



Delaware Nutrient Management Commission

April 1, 2007



Nutrient Management Law Generates Results

Delaware farmers, golf courses and other nutrient handlers continue to generate results. There has been tremendous nutrient management success due to increased awareness, education, and usage of Best Management Practices throughout the State. This progress must continue, as water quality monitoring indicates the need for more improvement from all sources contributing to nutrient runoff.

The results illustrated in this Annual Report demonstrate that nutrient handlers are making progress to reduce nutrient runoff. Animal feeding operations, row crop farmers, horse operations, golf courses and lawn care companies are implementing nutrient management practices and demonstrating accountability.

This report represents 2006 activities and progress in implementing the 1999 Nutrient Management Law (3 Del. C. §2200 et. al.).

The Delaware Nutrient Management Commission continues its efforts to improve the quality of Delaware's waters, while balancing the state's valuable agricultural industries. It has met the nutrient management deadlines established by 1999 legis-

lation. January 2007 marked the final of five legal deadlines that will affect all Delaware farmers, golf courses and other nutrient handlers. All nutrient handlers had a certification deadline of January, 2003 that resulted in 1,955 certifications. The law required 20% increments for implementing mandatory nutrient management standards that started in 2003. Full implementation was mandated January 1, 2007. To date, 99%, or 453,291 acres of Delaware cropland have been enrolled or mandated into program requirements. Planning is only the first step. Implementation occurred with the relocation of 77,724 tons of poultry litter-manure along with many other measurable results.

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.



Nutrient Management is a priority for many farmers across the state. Many farmers open their farms to discuss nutrient management, such as this Hartly farm.

Table of Contents

	Page #
Nutrient Management Law Generates Results	1
Nutrient Management Training, Education and Certification ...	2
Nutrient Management Planning.....	2
Mandate Phase-In Update.....	3
Planning and Implementation Costs	3
Nutrient Management Plan Audits	3
Nutrient Management Financial Audits.....	3
Nutrient Management Relocation.....	4
Nutrient Management Critical Areas	6
Nutrient Management Research and Demonstration.....	7
Best Management Practices.....	7
Stockpiling & Temporary Field Storage of Poultry Litter-Manure.....	7
BMP Booklets.....	9
County Conservation Districts	9
Continued Agreement with Poultry Companies	10
Permits for Certain Animal Operations	11
Phosphorus Management and Phytase	11
Complaint Resolution.....	11
Delaware Environmental Stewardship Program.....	12
Budget.....	13
References	13
Background and Contacts.....	13
Members of the Nutrient Management Commission	14
Delaware Nutrient Management Program Staff	15
University of Delaware Staff.....	16

Nutrient Management Training, Education and Certification

The Commission continues to view education as a priority for many nutrient management topics. As farmers and other nutrient handlers become certified and continue the educational requirements, increased accountability is demonstrated. The Commission has issued 1,955 certifications as outlined below, (and they can be individually viewed on the Program's website. See contact information):

1. 532 Nutrient Generator certifications valid for three years;
2. 1,270 Private Nutrient Handler certifications valid for three years;
3. 54 Commercial Nutrient Handler certifications valid for one year;
4. 99 Nutrient Consultant certifications valid for one year.

The Commission continues to offer and coordinate certification classes as required by law, for all levels of certification. The University of Delaware Cooperative Extension conducts most of these classes. Classes are offered for the initial certification as well as continuing education requirements.



During 2006, 60 Continuing Education classes were held at 28 different locations, such as this one in Harrington.

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 five examinations for commercial nutrient handlers were offered in 2006, resulting in 16 (57%) passing scores and 12 (43%) failing scores. Nutrient consultant test questions were 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. The test sessions are also coordinated with the National CCA program to expand the opportunities for crop consultants.

All certifications, except Nutrient Consultants, are valid over a three-year period. Nearly one third of the expirations will occur May 1, 2007. During 2006, 60 continuing education classes were offered at 28 different locations. These classes were organized by the following associations:

1. University Cooperative Extension: 39 meetings with 1,603 individuals receiving credit;
2. Private agri-service companies such as crop consultant meetings and farm meetings: 13 meetings with 103 individuals receiving credit;
3. Others: 13 meetings with 265 individuals receiving credit.

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 will be pro-rated in one-quarter credit increments. Credits are approved by providing the meeting or class agenda to the University of Delaware Research and Education Center or the State Nutrient Management Program prior to the event.

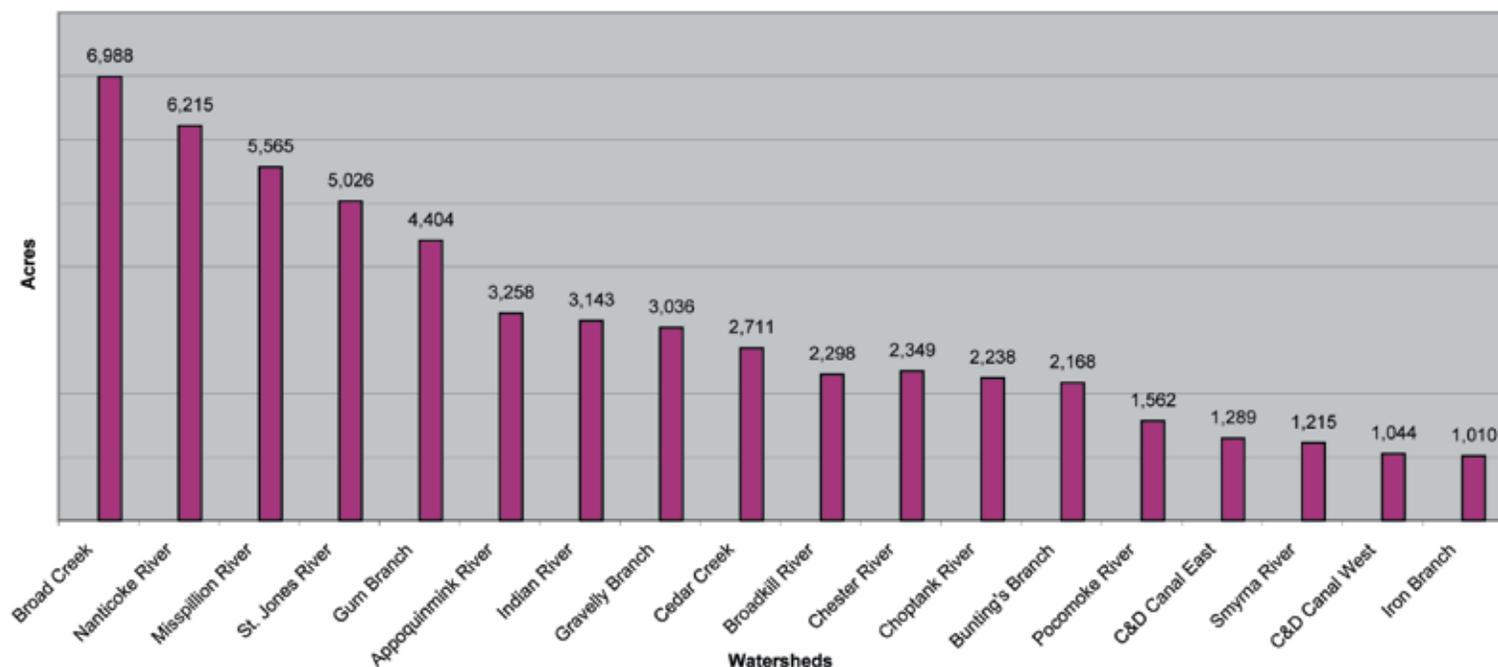
Nutrient Management Planning

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 maps, soil analysis, manure analysis, crop yield goals and a budget for nutrients.

The Commission depends on private and public nutrient consultants

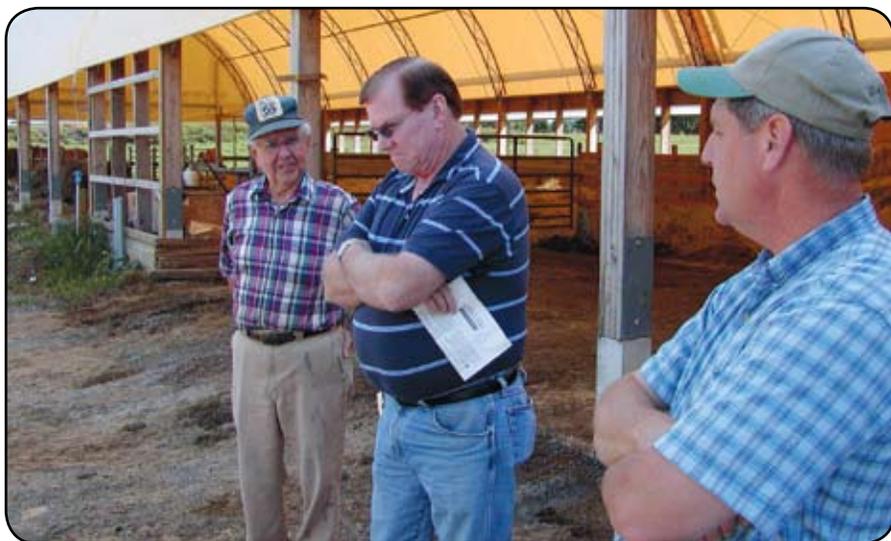
to develop nutrient management plans. In 2006, 127 farms and 1 golf course representing 82,053 acres were reimbursed at a capped rate for a plan developed by a private consultant. Kent and Sussex Conservation Districts assisted 63 farms representing 15,596 acres in the development of nutrient management plans. Also, 68 farms were assisted with an animal waste management plan. During 2006, a total of 97,649 acres were covered by nutrient management plans.

Delaware Watersheds With at Least 1000 Acres in NM Planning 2006



Mandate Phase-In Update

The Nutrient Management Law required the Commission to phase in the Nutrient Management 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 (99%) of crop land being brought into compliance with Commission standards.



Farmers continue to work with Nutrient Consultants, resulting in 453,291 acres, or 99% of Delaware cropland under nutrient management. Consultants are employed by crop consulting firms, fertilizer businesses, University of Delaware, Conservation Districts, and the Natural Resources Conservation Service.

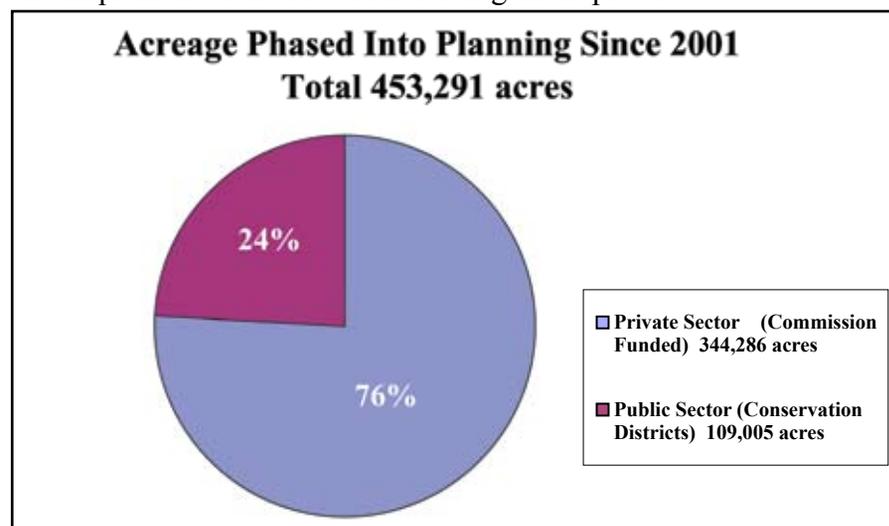
Planning and Implementation Costs

Funds for the implementation of nutrient management planning are provided by State and Federal sources. During 2006, the Commission expended \$391,031 for the reimbursement of costs associated with the development of nutrient management plans by private consultants. The Natural Resources Conservation Service (NRCS) obligated \$216,750 in FY 2006 for expanded nutrient management planning practices such as GPS-precision nutrient management. In addition, the Department of Natural Resources and Environmental Control (DNREC) provided \$285,320 (NPS Annual Report, 2005) of Section 319 Clean Water Act funds to cover the cost of seven conservation and nutrient management planners employed by Kent and Sussex Conservation District offices. The University of Delaware Cooperative Extension also provides assistance to farmers in developing nutrient management plans.

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 procedures. Expenditures for such practices include:

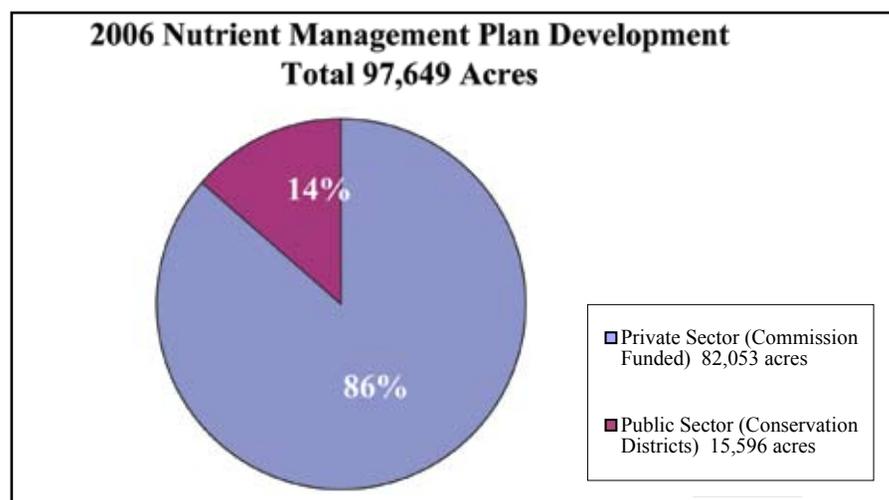
1. \$2,896,310 in Federal funds (Farm Bill) from Natural Resource Conservation Services (NRCS) for manure structures and Best Management Practices such as manure and mortality management, heavy use protection, cover crops, windbreaks and other Best Management Practices;
2. \$2,084,274 in DNREC funds for manure structures, mortality management and cover crops;
3. \$523,344 in State funds from the Commission for poultry litter-manure relocation.

In summary, the above agencies contributed \$5,503,928 to the planning and implementation of Nutrient Management practices.



Nutrient Management Plan Audits

Each year the program staff audits 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 goal of the nutrient management law and regulations. During 2006, program staff audited the nutrient management plans of ten agricultural operations and five non-agricultural operations. In addition, nutrient management audits were also performed at each of the eight Concentrated Animal Feeding Operations located in the state, for a total of 22 compliance audits.



Nutrient Management Financial Audits

Over 65% of the program budget goes towards relocating excess poultry litter-manure and developing nutrient management plans by the private sector. Financial audits are conducted by staff to ensure proper accountability and integrity of public funds. Five financial audits were conducted to check recordkeeping and generally accepted business practices. The relocation audits focus on proper accounting practices and are conducted annually.



Manure generation computations are an essential component of a Nutrient Management plan.

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 have surfaced over the past few years to help manage excess litter-manure. The Relocation Program is one of several effective solutions to excess litter-manure generated in Delaware.

Alternative use projects are also essential for managing excess poultry litter-manure. In 2006, 77,724 tons of excess poultry litter-manure were relocated, with a six-year total of nearly 400,000 tons. Over 50% of the excess litter-manure goes to alternative use projects such as the Perdue AgriRecycle fertilizer plant in Blades, DE. The plant processed a total of 57,200 tons in 2006, 32,400 tons being Delaware-generated.



2006 resulted in the relocation of 77,724 tons of poultry litter-manure. Trucks are uploaded and exported from a farm in Delaware.

The Relocation Program provides financial reimbursement to farmers, brokers and trucking businesses for the transportation costs 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.

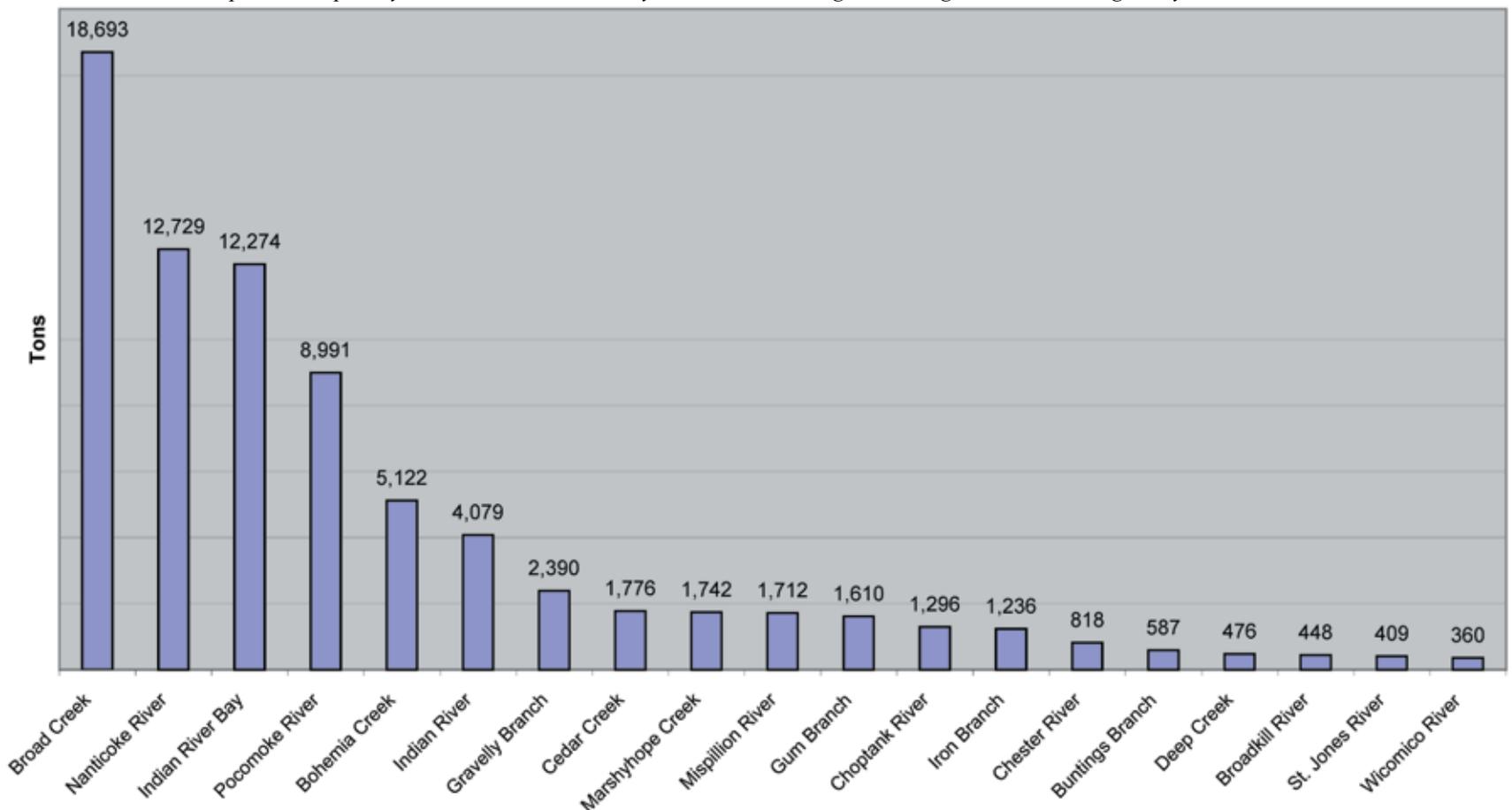
Farmers and others wishing to participate in relocation projects can register with the nutrient management matching service by contacting (302) 698-4500. The Relocation Program provides farmers with the option to move the litter-manure themselves or hire a broker to relocate it.



Poultry litter-manure is taken from the house to a tractor trailer for relocation.

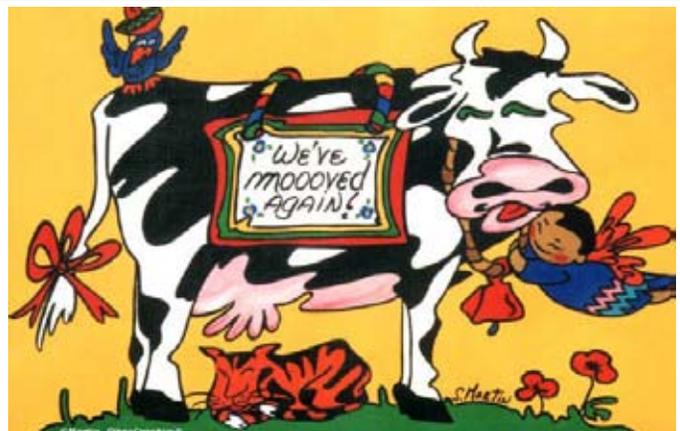
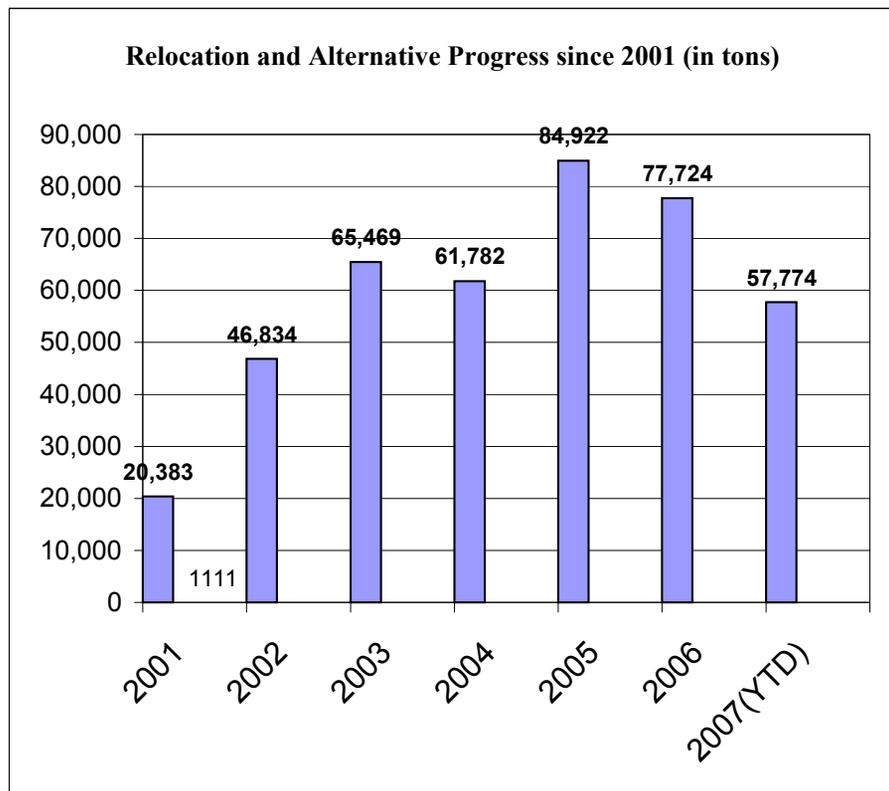
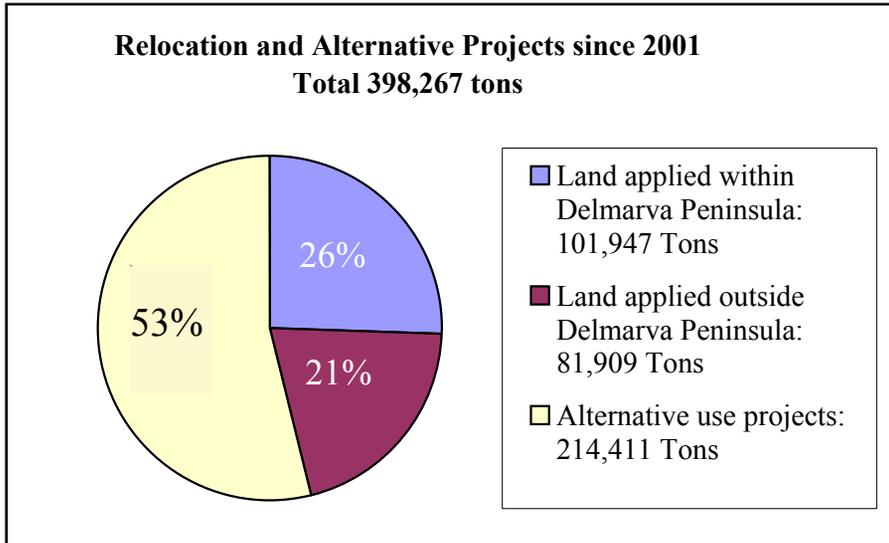
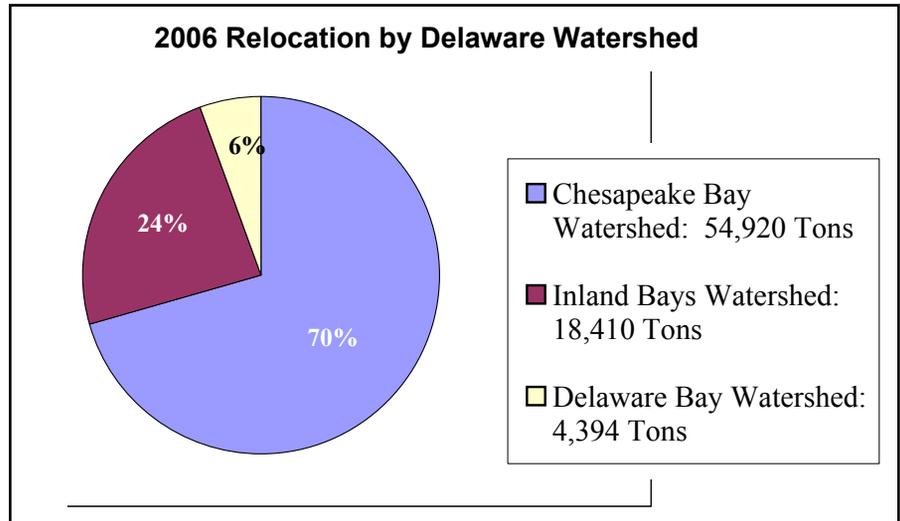
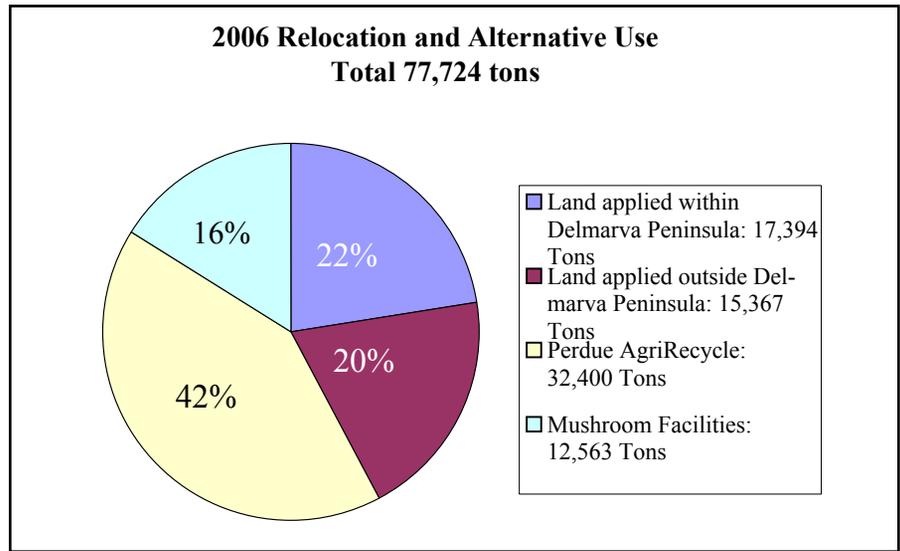
TONS RELOCATED BY WATERSHED

Tons represent all poultry manure-litter relocated by the Nutrient Management Program and Perdue AgriRecycle





Perdue AgriRecycle continues to serve as an important alternative use facility for excess poultry litter-manure. During 2006, Perdue AgriRecycle used excess poultry litter-manure to process and sell 57,200 tons of fertilizer. 32,400 tons originated from Delaware poultry farmers.



Have YOU relocated or do you have a new 911 address? Help us update our records.

Send name and new address to: Delaware Nutrient Management Program, 2320 South Dupont Highway, Dover, DE 19901

Name _____

Firm/farm name _____

Address _____

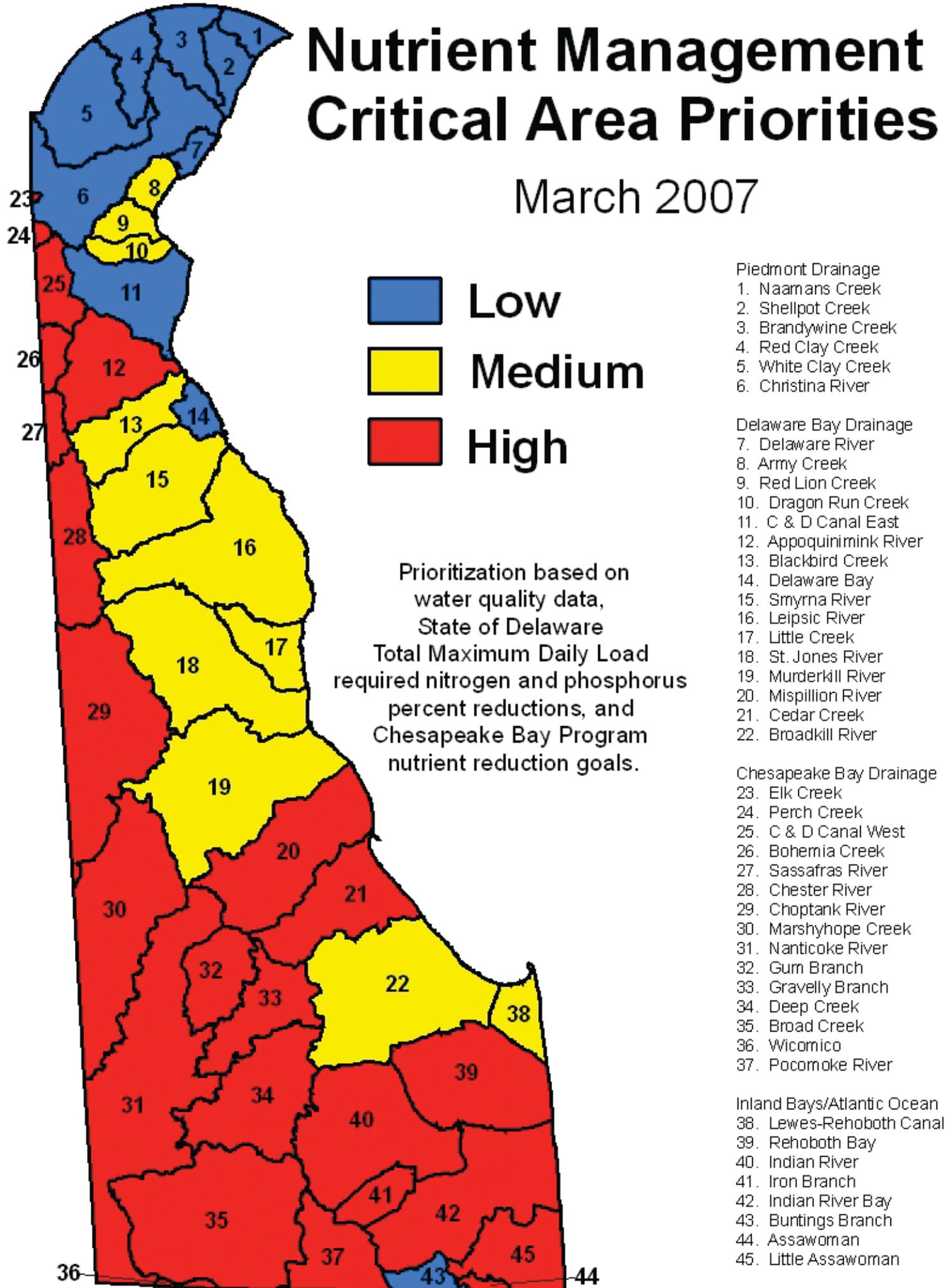
City _____ State _____ Zip _____

Telephone _____

Nutrient Management Critical Areas

The Commission recently updated the “Critical Areas” map to help set priorities for the Nutrient Management Program. The Department of Natural Resources and Environmental Control

provided recommendations based on water quality testing for Nitrogen and Phosphorus.



Nutrient Management Research and Demonstration

Research and demonstration projects are vital in the effort to link science with policy development. Demonstration projects validate proven science in farm fields throughout Delaware and provide balanced feedback for policy implementation.

During 2006, the Commission funded four research and demonstration projects. Scientists from Delaware State University undertook two of these projects, while staff from the University of Delaware conducted the other two. These projects follow with a brief update:

1. Effective Setbacks for Controlling Nutrient Runoff Losses from Land-Applied Poultry Litter-manure; Delaware State University. \$45,265 was dedicated to measuring the effectiveness of poultry



The Commission continues to fund research projects such as this outdoor poultry litter-manure project managed by the University of Delaware.

litter-manure application setbacks. A 100-foot setback, winter cover crop, and litter-manure/soil incorporation practices will be evaluated over the course of two growing seasons for nutrient runoff. A scientific paper outlining the results of this study will be presented to the Commission during the winter of 2008.

2. Utilization of Poultry Litter-Manure as Activated Carbon Sources; Delaware State University. \$23,748 has been allocated to explore optimal carbonization and activation conditions for converting Delaware poultry litter-manure to activated carbon. This research occurred during the summer and fall of 2006. Activated carbon is a common and powerful adsorbent used to filter impurities from liquid and gas waste streams. This project is an exploration of further alternative uses for litter-manure. A scientific paper with the results of this research will be presented to the Commission in the spring of 2007.
3. Managing Temporary Storage of Poultry Litter-Manure in Delaware; University of Delaware. \$35,789 has been allocated to examine production size poultry litter-manure piles and associated Best Management Practices for minimizing nutrient losses during temporary outdoor storage. Sampling has been completed and lab analysis will be completed in March of 2007. Results of the research project will be available during 2007.
4. Advancing Nutrient Management in Delaware: Accurate Nutrient Budgets and Prioritized Best Management Practices; University of Delaware. \$28,122 has been allocated to establish an accurate, up-to-date nutrient balance for Delaware. This nutrient balance will account for practices such as Phytase use in poultry feed, the Perdue AgriRecycle plant, the Nutrient Relocation Program and other factors. Additionally, a farm-scale nutrient balance software program will be developed along with a systemic Best Management Practice rating scale for measuring the effectiveness of nutrient reduction. The results of this study will be presented to the Commission in March 2007.

Best Management Practices

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 it 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 litter-manure before use and must be conducted according to 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:



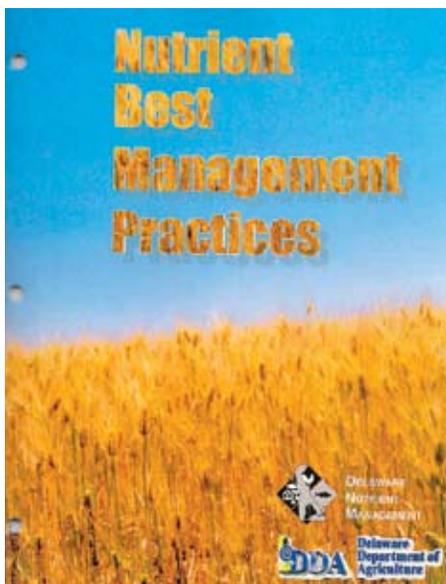
Poultry litter-manure is a valuable resource when stored, handled, and applied properly.

Stockpiling and Temporary Field Storage of Poultry Litter-Manure 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>For conditions that require temporary storage of litter 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.</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 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 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 Non-Production 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.

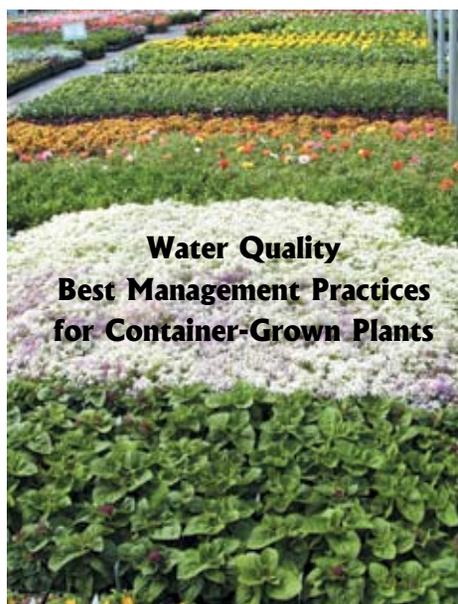
BMP Booklets

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. The 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.



Agriculture Industry

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.

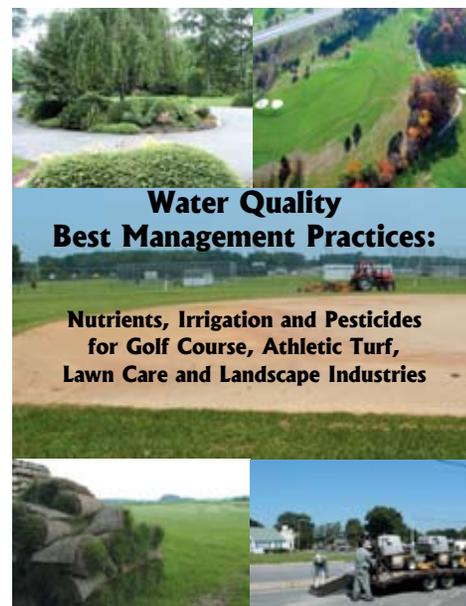


Golf Courses, Athletic Turf, Lawn Care and Landscape Industries

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.



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 2006 summary of the Districts' accomplishments:

NEW CASTLE COUNTY

Construction/Planting Contracts

- Manure storage – 9
- Cover crop – 2,492 acres

In-House Accomplishments

- Animal Waste Plan Development – 8
- Conservation plan development – 30,900 acres
- Pre-side dress soil nitrate test – 86 representing 6,357 acres
- Phosphorus site index evaluation – 8

KENT COUNTY

Construction/Planting Contracts

- Manure storage – 12
- Mortality storage – 5
- Cover crop – 13,721 acres
- Concrete pads for manure handling – 34

In-House Accomplishments

- Nutrient Management Plan development – 31 plans representing 7,430 acres
- Animal Waste Plan development – 38
- Conservation plan development – 30,586 acres
- Pre-side dress soil nitrate test – 203 representing 8,438 acres
- Phosphorus site index evaluation – 64

SUSSEX COUNTY

Construction/Planting Contracts

- Manure storage – 13
- Mortality storage – 13
- Cover crop – 25,241 acres
- Concrete pads for manure handling – 48

In-House Accomplishments

- Nutrient Management Plan development – 32 plans representing 8,166 acres
- Animal Waste Plan development – 22
- Conservation plan development – 31,875 acres
- Pre-side dress soil nitrate test – 151 representing 7,512 acres
- Phosphorus site index evaluation – 23



Poultry litter-manure sheds can be built with some financial assistance by contacting your Conservation District Office.

Continued Agreement with Poultry Companies

The Nutrient Management Commission continues to implement the nutrient management agreement outlined in the 2001 Memorandum of Understanding. This document was signed by the chief executives of all poultry companies operating in Delaware, Delaware Department of Agriculture, and DNREC. The document expands on the legal requirements to submit an annual report to the Commission outlining the accomplishments and strategy for nutrient management. 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 via 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. 11,026 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. Partnered with the Center for Inland Bays to implement the Poultry Integrator Nutrient Effort (PINE) project;
4. Volunteered all company owned farms for the On-Farm Assessment and Environmental Review (OFAER) audit and recommended such to all contract growers. The OFAER was managed by the American Clean Water Foundation and was recently discontinued;
5. Enrolled 814 acres of company owned property into water improvement conservation programs.



Mountaire's Corporate Environmental Manager, Jeffrey Smith, 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 of five water quality and air quality research projects.



Perdue's Regional Environmental Manager, Jim Parsons, 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 7,241 ton reduction in inorganic Phosphorus addition to feed resulting from phytase use;
5. Funded and participated in nutrient management related research projects valued at \$352,000.



A poultry operation in Sussex County, Delaware.



The poultry company agreement involves contact growers and company strategies to reduce nutrient runoff from poultry production.

Permits for Certain Animal 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).

The Nutrient Management Law and a formal agreement provide authority for the Nutrient Management Program to implement regulations for CAFOs. The stated agreement is a memorandum between DNREC and DDA with input from the Commission and the EPA. 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.

A CAFO permit is required when a farm experiences 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 that prohibit a discharge. A copy of the nutrient management plan must accompany the NOI. In general, a discharge occurs when animal manure is improperly stored, handled incorrectly, or over-applied as defined by the nutrient management plan. Animal operations may also voluntarily sign an NOI (as many have) for the added legal protection that such a permit affords a business.

During 2006, the following animal feeding operations were managed under a CAFO permit:

CAFO NAME	ANIMAL TYPE	CAPACITY	LOCATION
Delaware Egg Farm	Laying Chickens	1,143,768	Middletown
Delaware Park	Horses	1,500	Wilmington
East. Shore Chick.	Broiler Chickens	635,000	Frankford
Raghunandan Farm	Broiler Chickens	217,000	Millsboro
Schiff Farms Inc.	Feeder Beef	4,000	Whitleysburg
Slabaugh Farm	Broiler Chickens	89,000	Delmar
Szewczyk Farm	Broiler Chickens	43,000	Delmar
Woikoski Farm	Broiler Chickens	191,000	Felton

Any farm that operates under a CAFO permit is subject to an annual inspection and must prevent any discharge to the environment under weather conditions less severe than a 25-year rain event, or about 6.3

inches of rain within a 24-hour period. The permit requires a nutrient management plan, records of implementation, annual report, certification and other practices.

Phosphorus Management and Phytase

Managing Phosphorus is required in the Nutrient Management Law by restricting Phosphorus applications to the crop removal rate. Phosphorus-based manure applications can be managed and applied as 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 supple-

mental 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 use of phytase is one of several strategies needed to meet the intent of the Delaware Nutrient Management Law.

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.

The Nutrient Management Program investigated and the Commission acted on one alleged violation.

Thirty-seven 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	54%
Manure Odor	22%
Miscellaneous	19%
Nutrient Management Certification	5%
Operation Type	
Poultry	62%
Horse	11%
Field Crop Only	11%
Dairy	11%
Swine	3%
Beef	2%

Delaware Environmental Stewardship Program

The Commission partnered with three poultry companies to select and recognize the 2006 environmental stewards. Allen Family Foods, Inc., Mountaire Farms, Inc. and Perdue Farms, Inc. funded the stewardship program.

The Environmental Stewardship program 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 2006 Delaware Environmental Stewardship Award was granted to three farms during the 13th Annual Governor's Conference on Agriculture. Guy and Nancy Phillips of Georgetown were presented with the top award and received a cash award of \$2,500, a lane sign (see photo) and a plaque.

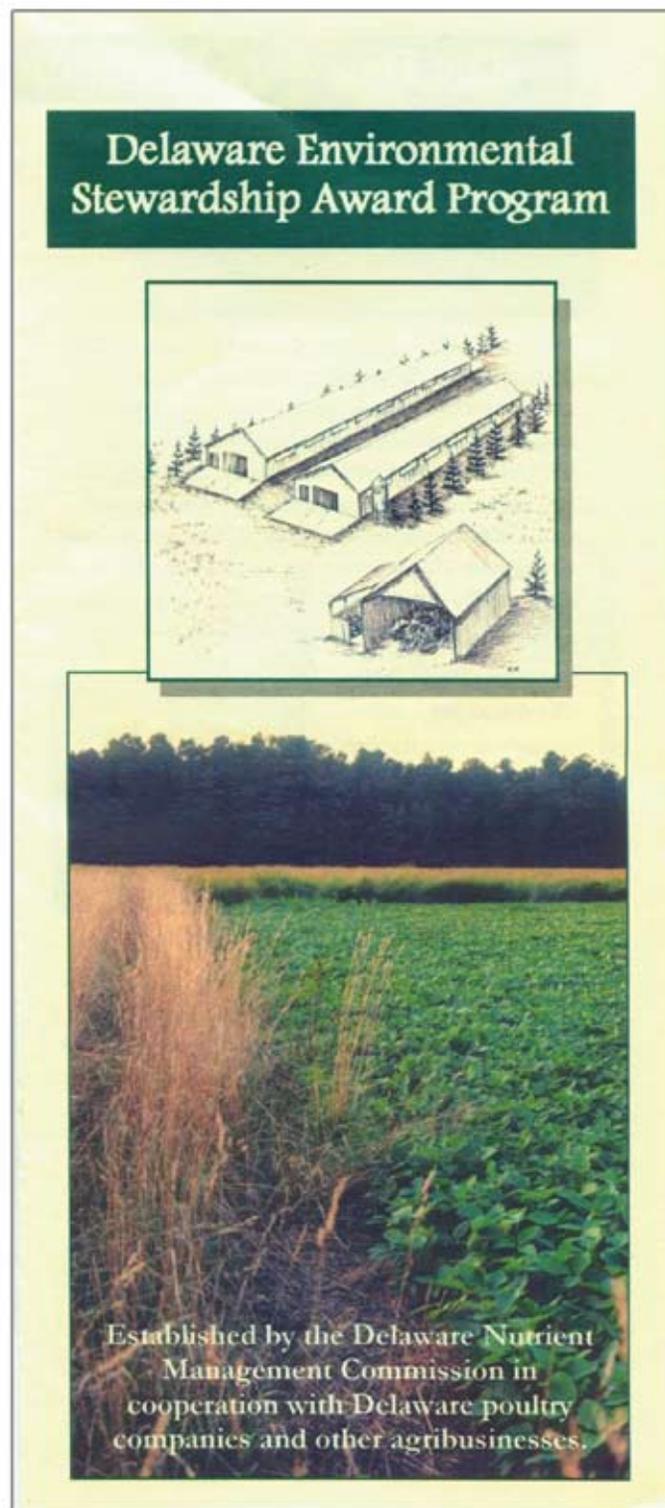
Richard and Joyce Morris of Laurel, Delaware, and Samuel Slabaugh of Delmar were also each awarded with a cash award of \$250, a lane sign and a plaque.



Left to right: Guy Phillips, 2006 Delaware Environmental Steward, Bill Rohrer, DDA Nutrient Management Program Administrator; Nancy Phillips, 2006 Delaware Environmental Steward; Tom Brinson, Allen Family Foods, Inc.; David Baker, Delaware Nutrient Management Commission; Richard and Joyce Morris, Finalists; John Hershberger, Mountaire Farms, Inc.; Samuel Slabaugh, Finalist; and Jim Parsons, Perdue Farms, Inc.



Left to right: Bill Rohrer, DDA Nutrient Management Program Administrator; Guy Phillips, 2006 Delaware Environmental Steward; Tom Brinson, Allen Family Foods, Inc.; Nancy Phillips, 2006 Delaware Environmental Steward; and David Baker, Delaware Nutrient Management Commission.



The Nutrient Management Program has presented the Annual Environmental Stewardship Award since 2001.

Budget

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

The 2006, 2007 and 2008 budgets follow and are represented as fiscal years.

Note: The “Recommended Budget” shown was approved by Governor Minner as part of the 2008 operating budget.

	FY 2006 Budget	FY 2007 Budget	FY 2008 Recommended Budget
Program Operating Costs:			
Personnel	233,300	253,800	257,000
Federal Funds Section 319 (Clean Water Act)	26,100	30,000	30,000
Travel	4,000	4,000	5,500
Contractual	17,300	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	596,000	246,000
Federal Funds section 319 (Clean Water Act)	200,000	200,000	200,000
Federal Funds Ches. Bay Program	100,000	100,000	100,000
Nutrient Management Planning	451,800	101,000	451,800
Demonstration and Research	160,000	0	0
Penalties	301	0	0
TOTAL	1,663,801	1,526,800	1,532,300

References

Hansen, D., Nelson, J., Binford, G., Sims, T., Saylor, W. 2005. Phosphorus in Poultry Litter-manure: New Guidelines from the University of Delaware. College of Agriculture and Natural Resources, University of Delaware, Newark, DE

NonPoint Source Program (NPS) Annual Report. 2005. Agriculture,

Delaware’s Conservation Districts, pps. 5-6.

Saylor, W., Sims, T., Angel, R. 2005. Modifying Diets with Phytase: Mode of Action and Effects on Litter-Manure Phosphorous. University of Delaware and University of Maryland.

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.

Mission Statement

The Delaware Nutrient Management Commission’s official mission 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 pro-

mote a profitable agricultural community, and to help meet or exceed federally mandated water quality standards, in the interest of the overall public welfare.

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 nutrients.
5. Establish the elements and general direction of the State Nutrient Management Program.
6. Develop nutrient management regulations.



Public meetings of the Delaware Nutrient Management Commission are held monthly at the Delaware Department of Agriculture.

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.



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).



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.



Connie Larimore, Chairman of the Budget and Government Interaction Subcommittees, was appointed by the House of Representatives to represent Kent County poultry producers. She owns a 50,000-capacity poultry operation and 150-acre grain farm. She can be reached at (302) 398-8304 or (302) 270-7053.

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.



Ed Lewandowski, Chairman of the Rules and Regulations Subcommittee, was appointed by the House of Representatives as an Environmental Advocacy Group representative. He is currently the Executive Director at the Center for the Inland Bays. He can be reached at (302) 226-8105.



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.



Jack Manchester was appointed by the Governor as a New Castle County public citizen representative. He is a retired chemical engineer and member of the Delaware Environmental Alliance for Senior Involvement (DE-LEASI). He can be reached at (302) 994-5544.

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.



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.



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



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.

Delaware Nutrient Management Program Staff

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.



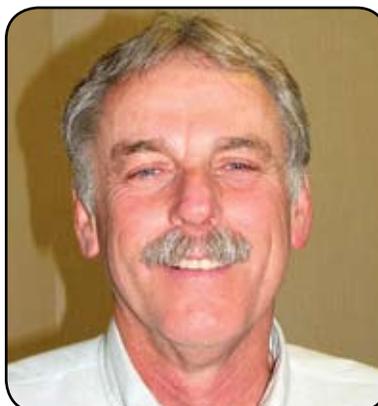
William Rohrer Jr., is the Program Administrator for the Delaware Nutrient Management Program and an ex-officio member of the Nutrient Management Commission. He can be reached at (302) 698-4500 or william.rohrer@state.de.us.



Charles West II was appointed by the House of Representatives to represent Sussex County Poultry producers. He owns an 88,000 broiler operation. He can be reached (302) 238-0137.



Steve Hollenbeck is the Environmental Coordinator for the Delaware Nutrient Management Program. He can be reached at (302) 698-4557 or steven.hollenbeck@state.de.us.



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



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.



Dr. Gerald Llewellyn serves for Secretary Vincent Meconi 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) 744-4540.



Pat Diehl is the Administrative Specialist for the Delaware Nutrient Management Program. She can be reached at (302) 698-4576 or patricia.diehl@state.de.us.



John Hughes, 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.



Judy Baines is the Office Assistant for the Delaware Nutrient Management Program. She can be reached at (302) 698-4558 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.



Dr. David Hansen is an Assistant Professor of Soil and Environmental Quality, Extension Nutrient Management Specialist with the University of Delaware. 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 is a Nutrient Management Extension Associate with the University of Delaware. She can be reached by calling 302-856-2585, Ext. 571.



Shawn Tingle is a Nutrient Management Extension Associate with the University of Delaware. 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:

- Gordon Johnson**, Kent County Extension Office at (302) 697-4000.
- George (Bud) Malone**, Extension Poultry Specialist at (302) 856-2585, Ext. 557.
- Corey Whaley**, Sussex County Extension Agent at (302) 856-2585, Ext. 594.
- Carrie Sterling**, Senior Secretary at (302) 856-2585, Ext. 574.

How to contact the Nutrient Management Program

To reach program staff members, call (302) 698-4500 or (800) 282-8685, or send an e-mail to nutrient.management@state.de.us.

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

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) 697-2600

Sussex County – (302) 856-3990



*“Water Quality
Is Everyone’s Responsibility”*