

Delaware Nutrient Management Commission
ANNUAL REPORT



2021

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DELAWARE NUTRIENT MANAGEMENT COMMISSION ANNUAL REPORT 2021

2021 was a challenging year for the Nutrient Management Program. It was a year marked by the continuing COVID-19 Pandemic, economic recovery, and new challenges in Delaware's agricultural sector.

In 2021, the Nutrient Management Program completed its 21st year since the passage of the Nutrient Management Law in 1999. The Law was enacted to address agriculture's influence on water quality in Delaware.

The mission of the Nutrient Management Program as laid out in the Law is: "To manage those activities involving the generation and application of nutrients to help improve and protect the quality of Delaware's ground and surface waters, sustain and promote a thriving agricultural community, and to help meet or exceed federally mandated water quality standards, in the interest of the overall public welfare."

The Nutrient Management Law established a 19-member Commission charged to develop, review, approve and enforce regulations governing the land application of nutrients.

This Annual Report to the Governor highlights the program's activities during 2021.

In Memoriam: James H. "Jim" Elliott Sr.



In 2021, we lost a leader and champion for both Delaware agriculture and our industry environment with the passing of long-time Nutrient Management Commissioner Jim Elliott. Born in Salisbury, Maryland, Jim was raised in Delmar, and was employed as a sales

executive with Proctor and Gamble for over 25 years. Jim served on the Commission for many years as a representative for the environmental community. In addition to his service with the Nutrient Management Commission, Jim served several years as mayor of Fenwick Island, and on the Sussex County Association of Towns. His contributions to the Commission were critical in reaching decisions that were both fair to the farming community and effective in protecting the state's waters. Jim will be deeply missed.



CAFO General Permit



In 2016, the first CAFO (Concentrated Animal Feeding Operation) General Permit covering medium and large poultry farms as a group was approved by a joint Secretaries order from DDA and DNREC. This general permit has been extended and is still in force. General Permits allow for a more streamlined administration of similar size and type farms. The permits' focus is on limiting discharges of pollutants and allowing for enforcement actions if these limitations are exceeded. The General Permit language was developed utilizing the Delaware CAFO regulations, the 1999 Nutrient Management Law, and the EPA Permit Writers' Manual. During the period 2016- 2019, a total of 217 farms were public noticed for the CAFO General Permit. No farms were public noticed in 2020. In 2021 five additional farms were public noticed. As of December 31, 2021, 217 farms have received coverage under the CAFO General Permits, issuance of permits for the remaining five farms is pending.

TRAINING AND EDUCATION CRITICAL TO SUCCESS OF NUTRIENT MANAGEMENT



Nutrient Management Training, Education and Certification

Due to the COVID-19 pandemic, the University of Delaware Cooperative Extension found the need to use a modified approach to initial nutrient management certification training, exams, and continuing education during 2021. The Delaware Nutrient Management Certification Sessions were offered three times in 2021 to individuals who apply nutrients to ten or more acres of Delaware land or have commercial livestock operations. The certification sessions provide the latest information and tools to encourage the adoption of best management practices to reduce the risk of nutrient loss to water. Due to the ongoing pandemic, certification sessions offered in the Spring of 2021 were held outdoors when possible and indoors during inclement weather. Since its inception in 2001, the University of Delaware Cooperative Extension has provided state-mandated certification training to over 3,800 individuals and certified more than 3,400 individuals. In 2021, the University of Delaware Cooperative Extension offered 15 initial certification sessions and five examination sessions, with 42 individuals newly certified.

In-person continuing education opportunities continued to be impacted by the COVID-19 pandemic, as strict distancing requirements placed capacity limitations on venues, and many certified individuals could not assume the health risks of attending events in person. The University of Delaware Cooperative Extension offered four new online continuing education modules in addition to the 22 standing modules. The various online modules were completed

424 times by individuals seeking continuing education credits. In addition to the online modules, 117 face-to-face or live webinar programs offered continuing education credits and were attended by a total of 1,923 individuals certified through the Delaware Nutrient Management Program. A total of 66 hard copies of educational modules were mailed to certified individuals who did not have reliable access to the internet or the ability to attend classes in person. These constituents completed 405 nutrient management training modules through the mail. In November, the 2021 Mid-Atlantic Crop Management School was held as 20 one-hour webinars related to nutrient, crop, pest, and soil management. The total attendance during the Mid-Atlantic Crop Management was 272 people. This included 77 individuals certified by the Delaware Nutrient Management Program, who earned 622 total credits.



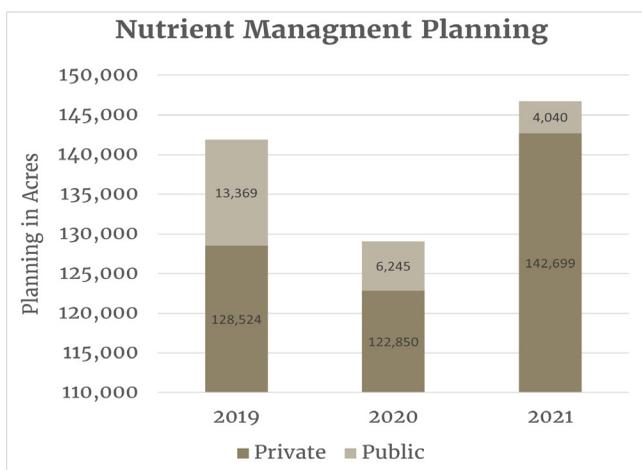
NUTRIENT MANAGEMENT ANNUAL REPORTS

The Nutrient Management Law requires anyone operating under a nutrient management plan or animal waste management plan to submit an annual implementation report for each calendar year. These reports detail all organic and inorganic nutrient handling activities from January 1 through December 31.

During 2021, the program mailed 1,254 annual reports to agricultural, golf course, and lawn care operations throughout Delaware. Annual reports were sent to farmers living in neighboring states who till the ground and raise livestock and/or poultry on farms located in Delaware.

Farmers and other regulated facilities submit their nutrient management annual report accurately represent nutrient handling activities within Delaware. The accuracy of the information provided on these annual reports is vital to ensure all farmers and hired applicators follow the recommendations outlined in their nutrient management plans. The data also helps the Nutrient Management Program advocate on behalf of Delaware nutrient handling operations.

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 likelihood that nutrients escape waterways decreases. A plan is developed by a certified

nutrient consultant and includes contents such as maps, soil analysis, manure analysis, crop yield goals, and nutrient application rates.

The Commission depends on private and public nutrient consultants to develop nutrient management plans for farms, golf courses, and other urban turf operations. In 2021, such operations representing 138,659 acres were reimbursed at a capped rate. The Kent and Sussex Conservation Districts assisted Delaware farmers by writing nutrient management plans totaling 4,040 acres. These acres represent an obligation for at least three years of nutrient management planning. The total acreage covered by nutrient management planning reimbursement during 2021, including those farms approved during 2019 and 2020, was 407,442 acres.

COUNTY CONSERVATION DISTRICTS

The Conservation Districts provide technical agricultural professionals who can assist in nutrient management strategies and recommendations. The Districts are also responsible for administering the Cover Crop Cost-Share Program.

NEW CASTLE COUNTY (302) 832-3100

KENT COUNTY (302) 741-2600

SUSSEX COUNTY (302) 856-3990

UNIVERSITY OF DELAWARE

Several specialists from University of Delaware Extension provide certification training for the Nutrient Management Program. They also assist the program by providing technical recommendations and conducting research and demonstration projects on nutrient management practices. Specialist are located in each county to assist Delaware farmers.

NEW CASTLE COUNTY (302) 831-2667

KENT COUNTY (302) 730-4000

SUSSEX COUNTY (302) 856-7303

Nutrient Management Relocation

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 Relocation Program allows farmers to move the litter-manure themselves or hire a broker. The application process validates eligible senders, receivers, truckers, and alternative use projects.



Poultry litter continues to be transported for land application throughout Delaware and to adjacent states, Maryland, New Jersey, Pennsylvania, and Virginia. Pennsylvania mushroom farmers operate alternative use projects and are essential for managing poultry manure produced in excess of farmer needs in Sussex and Kent Counties. In 2021, relocation included 66,597 tons of poultry litter-manure, for a thirteen-year total of 1,237,172 tons. During 2021, almost 72% of the litter manure went to alternative use projects or was relocated to out-of-state locations for land application.

FY 2021 Relocation Summary

RELOCATION	TONNAGE
Delaware Relocation Projects with Financial Assistance	66,597
Farm to Farm within Delaware	18,999
Farm to Farm Exported from Delaware	41,152
Farm to Alternative Use: Mushrooms	6,446



Complaint Resolution

Complaints related to manure management and general nutrient handling practices are investigated and resolved by program staff. If the violation is deemed serious enough, the complaint can be upgraded from an informal complaint to a formal complaint. In such a case action is taken by the Commission in the form an administrative hearing.

Twenty informal complaints were received and resolved by program staff in 2021 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	50%
Odor	10%
Mortality Management	30%

OPERATION TYPE

Poultry	50%
Field Crop	50%



Nutrient Management Plan Audits

Each year program staff performs audits on a number of facilities required to operate with a nutrient management plan, records, and certification. This process helps ensure that plans meet the intent of the nutrient management laws and regulations. Due to COVID-19 restrictions and the need to practice social distancing, staff took a hiatus from audits beginning in March 2020. In 2021, program staff audited nutrient management plans for 27 agricultural and concentrated animal feeding operations.

BUDGET SUMMARY

FY2022	Available	Spent
General Funds		
Personnel	\$367,889	\$367,889
Travel	\$0	\$0
Contractual	\$11,548	\$11,548
Supplies	\$1,987	\$1,987
Poultry Litter Transport	\$246,000	\$246,000
Education & Certification	\$129,945	\$129,945
NM Planning	\$411,800	\$411,800
Cover Crops	\$ 2,900,000	\$ 2,900,000
State Subtotal	\$ 4,069,169	\$ 4,069,169
Federal Funds (Multi-year)		
Chesapeake Litter Relocation (2015,2021)	\$ 608,428	\$ 178,937
Chesapeake Bay Regulatory (2017)	\$ 371,696	\$ 368,756
Federal Relocation and Coordinator (2019, 2021)	\$ 154,130	\$ 153,733
Federal Coordinator =(2020)	\$ 130,499	\$ 139,297
Multipurpose Grant (2021)	\$ 28,657	\$ 28,657
Federal Subtotal	\$ 1,293,410	\$ 819,724



Making Every Acre Count

By Jen Nelson (DACD) and Mark VanGessel (UD)

Delaware boasts one of the highest cover crop adoption rates in the nation. In 2017 (the last the Ag Census), Delaware farmers planted about 20% of their total harvested cropland in cover crops- nearly four times the national average of 5%.

The rate that cover crop adoption is increasing in Delaware is higher than average. In the last few years, the number of acres planted to cover crops has climbed significantly, with the 2021-2022 growing season expected close to 30%.

Much of that success is due to the long-term investment in a cost-share program to help offset the cost of planting cover crops. The focus of the state's cover crop program has been to improve water quality through nutrient management and soil erosion prevention. Small grain species effectively prevent soil erosion and nitrogen leaching after cash crops are harvested, so these cover crops have been a critical element of watershed restoration efforts.

There are multiple factors that affect Delaware's adoption from year to year, with the highest adoption rates occurring in years where cost-share programs are fully funded, and the weather cooperates. Delaware still has a way to go to reach our goal to plant cover crops on every eligible acre.

As the program has grow, so have the reasons why Delaware farmers are planting cover crops and the range of cover crops species planted. For farmers making management decisions for their operations, cover crops can offer a number of benefits depending on the individual goals for that farm. Here are a few management considerations to offer as a starting point to optimize those benefits, depending on the desired outcome.

Species Selection

Cover crop species are divided into three broad categories: small grain cover crops, brassica cover crops (mustard family), and legume cover crops. Small grain cover crops include cereal rye, wheat, and barley and are well suited for nitrogen scavenging, erosion prevention, weed suppression, and building soil organic matter. The stems of cereal cover crops break down slowly after

termination and help maintain soil moisture levels late into the summer. Brassica cover crops include radishes, rapeseed, turnips, and mustards. Brassicas are planted earlier and tend to produce rapid fall growth. Some varieties of radishes (daikon-type or forage radishes) can grow significant-sized tap roots to help alleviate soil compaction and draw nutrients from deep in the soil profile. This requires planting in early September. Brassica cover crops produce mainly leaf tissue that breaks down rapidly after termination.

Legume cover crops such as crimson clover and hairy vetch can produce nitrogen that is used by the following crop if planting and termination timing allow for sufficient growth. Legumes have fleshy stems and lots of leaf material that does not persist as long as small grain species. If planting legumes for the first time, use an inoculant for your selected species to improve nitrogen fixation in the plant.

Planting Timing and Method

The Conservation Districts' cost-share program guidelines include planting deadlines for cover crops to ensure that the cover crops can establish successfully before winter sets in. These deadlines vary by species, with small grain species tolerating a later planting date and brassicas (such as radishes) requiring an early planting date.

Planting cover crops well ahead of those planting deadlines will often increase many of the benefits of the cover crop. Cover crops respond to growing degree days just like cash crops do- warmer soil and air temperatures and longer days will result in more growth, both above and below ground. (Cover crops also respond to nutrient availability- planting into a field with residual nitrogen will result in more biomass production than fields with low fertility.) Early planting translates into greater biomass, more organic matter, more ground cover, increased nutrient uptake and retention, and a more extensive root system. The early establishment is essential if a farmers primary goals for using cover crops include nutrient capture and preventing soil erosion over the winter or if you're using radishes to break up soil compaction.

Every season is different, and sometimes a warm winter will allow for successful cover crop establishment later than expected. Rye is a suitable cover crop species to consider planting later in the season, as it tolerates cold weather better than other species.

The planting method is another piece of the puzzle



to consider. Choices for planting methods include broadcasting, drilling, aerial application, and (in Sussex County) air seeding. Methods that result in greater seed-to-soil contact, especially drilling, will generally result in a better cover crop stand but are also a little slower and can be difficult to accomplish alongside harvest operations. Increased seeding rates can help to compensate for both later planting dates and planting methods with less seed-to-soil contact.

Termination Timing and Method

The timing to terminate cover crops will significantly impact the benefits of using covers. Just as planting earlier in the fall tends to result in increased biomass, so does later termination in the spring. If the primary goal is weed suppression or to increase soil organic matter, allow that crop to grow later into the spring. (One caveat is later terminated cover crops can use soil moisture. This can be good in a wet spring but a disadvantage in a dry spring.)

With the timing of termination, plan ahead on the termination method. Earlier termination tends to allow for easier termination through a variety of different methods, including tillage and herbicide use. Mowing will not kill most cover crops. Later termination can be accomplished through the use of herbicides or roller crimping, but necessitates a game plan for how these products or methods will be applied.

Glyphosate is very effective on most small grain cover crops but not as effective for legumes or mustards, so selective effective herbicides based on species present. Successful termination with a roller crimper requires use at the early flowering stage of the species. Cover crops flower at different times, complicating when to use roller crimper.

Some species of cover crops, including radishes and

oats, may winter kill and simplify management in the spring. In Delaware, however, winters are often not cold enough to successfully kill the cover crops, and contingency plans are needed to control these species. Roller crimper's are often used to knock down the cover crop, not to kill the cover crop.

Allowing the cover crop to remain standing or to roll it down depends on many factors, including how much biomass is present on planter setup. It is difficult to generalize which approach is best.

For a farmer who is practicing later cover crop termination, it is wise to try these methods out on a small amount of acreage before adopting this strategy across the whole farm.

Two excellent resources for further guidance include the Northeast Cover Crop Council and the Sustainable Agriculture Research and Education, or SARE. NECCC's website (northeastcovercrops.com) offers decision tools, including a Cover Crop Explorer and Species Selector Tool. SARE's website (sare.org) houses excellent guides and reports from local research, available to download for free. Their popular guide, "Managing Cover Crops Profitably," is now in its third edition.

These management considerations are a beginning framework for anyone looking to expand the use and benefits of cover crops to their operations. Conservation Districts, NRCS, and Extension specialists are available to all of Delaware's farmers to help fine tune management strategies for individual operations.



ON FARM ENVIRONMENTAL PRACTICES QUESTIONNAIRE

By Clint Gill, CAFO Coordinator

In 2021, the Delaware Department of Agriculture piloted a Questionnaire for Annual Implementation Report based on producers 2020 farm activities. This questionnaire was developed by the Department and the Delaware-Maryland 4R Alliance with help from the University of Delaware College of Agriculture social scientists. The questionnaire consisted of 17 questions, focusing on environmentally beneficial practices that are not captured in our legally required Nutrient Management Annual Report.

The main objective of this questionnaire was to quantify voluntary practices, implemented without cost-share, that the Program has no way of tracking or quantifying otherwise. The need for this questionnaire arose out of an understanding that producers are engaging in environmentally beneficial practices for financial sustainability, land stewardship, or water quality, yet there was no organized way to capture these environmentally positive practices.



After considering options for obtaining this data with the aforementioned partners, the Commission settled on this questionnaire. This option had many benefits the Commission approved of, low cost, quick and easy, touching every producer, and an opportunity for outreach.

The questionnaire asked straightforward questions, and could be mailed out to producers with the legally required Annual Report. In order to encourage participation, the Department developed and published a tutorial video going through the questionnaire and offered continuing education credit for participation.

With the data provided by this survey, the Department will have the opportunity to provide more data-rich progress reports to the Environmental Protection Agency and the Chesapeake Bay Program. After verifying practices reported in our routine inspection protocol, the State will also be able to claim these practices in the Chesapeake Bay Model, contributing to our overall nutrient load reduction to the Chesapeake Bay. Unfortunately, verification lagged in 2021 due to in-person restrictions; however, the Program is confident that we will be able to perform verification and claim credit for these enhanced practices. The Department will use its existing standard operating procedure for auditing the legally required Annual Reports, with the important distinction that there are no regulatory consequences for inaccuracies reported in the questionnaire.

What the Department hopes to gain from this questionnaire is quantifying Best Management Practices we have not to this point been able to quantify. While the same survey will be sent out to report on the 2021 farming year, we hope to use the results to refine the questionnaire to better able to capture the information we are seeking. In addition, the Department hopes that this survey tool will provide a better understanding of the practices our producers are using so we can more efficiently support them in protecting the environment.

MEMBERS OF THE NUTRIENT MANAGEMENT COMMISSION

The Nutrient Management Law established a 19-member Commission that is charged to develop, review, approve and enforce regulations governing the land application of nutrients.

F. Kenneth Blessing, Jr., Commission Chairman was appointed by the Senate to represent Kent County vegetable farmers. He was named the Chairman by the Governor. He can be reached at (302) 422-5746.

Larry Jester, was appointed by the Senate as a representative of the New Castle County grain industry. He can be reached at (302) 547-8462.

Marcia Fox is the Conservation Programs Section Administrator in the Division of Watershed Stewardship of the Department of Natural Resources and Environmental Control. She can be reached at (302) 739-9170.

Mark Adkins was appointed by the Governor to represent swine farmers. He can be reached at (302) 732-3007.

Hannah Small represents an environmental group. The Senate Minority Leader appointed Hannah. She can be reached at (302) 378-2736.

Wayne Hudson was appointed by the House Minority Leader as the Commercial Nutrient Applicator representative. He can be reached at (410) 543-3919.

Laura Hill was appointed by the House of Representatives to represent Sussex County poultry farmers. She can be reached at (302) 945-0725.

Todd (Tak) Keen was appointed by the Senate as a Nutrient Consultant. Tak can be reached at (302) 645-7883.

Ken Horeis was appointed by the Speaker of the House of Representatives to represent the equine industry. He can be reached at (302) 270-2648.

Bud O'Neill was appointed by the Governor as a representative for the golf course/lawn care industry. He can be reached at (302) 653-8618.

Alan Bailey was appointed as a representative for the dairy industry. He can be reached at (302) 245-3150.

Jon C. Nichols Jr. was appointed by the Governor as a representative of the commercial nursery industry. He can be reached at (302) 697-2200.

Scott Webb was appointed by the House of Representatives to represent Kent County. He can be reached at (302) 381-0402.

Garry Killmon was appointed by the Governor as a public citizen. He can be reached at (302) 349-4494.

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

Shawn Garvin, 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.

Jamie Mack, Chief of Health Systems Protection in the Department of Health and Social Services, Division of Public Health, is an ex-officio member and he can be reached at (302) 744-4832.

For More Information

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DELAWARE DEPARTMENT OF
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