

NUTRIENT MANAGEMENT PLANNING IN GEORGIA: AN OVERVIEW OF REGULATIONS, EDUCATION AND TECHNICAL ASSISTANCE

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Abstract. In congruence with Federal strategies, Georgia has adopted the Nutrient Management Plan (NMP) as the method to address non-point source pollution from animal feeding operations. A certified planning specialist is required to write and/or review plans before they can be turned in to the state. It is the philosophy of the Georgia program that all permitted producers should have an understanding of nutrient management, as well as participate in the development of their plan. To achieve this, producers must also complete a 2-day nutrient management and environmental stewardship training course as well as pass a certification exam.

In Georgia, multiple agencies and private and public entities are cooperatively addressing needs relating to NMP's, such as development of regulations, enforcement, education and technical assistance. The bulk of nutrient management plan training, writing/development and technical assistance is currently being handled by the Cooperative Extension Service, both at the state and county level. To date, Georgia has certified approximately 400 operators, accounting for nearly all swine, dairy and poultry farms with liquid waste under the requirement. The Georgia program has been implemented with little cost to the farmer. A perceived strength of the program is the farmer and employee involvement in development of the plan. The lessons learned by Georgia and other states involved in regulated nutrient management can benefit the refinement of current systems as well as the development of new ones.

INTRODUCTION

Largely driven by an increasing focus on agriculture as a source of non-point source pollution, animal feeding operation regulation has drastically changed in recent years. Since the U.S. Clean Water Act was passed in early 1970, tremendous resources have been put into cleaning up point source pollution from

municipalities and industries through the National Pollution Discharge Elimination System (NPDES) and associated permits. Many believe that the success of the program in reducing much of the nation's point source pollution, led to the focus on reducing pollution from non-point sources such as urban storm-water runoff and agricultural runoff. Risse, Gaskin, and Bass (2002) cite that as part of the focus on agricultural sources of pollution, the United States Environmental Protection Agency (EPA) and the United States Department of Agriculture (USDA) have developed a *Unified National Strategy for Animal Feeding Operations*.

As summarized by Risse, Gaskin, and Bass (2002), the unified strategy focuses on using Comprehensive Nutrient Management Plans (CNMPs) to reduce the risk of excess nitrogen and phosphorus entering our surface and ground waters. The national focus on animal feeding operations (AFOs) increased pressure for Georgia to develop regulations for these operations. In addition to the CNMP strategy, stricter NPDES rules apply to the larger confined animal feeding operations (CAFOs); the 2002 Federal CAFO rule revisions are to be published in January 2003. In Georgia, the AFO and CAFO/NPDES programs are administered by the Georgia Department of Natural Resources (GA-DNR), Environmental Protection Division (EPD). Through a memorandum of understanding some responsibilities are shared with the Georgia Department of Agriculture (GDA).

In 1999, the Georgia Department of Natural Resources proposed new regulations for the swine industry. These rules were finalized in April of 2000. Then in December of 2000, new rules and regulations were proposed for non-swine animal feeding operations. These regulations were approved in January of 2001, and only apply to operations with liquid manure handling systems. Both the swine and non-swine regulations are amendments to Georgia's Rules for Water Quality Control, Chapter 391-3-6. Following the federal system for standardizing regulations across

species, Georgia's operations are regulated according to the "animal unit" (A.U.) scale. Different regulations apply for AFOs with 300 A.U. or less, 301 - 1,000 A.U., 1,001 - 3,000 A.U. and more than 3,000 A.U (Risse, Gaskin, and Bass, 2002).

Although small operations (<300 A.U.) are not subject to these state regulations, they are subject to the Clean Water Act and the Georgia Water Quality and Control Act. They are not allowed to have discharge to surface waters and should use nutrient management planning. Georgia recognizes a "bad actor" provision in the regulations. If there is evidence of pollution, even a small operation can be designated a CAFO by EPD, and would be subject to the Georgia animal waste regulations. Both the swine and non-swine regulations focus on the operations developing and following a comprehensive nutrient management plan (CNMP) and having a Certified Operator. Smaller operations (301 to 1,000 A.U.) have to apply for a Land Application System Permit (LAS) and larger operations have to obtain the more detailed NPDES permit (Risse, Gaskin, and Bass, 2002).

EDUCATION AND CERTIFICATION

Three immediate needs precipitated from the acceptance of these regulations. First was the development of a training and certification program for farmers on nutrient management and environmental stewardship; second was the development of a sister program to train existing technical assistance providers on how to write nutrient management plans; and third was to develop an appropriate nutrient management plan (NMP) template for the state. Few models existed for consideration while developing the Georgia program.

The EPD of GA-DNR delegated the authority for training and certification to the GDA, who in turn approached the Georgia Cooperative Extension Service (UGA-CES) to bring the expertise and experience of the Land-Grant University to the AFO/CAFO program in Georgia. Extension took on the task of developing a 14-16 hour training program for operators of animal waste management systems on both AFO's and CAFO's. Experts in specified areas were recruited across the College of Agricultural and Environmental Sciences at UGA to develop presentations, chapters for a course manual and a question bank from which GDA could develop and administer a certification exam.

The animal waste system operator certification program covers the following areas: Introduction to

NMP's, GA Regulations and Environmental Stewardship; Farm Maps and Critical Area Identification for NMP's; Soil, Manure and Monitoring Well Analysis; Assessment of On-Farm Nutrient Supply; Manure Storage and Treatment Systems; Nutrient Budgeting and Application; Land Application Equipment and Calibration; Monitoring and Record Keeping; Emissions from Animal Production Systems; Emergency Action Planning; Phosphorus Specific Issues; Mortality Management; Additional Environmental Management and Compliance Issues; Additional Federal and State Resources/Assistance. These topics are presented in the context of operating an animal feeding operation with one or more types of waste management systems. Only a single "certified operator" is required per farm, however many have had multiple employees or family members certified through the course.

While farmers are given the training and tools necessary to begin a NMP, the regulations require the oversight of a certified NMP specialist, often referred to as the "certified planner". The overwhelming percentage of certified planners, currently registered with the GDA, are UGA-CES county agents. The planner certification process also begins with a 2 day, 14-16 hour training. The subject matter is similar to that of the operators, however it is more targeted towards plan development and less on operation of facilities. Private consultants, various state agency employees and a few farmers have also gone through the certification process. Also attendees of both trainings receive similar but separate manuals. Each contains expanded chapters on each of the training presentations as well as sample plans, full references of appropriate regulations, and resources for additional assistance.

Both trainings contain an evaluation component. Each author of material for the trainings produced an oral/visual presentation, technical manual chapter and a battery of questions on their respective topic. It was then up to GDA to develop, from the question bank, a comprehensive exam for the entire training. Questions vary each time the exam is given. Operators and planner alike must make a 70% score for certification. In the event of a non-passing grade, a satisfactory score can be attempted two more times before the training must be retaken. While similar in content the planner's exam has additional technical content and is moderately more difficult. The exam is proctored and graded by GDA. Approximately 90% of operators have made a passing grade on the first try. As expected, the pass rate for agricultural and environmental professionals taking the specialist training is nearly perfect.

Over the last three years, efforts were made to reproduce the courses two to three times per year for the operator certification and one to two times per year for certified specialist training. Courses were conducted in different geographic locations around the state to accommodate participants as much as possible. A video of the operator certification was produced by Georgia Farm Bureau (GFB) and GDA to provide an independent study option for producers needing certification who absolutely cannot attend a scheduled course. Such producers would still be required to take and pass the same exam proctored by GDA at a local or regional location to the producer. These trainings, as well as the support materials were made available to operators and planners at little cost due to funding from GDA, EPD, Georgia Milk Producers, Georgia Pork Producers, and UGA, as well as in kind donations from GFB.

PLAN DEVELOPMENT AND TECHNICAL ASSISTANCE

The Georgia Permit Management Plan is based on a template generally accepted by GDA and EPD reviewers. It was developed from federally requested components as well as from components of the Natural Resource Conservation Service CNMP. A state permit NMP must contain the following information: a scaled map of the farm showing information such as property lines, land use, field boundaries, surface water, well locations, and buffers; nutrients produced on the farm from either site specific data or book values; nitrogen available for land application on an annual basis; details about the land application system such as the system type, frequency of irrigation, crops, and Best Management Practices used; nutrient balance (the amount of nutrients generated on the farm versus the amount of nutrients that can be used by crops on the farm); a mortality management plan for typical annual mortalities and catastrophic mortalities; a list of the records kept on the farm; an emergency response plan; and a closure plan. The Georgia NMP template, resources, tools, regulations and permit applications are available at: <http://www.engr.uga.edu/service/aware>.

So far the typical situation for developing an NMP involves an initial collection of data by the farmer. Such information includes historical records for soil tests, manure analysis, irrigation records, operating specifications for irrigation equipment and any original design information which may exist for engineered animal waste storage structures. If needed,

the certified planner may assist in collecting this information. The Natural Resource Conservation Service (NRCS) has proven to be very helpful in this pre-planning stage both by providing design information on structures and by developing the required NMP maps using the NRCS Toolkit and ArcView® software. County agents do not have access to such resources and NRCS produces an excellent product in the maps. Once all of the necessary data is collected, the certified planner and producer begin developing the plan cooperatively. A plan must be signed by the certified operator of that farm as well as a certified planner. The plan is submitted to the GDA for review by an NMP specialist, who will make suggestions, request further information or pass along to EPD for final acceptance.

There are two main stages of technical assistance and guidance related to the Georgia nutrient management program. The first is during the development of the NMP and the second during implementation. Maintaining this living management plan will also require periodic assistance. Technical assistance for operators and planners has so far been handled by Extension specialists. Issues addressed most often were verification of calculations, addressing non-typical waste management systems, interpretation of lab results, and clarification on submittal procedures and liabilities. The UGA Agricultural and Environmental Services lab handled much of the manure, soil and water sampling issues, while animal waste specialists based in the Biological and Agricultural Engineering Department addressed the bulk of questions.

October 31st, 2002 was the last date a solely nitrogen based nutrient management plan could be legally submitted. A phosphorus risk analysis is now required in GA NMP's. The Georgia Phosphorus Index is the approved tool for this purpose. It takes into account numerous variables such as soil test P, vegetation cover, slope, soil erodibility, buffers and depth to ground water in determining the appropriateness of phosphorus application to certain fields. The Georgia P Index is available online at: <http://www.ga.nrcs.usda.gov/gatechnical/afo.htm>.

As previously mentioned, NRCS was involved in developing some valuable components to the plan. Other entities in Georgia who have contributed to this development process are Georgia Soil and Water Conservation Commission (SWCC), EPD, GDA and private consultants. The role of these agencies will be very important as operators begin to implement their NMP's which could require installation of best management practices, modification or addition to waste storage and handling systems, siting and development of

new land application areas and requests for financial assistance through appropriate conservation programs.

The state has agreed to temporarily provide a copy of submitted plans to animal waste specialists at UGA for anonymous collection of selected data. This data will provide information on the most common application methods for animal manures, acreage for application at AFO/CAFO's, nutrient characteristics of manures and soils tested, crops grown and many other statistics currently undocumented in Georgia. Such information will be valuable in identifying needs for education, technical assistance and research.

MAINTENANCE AND ENFORCEMENT

Both certifications require continuing education components, although they are managed differently. Certified operators must complete 4 hours of continuing education hours on waste management, water quality or environmental stewardship every 2 years. These hours must come from courses or events approved by GDA. Anyone can submit a program agenda, course description and instructor list to GDA for approval. Commodity association meetings, local Extension programs, as well as topical conferences have qualified in the past. It is the operator's responsibility to fill out an attendance form and submit it to GDA who has a master list of hours completed by each certified operator.

Continuing education credits for certified planners are managed more liberally. Accruing the required 4 hours every two years is generally not a problem for planners. As most are Extension agents and specialists, engineers or certified crop advisors, they already engage in numerous appropriate programs per year. It is the responsibility of the certified planner to keep a log book of hours gained in areas relevant to the nutrient management program which is subject to GDA audit at any time.

Currently, Extension specialists are bearing the burden of promoting continuing education programs. Ways to facilitate more county and local trainings by agents, commodity groups, and environmental groups for CEU's are being examined. Other resources available to planners and operators during plan development and implementation include a Georgia animal waste newsletter and website. The website has many downloadable tools, forms, templates and a software program to facilitate the completion and submission of NMP's and permits.

In the weeks before the non-swine NMP's were due Extension was able to release a beta version of a

software package to assist planners in producing NMP's. The software greatly cut down on duplicative calculations and data entry, it cross-referenced where necessary and could produce a report in the state recommended format. Currently final modifications are being made for the dairy version. Other specie specific editions will be developed in the near future. Such software was not available for last year's round of swine NMP's. It saved hours of work for planners who had to produce over four times as many plans as were required for swine farms in Georgia.

While EPD is ultimately responsible for AFO/CAFO rule and permit enforcement the memorandum of understanding with GDA will allow inspections by either entity. It is believed that the experience and knowledge of GDA inspectors within the agricultural industry will facilitate efficient, thorough and diplomatic inspections. As of Fall 2002, the first joint inspections were being carried out. The program and MOU will continue to be developed and defined.

CONCLUSION

To date, Georgia has certified approximately 400 operators, accounting for nearly all swine, dairy and liquid waste managed poultry farms under the requirement. Approximately 150 nutrient management planning specialists are certified, of whom the majority are county Extension agents. NRCS is expected to submit a list of planners who have gone through the more comprehensive NRCS conservation and nutrient management planning programs. At this time it is not known how dry litter poultry operations will be brought under the regulation, a minimum assumption could include over 2000 farms who will need NMP's and certified operators.

Cost to the producer during the NMP development and operator training phase has been minimal. The certification trainings and materials were free to producers with no limit to the number of employees or family members one farm could send. Identifiable costs to the producers were their own time, travel to the site and one night's lodging for some. The trainings were held at regional centers to minimize travel for farmers.

Perhaps the best success to the Georgia program is the level of producer involvement in creating the plan. It is the belief of the authors that plans produced cooperatively by Extension agents and producers are realistic working plans and are most likely to be used as true management tools. Risse et al (2001), previously expressed the value of practicality in nutrient management when they stated "a slightly imperfect, less

comprehensive, yet practical plan will almost always produce greater results than a perfect one that is not practical to implement". Feedback from farmer participants at the operator certification has been positive with indicating the training was worthwhile and not just another mandate.

Providing continuing education hours for farmers through local programming has been identified as a shortcoming of the current system. More opportunities need to be offered by County Extension, Local Commodity Groups and other entities with local presence such as Farm Bureau or Young Farmers Association. Legitimate tools for independent study are also being investigated. It is a challenge to routinely provide programming in close geographic proximity to farmers and to present relevant topics that are new and interesting.

The inclusion of dry litter poultry operations to the AFO/CAFO rules will drastically affect the way the NMP program will need to be managed in Georgia. The management of these farms is very different from operations with large livestock species or even other poultry operations with liquid manure management systems. When the new CAFO rule is adopted in Georgia, appropriate NMP templates and training programs will need to be developed. Delivery options for these programs will have to be evaluated since numbers of farms affected could reach over 2000.

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