Delaware's Animal Agriculture: Its Role in Nonpoint Source Pollution and Options for the Future

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Delaware agriculture has been dominated by a large and geographically intense poultry industry for more than 20 years. Today, about 260,000,000 broiler chickens are produced annually in a state with about 225,000 hectares of cropland. More than one-half of this cropland is used for the production of soybeans, where land application of animal manures is not recommended. Research dating back to the 1970's has investigated the relationship between poultry manure management and water quality, particularly nitrate-N contamination of ground waters and eutrophication of fresh and estuarine waters by nitrogen (N) and phosphorus (P). The fundamental cause of the nutrient-management problems facing Delaware's animal agriculture today is that geographic intensification has resulted in large surpluses of N and P, with no options to land application to agricultural crop land. A second, non-trivial cause is the numerous difficulties in efficiently managing animal wastes as nutrient sources (for example, storage, handling, analysis of nutrient content, and timely applications). Together, these factors have resulted in nutrient accumulations in soils to excessive levels and nutrient losses to ground and surface waters and to the atmosphere.

Today, Delaware's poultry industry faces many challenges. The U.S. Department of Agriculture/U.S. Environmental Protection Agency (USDA-USEPA) Unified Strategy for Animal Feeding Operations contains recommendations and requirements that will affect the economics of poultry production by intensifying the requirements to protect the environment. Further, in 1997 Delaware entered into a total maximum daily load (TMDL) agreement with USEPA as a result of a lawsuit filed against USEPA by a consortium of environmental groups. In the TMDL agreement, the State of Delaware agreed to reduce N and P loads to surface waters by as much as 60-85%. State legislation has been passed in Maryland, Virginia, and Pennsylvania and is now under consideration in Delaware that directly affects nutrient use by poultry producers and also impacts the poultry integrating companies. Clearly, a proactive approach is needed to address the nutrient-management challenges faced by Delaware's poultry industry.

This paper first presents an historical review of the research conducted in Delaware since the 1970's on the relationship between poultry waste management and water quality. Understanding the nature of the N and P management problems faced by the poultry industry is critical to the development of solutions. Next, a summary of the options available to reduce nonpoint-source pollution by nutrients origination in animal agriculture is provided, along with an analysis of the pros and cons of each option. Finally, a systematic approach forward is proposed, one that will both sustain the profitability of animal agriculture and protect and improve water quality in Delaware.

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