

Preventing Water Contamination

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Protection of water sources on farm and off is the responsibility of every one. Unfortunately, farm practices necessary to grow crops, livestock and poultry have potential to cause contamination of water bodies. In the case of poultry production, the potential to contaminate is in the form of improper litter and manure application rates and methods. When applied properly litter can be of great benefit to the soil in providing nutrients for plant growth and prevention of soil erosion. Four components of litter and manure that make it a good fertilizer and can impact water quality are nitrogen, phosphorus, pathogens and organic matter. Excessive litter and manure application can allow these nutrients to reach streams resulting in possible algal blooms, fish kills and eutrophication. It is important that companies and their growers are aware of the possible links between poultry production operations and water contamination and take the steps needed to protect ground and surface water from excessive siltation and the nutrients in manure, litter, compost or poultry mortality.

Sources of water contamination

Soil erosion, leaching, surface water runoff and water contamination are linked. Soil erosion is a result of soil particles that become loose from rainfall, wind, or ice. These soil particles can be washed away as runoff into streams. Watersheds are areas of land from which water drains to a collective point along a stream, river, pond or lake. Runoff from land application sites and manure and feed storage units is a common transport of contaminants. The manure and litter contaminants mentioned earlier can travel with surface runoff and soil erosion. Phosphorus, pathogen, ammonia and organic matter are commonly associated with runoff and erosion. Water is a natural solvent, which gives it the ability to carry minerals and chemicals. The removal of soluble substances from soils or other material by water is referred to as leaching. Most of the manure and litter contaminants will be filtered by the soil, but nitrates can leach into ground water reservoirs. This does not mean that the other litter contaminants can not reach the groundwater. Two pathways in which the other contaminants (P, pathogens, organic matter) that are filtered out by the soil can reach ground water is through macropore flow and around bore hole of wells. Macropore flow is where root holes, worm holes, and cracks in the soil allow contaminants to bypass the soil filtration and reach groundwater. Wells that are installed improperly, or located near contamination sources can provide a direct pathway to groundwater. Another possible source of water contamination is ammonia volatilization and deposition. As the ammonia evaporates it has the potential to travel many miles and can be redeposited through rainfall or dry deposition.

How can poultry production contribute to water contamination?

Broiler production is Georgia's single largest agricultural commodity. Broiler litter, compost and poultry mortality are nutrient-rich materials and can benefit the farm if they are protected adequately and applied to the land correctly. However, as mentioned previously, some of the

nutrients in manure and litter from broiler, broiler pullet/breeder, and layer operations are mobile and may be washed away. If proper storage, disposal, or application of these nutrient –rich materials is done improperly, they can threaten farm water sources. Excessive manure and compost application to farmland increases the risk of minerals and other substances leaching into ground water.

What can poultry producers do?

Many growers today are already taking advantage of modern best management practices that will lower the risk of contamination.

- Proper storage of litter – Litter stacked on a restrictive surface (concrete, plastic, clay, etc.) or on a non-leaking stacking shed with a concrete floor. The stack should be located at least 100 feet from a well and surface water. The stack should not be exposed to rain.
Link to:”See Litter storage information (Casey or Bill?)”
- Proper disposal of dead birds – Dead bird carcasses should be disposed of by an approved method according to the guidelines provided by the Georgia Department of Agriculture. The Georgia Department of Agriculture currently approves the following disposal methods:
 - ✓ Burial
 - ✓ Landfill
 - ✓ Composting
 - ✓ Incineration
 - ✓ Rendering

Link to: “See dead bird disposal (Casey’s section).”

- Proper Application rates – Apply litter to fields at rates that meet crop nutrient requirements that are based on a nutrient management plan. As a part of the plan records indicating litter and soil testing results should be kept. Application should never be done during extremely wet conditions or if the land is frozen. Application should be 25 feet from rock outcrops, 100 feet from surface water sources, wells, dwellings or sinkholes. Areas where litter application is done should have a slope of 15% or less. Equipment used to apply litter to designated areas should be calibrated to ensure proper application rate and checked on a regular basis.
Link to Merka’s section
- Poultry house areas – Vegetation is one of the easiest ways to prevent drainage and erosion problems. Areas that do not experience vehicle traffic should have at least 90% vegetative cover. High traffic areas should be graveled or paved. Ditches, grading and drainage pipe should be used to address areas that have drainage problems.
- Well Protection – Proper wellhead protection includes proper well siting, proper well construction, keeping contaminants away from the well, backflow prevention, sealing abandoned wells, and testing of well water on a routine basis.

Link to: Tyson’s article on “wellhead protection for farm wells”

Using the proper combination of these management practices can maximize fertilizer value while reducing the risk of water contamination. You gain economic as well as environmental benefits from the use of these practices in preventing water contamination.

References and Related Publications

Georgia Soil and Water Conservation Commission

P.O. Box 8024
Athens, GA 30603

Manual for Erosion and Sediment Control in Georgia

<http://www.gaswcc.org>

University of Georgia, Cooperative Extension Service or Local County Extension Office

Athens, GA 30602

- Georgia’s Ground Water Resources, Bulletin 1096
<http://www.ces.uga.edu/pubcd/b1096-w.html>
- Well Head Protection for Farm Wells, Circular 819-3
<http://www.ces.uga.edu/pubcd/C819-13W.html>
- Animal Waste and the Environment, Circular 827
<http://www.ces.uga.edu/pubcd/c827-w.html>
- Poultry Waste, Georgia’s 50 Million Dollar Forgotten Crop, Leaflet 206
<http://www.ces.uga.edu/pubcd/L206-w.html>
- Calibration of Manure Spreaders Including Swath Width, Circular 825
<http://www.ces.uga.edu/pubcd/C825-W.HTML>
- Land Application of Livestock Manures, Leaflet 378
<http://www.ces.uga.edu/pubcd/c826-w.html>
- Composting Poultry Mortalities, Circular 819-5
<http://www.ces.uga.edu/pubcd/c819-15w.html>
- Animal Waste System Operator Certification Training Notebook
<http://www.engr.uga.edu/service/extension/aware/>

For more information concerning this notebook:

<http://www.engr.uga.edu/service/aware>

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- Poultry Water Quality Handbook
[http://www.poultryegg.org/About USPOULTRY/Industry Partners/PWQC/pwqc.html#handbook](http://www.poultryegg.org/About_USPOULTRY/Industry_Partners/PWQC/pwqc.html#handbook)