake Bay Watershed Implementation Plan (WIP)**

President Barack Obama signed an Executive Order on May 12, 2009, recognizing the Chesapeake Bay as a "national treasure." He called upon the federal government to lead a renewed effort to restore and protect the nation's largest estuary and its watershed. States within the bay's watershed will be expected to do their individual parts in cleaning up the bay. Delaware is taking proactive measures to be able to meet new regulations that may come along. During 2010, nearly 100 farmers in the Choptank and Gravelly

Creek watersheds cooperated in a pilot program in an effort to create factual information about nutrient and land use efficiency.

The U.S. Environmental Protection Agency was charged with defining the next generation of tools and actions to restore water quality in the bay and to describe changes to be made to regulations, programs and policies to implement these actions. The EPA's draft report on water quality, submitted in September 2009, includes

significant potential changes to existing programs. EPA proposes to develop new regulations for the Chesapeake Bay to significantly reduce runoff pollution from urban, suburban and agricultural sources. The EPA is establishing a federal Total Maximum Daily Load (TMDL) for nutrients and sediment for the bay and its tidal tributaries. It was completed in December 2010. The bay TMDL will allocate loadings of nutrients and sediment to all jurisdictions in its watershed.

EPA published regulations in 1992 establishing TMDL procedures. A TMDL represents the maximum amount of a pollutant that a body of water may receive and still meet its water quality standards, with a margin of safety. Pollutants are anything that prevents a water body from attaining the national goal of being “fishable and swimmable.” The “loadings” are allocated to sources contributing to the problem. A TMDL is comprised of waste load allocations for “point sources” such as sewage treatment plants, urban stormwater systems and large animal feeding operations, load allocations for non-point sources such as polluted rainfall runoff from agricultural lands and impervious surfaces, and a margin of safety.

EPA is working with its partner states and the District of Columbia to develop individual Watershed Implementation Plans (WIP) and an overall TMDL implementation framework. The WIP will identify specific reduction targets by geographic location and sector to achieve allowable loadings, as well as a description and schedule of actions that the states, D.C., and local decision makers will take to achieve these reductions

A meeting was held in Delaware in September 2009 to explore ideas in addressing performance-based nutrient management, for the purpose of establishing better accountability for agriculture. The group’s goals were to provide accountability, paperwork relief and measurable nutrient load reductions. A plan was presented to the Commission and approved. During 2010 Program staff and commissioners worked closely with DNREC to develop the state’s new WIP strategy.

In addition, a pilot project was developed for the Choptank and Gravelly Branch watersheds. In a letter to nutrient handlers in those watersheds dated Feb. 1, 2010, then Nutrient Management Program Administrator Bill Rohrer explained: “There may be a significant ‘data gap’ between EPA’s assessment of conservation practices and the State’s assessment. The only way the State can report to the public and the EPA on progress within Delaware agriculture is by

your cooperation in providing accurate information.”

Nutrient handlers received annual reports to complete for 2007 through 2009. Each included a standard nutrient management report and a specific report for the Choptank or Gravelly Branch watersheds for the past three years. Rohrer explained, “The watershed specific report is part of a pilot project and should only represent crop and nutrient activities for that particular watershed. By law, your individual reports are protected from public view, and will only be available to the public in an aggregated watershed report. Your time involved in completing this report will be minimal but necessary.” Participating farmers received a minimum of one nutrient management certification credit for completing the report.

“The Commission will evaluate the results of these watershed reports and will determine the best use of the data,” Rohrer wrote. “We also plan to provide feedback on your specific farm as a report on nutrient efficiency performance.”

— Carol Kinsley, American Farm Publications



Proper use of TMDLs will enhance water quality in Delaware.

## Storm Water Control for Animal Feeding Operations

For the past several years, many farms experienced EPA and state inspections where the runoff of stormwater 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. Some of the critical BMPs that will assist in preventing runoff from polluting nearby waters follow:

- Time 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. A proper procedure during clean-out and crust-out can prevent litter-manure from entering the environment and is essential. Many of the proposed BMPs include maintenance of grass around poultry houses, manure shed, and any ditches or waterways. Vigorous, well maintained grass areas between watercourses and poultry houses, manure sheds and composters will provide healthy vegetation that will facilitate filtering of nutrients and trapping sediments.

3. Follow new farm construction recommendations for poultry houses, manure sheds and composters. For those houses and manure sheds that



Farm ponds that drain the production area are excellent BMPs for nutrient and stormwater management.

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
- Water-bodies, 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. These 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 current 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 Memorandum of Understanding. The chief executives of all poultry companies operating in Delaware, DDA, and DNREC signed this document. The document expands on the legal requirements to submit an annual report to the Commission outlining the accomplishments and strategy for nutrient management. On August 1, 2007, a new agreement, The Water Quality Cooperation Agreement for Nutrient Relocation and Alternative Use for Poultry Litter-Manure, was signed. The agreement dealt with the general strategy of 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. Allen's Hatchery Inc., Mountaire Farms of Delmarva, Mountaire Farms of Delaware, and Perdue Farms Inc submit the annual reports.

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 and 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 Family Foods reported the following:



1. 3,000 tons of excess poultry litter was exported from company-owned farms and land applied on cropland with low soil phosphorus levels;
2. Still records 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 as private nutrient handlers;
5. Continuing utilization of in-house windrowing to reduce the amount of excess litter-manure generated.

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 1,084 ton reduction of total phosphorus from phytase use in three Mountaire feed mills;
4. Grower outreach to expand and continue nutrient management education;
5. Continuation of nutrient management certification for all servicemen;
6. Assisted in funding and participated in water quality and air quality research projects.



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

1. Live Production personnel received training from EPA Region 3 on the specifics of the Perdue/EPA Clean Waters Environmental Initiative which included the federal and state CAFO program as well as the on-farm assessment process. Continued nutrient management training of all corporate environmental service and flock service employees;
2. Live Production personnel received training from the University of Delaware and all received Nutrient Generator certification status.
3. Perdue AgriRecycle pellet fertilizer plant that serves as essential alternative for growers from all three poultry companies and through June 2010 has handled 694,000 tons of litter. In 2008-2009 over 50% of the nutrients recycled were removed from the Chesapeake Bay watershed.
4. Recorded a 2,864 ton reduction in inorganic Phosphorus addition to feed resulting from phytase use;
5. Funded and participated in nutrient management related research projects valued at \$417,929.



## Nutrient Management and the Equine Industry

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 racetracks. 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 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.

**Horse manure and wash down water should be managed in a way to prevent nutrients from entering public 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.

Twenty-one 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:

<b>Complaint Category</b>	
Manure management	57%
Mortality Management	0%
Odor	43%
Fertilizer Management	0%
<b>Operation Type</b>	
Poultry	97%
Horse	1%
Field Crop Only	0%
Swine	1%
Dairy	0%
Beef	1%

## Nutrient Management Mass Balancing

*The following report was provided by Dr. Tom Sims, Professor of Soil and Environmental Chemistry and Associate Dean for Academic Programs and Research College of Agriculture and Natural Resources at the University of Delaware. Principal project investigators were Dr. Sims, Dr. Joshua McGrath, University of Maryland, and Dr. Amy Shoher, University of Florida. Prepared March 18, 2010. For more detailed information on the Delaware Nutrient Balance index, contact Dr. Sims [jtims@udel.edu](mailto:jtims@udel.edu).*

### A Nutrient Balance Index for the State of Delaware

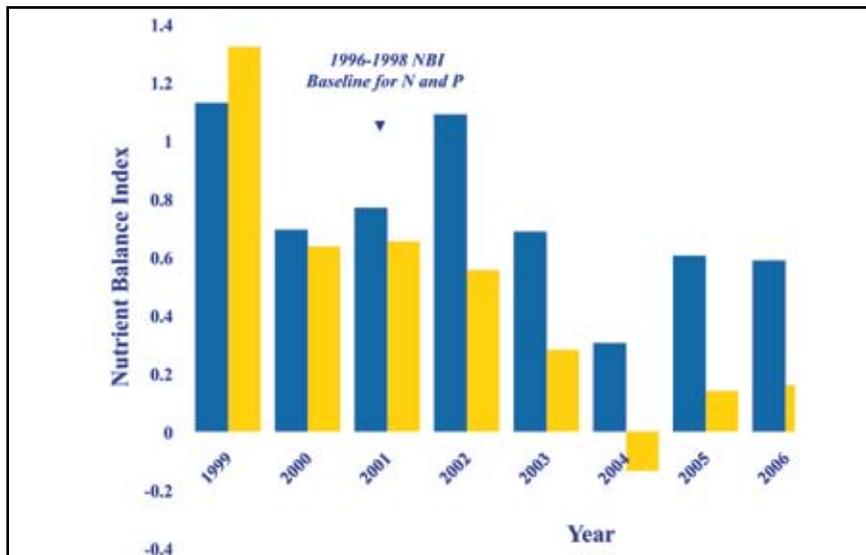
Nutrient mass balances are used worldwide to guide strategic nutrient management planning efforts for farms, watersheds, states, regions, and countries. In brief, a mass balance analysis compares nutrient inputs (fertilizers, manures, etc.) to a defined geographic area with nutrient outputs (crop harvest, 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 Commission.

As part of this project, we 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 statewide N and P surpluses in 1996-1998 (the three years immediately prior to the 1999 Delaware Nutrient Management Act) as the difference between [fertilizer and manure N and P produced or sold and biological N fixation] 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 has been 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 measure statewide progress in nutrient management. This article summarizes trends in the Delaware NBI from 1999, when the Delaware Nutrient Management Act was passed, until 2008.

**Phosphorus (P):** Marked progress has been made in reducing P surpluses in Delaware and these changes now appear to be becoming a permanent part of our agricultural systems. In 1996-1998, statewide P surpluses were estimated to be ~ 40 lbs P<sub>2</sub>O<sub>5</sub>/

acre/year. In 2008, Delaware agriculture was basically in balance with respect to P, a remarkable accomplishment in such a short time (Fig. 1). Major factors contributing to this nutrient management success story include the advent of new feeding strategies by the poultry industry (e.g., phytase-based diets), nutrient management plans that have resulted in more efficient use of P fertilizers, and the Commission's manure relocation program. Note that the increase in the NBI for P in 2007 was primarily due to drought conditions that seriously reduced crop P uptake. There are still nutrient management concerns with respect to high P soils in Delaware but the reduction in statewide P surpluses is a very positive step in terms of increasing farm profitability and protecting water quality.

**Nitrogen (N):** Relative to 1996-1998, when the average statewide nitrogen surplus was estimated to be ~80 lbs. N/acre/year, there has been a general trend for improved N balance in Delaware although not as striking as with P. Average N surpluses for 2000-2008 decreased from 80 to 52 lbs N/acre/year (excluding 2002 and 2007, drought years where crop N uptake was markedly lower) and the average NBI was 0.65, indicative of a ~35% improvement in statewide N balance. The situation for N is more complex because N surpluses are heavily influenced by annual weather conditions. For example, the Delaware NBI value for N was 0.9 in 2007, a drought year, 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 are now under way to increase the amount of irrigated crop land, improve irrigation efficiency, and develop drought-resistant crops. This should help to minimize 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. Causes for the relatively high NBI value for N in 2008 (0.9) are not clear as this was a reasonable year in terms of weather and crop yields were near or above long-term averages. There was a significant increase in fertilizer tonnage reported by the DDA in 2008, compared to 2003-2007, which would lead to an increased NBI for N. Efforts to manage N efficiently, including decreasing N surpluses, clearly must remain an ongoing and important part of Delaware's nutrient management planning efforts.



# 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 ( $P_2O_5$ ) per ton (Hansen, 2005). Analysis prior to 2001 was commonly seen at 60-70 lbs.  $P_2O_5$  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.

## Evaluating Excess Poultry Litter-Manure in Delaware

### *Poultry Litter/Manure Generation*

Delaware growers produced 245.8 million broilers/roaster chickens in 2007 according to the Delaware Agricultural Statistics for 2007-2008. An industry-adopted litter-manure generation calculation is to multiply 1.25 tons per 1,000 birds. 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 307,250 tons annually.

This annual generation does not necessarily indicate the amount available for disposition. The annual disposition is dependent on cleanout cycles such as three-year total cleanouts, annual cleanouts, center cleanouts and crust-outs. Other variables that influence disposition include the availability of bedding litter and disease pressure. It should be acknowledged that if disposition for one particular year is below average, there will be another year in which disposition is above average. It will be assumed that the generation is equal to the amount available for disposition.

### *Nutrient Value*

The current nutrient value of poultry litter-manure is 57-44-45 pounds per ton of Total Nitrogen (TN), Phosphate ( $P_2O_5$ ) and Potash ( $K_2O$ ). Pounds per ton are illustrated as (TN- $P_2O_5$ - $K_2O$ ). The nutrient values of interest are nitrogen and phosphate and are utilized in evaluating the N and P balance for Delaware crop production.

### *Nitrogen and Phosphorus Mass Balancing*

The fundamental tenet of economically and environmentally sound nutrient management is the strategic approach of nutrient mass balancing. Dr. Tom Sims and colleagues published a mass balance report in 2008 titled Nutrient Mass Balances for the State of Delaware. 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.

Excess poultry litter-manure currently supplies several alternative use markets. Most of the excess poultry litter-manure originates from Sussex County. The primary market drivers for excess poultry litter-manure are:

1. Phosphorus-limited nutrient management regulations;
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.

### *Excess Poultry Litter Evaluations*

The assessment of excess poultry litter-manure was conducted using three different methods:

1. Marketplace: The marketplace method was simply evaluating the amount of excess poultry litter-manure moving to alternative markets. These markets include land application on fields that have soil phosphorus levels less than 150 fertility index value within Delaware, relocation for land application outside of Delaware, Perdue AgriRecycle pelletizing plant and the mushroom industry located in southeast Pennsylvania. The three-year average for excess poultry litter entering the marketplace is 96,436 tons.
2. 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. According to the mass balance report, the phosphorus input in the form of poultry litter-manure 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 (Sims, 2008). This surplus along with the 2006 relocation projects result in a total gross surplus tonnage of 118,257.
3. Agronomic recommendations for economically optimum yields: This method accounts for the agronomic demand of the plant and accounts for the presence of phosphorus stored in the soil. This method assumes that adequate phosphorus soil levels will result in no application of phosphorus in the form of poultry litter-manure or commercial fertilizer. This agronomic threshold method calls for application rates that are recommended by the University of Delaware and balanced between crop uptake and nutrient inputs. According to the mass balance report, the agronomic assessment accounts for 66% of the excess phosphorus (3,490 tons), which is 2,303 tons (Sims, 2008). When converted to a poultry litter-manure value, it represents 239,721 tons of litter-manure still surplus, or 78% of all litter-manure generated in one year.

In conclusion, methods #1 and #2 appear to be the realistic methods for determining excess poultry litter-manure. The average between method #1 and method #2 is 107,346 tons and should be used for planning purposes:

—Bill Rohrer 9/29/09

### ***Delaware Poultry Litter/Manure and Mass Balance Data***

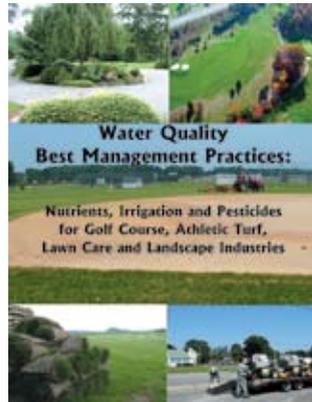
2007 statewide poultry production	245,800,000 birds
2007 litter/manure generation	307,250 tons
Method #1: Marketplace excess poultry litter/manure (07,08,09 average)	96,436 tons
Method #2: Mass balance report for implementing the NM law	118,257 tons
Method #3: Mass balance report for agronomic P demand	239,721 tons
<b>Recommended planning figure for excess poultry litter/manure</b>	<b>107,346 tons</b>

## **Best Management Practices**

The Delaware Nutrient Management Program has two 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

### ***Golf Courses, Athletic Turf, Lawn Care and Landscape Industries***

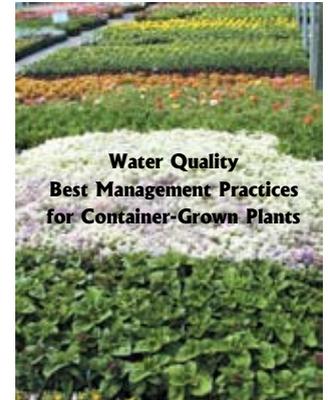
The Commission recommends BMPs for non-agricultural businesses such as golf courses and lawn care companies. The BMP booklet consists of six chapters that include: Introduction; Nutrient Management Certification; Nutrient Management BMPs; Fertilizer; Irrigation & Fertigation Management; and Pesticide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



booklets are valuable training tools for nutrient handlers and are often found as a component of the nutrient management plan. For more information or to obtain a copy of these informative booklets contact the Nutrient Management Program at 302-698-4500.

### ***Container and Nursery Industries***

The Commission recommends this BMP booklet for the greenhouse and nursery industries. The booklet contains four 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.



## ***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 2010 summary of the Districts' accomplishments:

#### **NEW CASTLE COUNTY**

##### **Construction/Planting Contracts**

- Manure storage – 2
- Cover crop – 4,837 acres
- Roof runoff structures – 1
- Stream fencing – 1,500 ft (6929 total fencing)

##### **In-House Accomplishments**

- CNMPs planned — 3 on 32.9 acres/ CNMPs applied — 1 on 237 acres
- Conservation Plan development – 127 “planned” totaling 16,759 acres with 113 “applied” totaling 12,716 acres

#### **KENT COUNTY**

##### **Construction/Planting Contracts**

- Manure storage – 1
- Mortality storage – 0
- Cover crop (planted) – 12,058 acres
- Concrete pads for manure handling – 8

##### **In-House Accomplishments**

- Nutrient Management Plan development – 8 plans representing 1,750 acres
- Animal Waste Plan/CNMP development – 10
- Conservation plan development – 20,500 acres
- Pre-side dress soil nitrate test – 180 tests representing 7,820 acres

#### **SUSSEX COUNTY**

##### **Construction/Planting Contracts**

- Manure storage – 0
- Mortality storage – 0
- Cover crop – 35,724 acres
- Concrete pads for manure handling – 0

##### **In-House Accomplishments**

- Nutrient Management Plan development – 27 plans representing 4,666 acres
- Animal Waste Plan / CNMP development – 93
- Conservation plan development – 297 representing 41,041 acres

## ***Field Staging of Poultry Litter-Manure***

The following standards reference temporary staging of poultry litter for all poultry operations and anyone handling poultry litter-manure. During 2010, the standards listed below were in the form of recommendations. As of January 2011, these will become enforceable regulations.

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 before use and must be conducted according to the Commission standards. In situations where temporary field staging 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 staging is the least preferred storage practice but may be conducted according to the standards on the following page:

## Temporary Field Staging of Poultry Litter Standards

### Production Area Storage

“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.

Stockpiling storage within the “Production Area” (as defined above) is limited to 14 days without the use of an impervious cover.

The following BMP(s) are required for Production Area Storage:

1. The stockpile must be separated from any channeled runoff, standing water and other drainage systems such as roof runoff and down spouts.

The following additional BMPs are required for Production Area Storage of 2-14 days:

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 Commission.

### Application Area Storage Up To 90 Days

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.

“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.

The following BMPs are required for Application Area Storage Up to 90 days:

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 Commission; and
4. The temporary field 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 hundred 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 one of the following practices must be implemented:
  - a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the Commission; 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.

### Application Area Storage Over 90 Days

This additional outdoor staging time can only be used if the farmer has a written waiver from the Delaware Nutrient Management Commission.

For conditions that require temporary storage of litter-manure beyond 90 days, individual or general authorization may be granted by the Commission or Delaware Department of Agriculture.

The following BMPs are required for Application Area Storage Over 90 days:

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 Commission; 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 hundred 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 one of the following practices must be implemented:
  - a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the Commission; 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.



**Research into ag-bags is ongoing regarding field staging of manure.**

## *Handling Catastrophic Mortality*

Every animal operation’s nutrient management plan is designed to address daily and catastrophic mortalities. Most daily mortalities are handled in environmentally friendly manners such as composting. Most farms are not designed to handle large scale mortality events such as what Delaware experienced during the winter of ’09/’10. Many farmers faced the challenge of handling large amounts of mortalities from roof collapses caused by snow accumulation. The following recommendations were provided to the poultry industries and growers as they dealt with catastrophic mortalities. Compost all mortalities onsite in:

1. A covered structure such as a manure shed. It is important that the proper amount of carbon is used in order to rapidly heat the pile and promote the breakdown of the birds. In general the mortality to carbon ratio is one to one. Acceptable carbon sources are straw, woodchips or shavings.
2. Relocate the mortalities to a commercial composting site.
3. Relocate the mortalities to a landfill. This option requires coordination and approval with the landfill.

## Budget

The Nutrient Management Commission’s accomplishments were made possible by 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 Budget
Program Operating Costs:			
Personnel	257,000	251,600	130,000
<b>Federal Funds Section 319 (Clean Water Act)*</b>	<b>30,000</b>	<b>30,000</b>	<b>30,000</b>
Travel	5,500	5,500	600
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
<b>Federal Funds NRCS*</b>	<b>90,000</b>	<b>0</b>	<b>50,000</b>
<b>Federal Funds section 319 (Clean Water Act)*</b>	<b>200,000</b>	<b>200,000</b>	<b>200,000</b>
<b>Federal Funds Ches. Bay Program*</b>	<b>110,000</b>	<b>110,000</b>	<b>150,000</b>
<b>Poultry Companies*</b>	<b>53,863</b>	<b>125,499</b>	<b>200,000</b>
Nutrient Management Planning	451,800	0	411,800
Nutrient Management Planning from Pesticide Revenues	0	451,800	0
Demonstration and Research	1,505	0	0
Penalties Collected	1,050	1,906	1,906
<b>TOTAL</b>	<b>1,656,618</b>	<b>1,664,305</b>	<b>1,608,717</b>

\* 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.

### *What are the Commission’s Responsibilities?*

The Delaware Nutrient Management Commission will:

1. Consider establishing critical areas for voluntary and regulatory programs.
2. Establish Best Management Practices to reduce nutrients in the environment.
3. Develop educational and awareness programs.
4. Consider incentive programs to redistribute excess nutrients.
5. Establish the elements and general direction of the State Nutrient Management Program.
6. Develop nutrient management regulations.

### *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. He is a full-time Sussex County dairy producer who 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.



**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 Swine Producers. He can be reached at (302) 732-3007.



**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.



**Robert Baldwin**, is the Agricultural Liaison for the Department of Natural Resources and Environmental Control and 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. Kenny 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. He is a waste water treatment employee for Kent County and represents equine farming operations. He can be reached at (302) 422-4094



**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.

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



**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 (work) or (302) 684-3196 (home).

**Larry Lee** was appointed by the House of Representatives. He was appointed to represent commercial applicators in Delaware. Larry is employed with FS Growmark in Milford. He can be reached at (302) 424-2835.



**Bud O'Neill** was appointed by the Governor as a representative for 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 and 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 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.

**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.



**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.

**Dr. Gerald Llewellyn** serves for Secretary Rita Landgraff and is currently 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 and he can be reached at (302) 744-4824.



**David Small** Deputy 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.

### *Delaware Nutrient Management Program Staff*

W. Larry Towle is the Program Administrator of the Delaware Nutrient Management Program and an ex-officio member of the Nutrient Management Commission. He can be reached at (302) 698-4500 or [larry.towle@state.de.us](mailto:larry.towle@state.de.us).



**Bob Coleman** the Nutrient Management Coordinator for the Delaware Nutrient Management Program. He can be reached at (302) 698-4556 or [robert.coleman@state.de.us](mailto:robert.coleman@state.de.us).

**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](mailto:judy.baines@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 with the University of Delaware. 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.



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

**Phillip Sylvester**, Kent County Extension Office at (302) 730-4000.

**Shawn Tingle**, Extension Associate, at (302) 856-2585, Ext. 572.

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

**Sydney Young Riggi**, Extension Associate, at (302) 856-2585, Ext. 571.

### *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, are 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](http://www.state.de.us/deptagri/nutrients/index.shtml), or call (302) 698-4500; fax (302) 697-4768.

*“Water Quality is Everyone’s Responsibility”*