



# Assessing Your Poultry Litter Management and Carcass Disposal

*H. Charles Goan, Professor and Leader  
Animal Science—Poultry*

The goal of this *Farm•A•Syst* factsheet is to help you protect and improve the groundwater that supplies your drinking water as well as the ponds, lakes, rivers, and streams that make Tennessee beautiful.

The following questions are designed to help you pinpoint potential problem areas on your farmstead. These problem areas may contribute to the

contamination of your drinking water if they are not managed properly.

If your answer to any of these questions is *YES*, or if you don't know the answer, you may have a high-risk situation in your home or on your farmstead. Refer to the fact section with the same number as that question (under the heading, "What you should know about . . .") for more information.

**YES NO**

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Do you stack litter outside the poultry house and leave the stack unprotected from rainwater?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Do you stack litter within 100 feet of a water well, stream, pond, or sinkhole?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Do your litter application rates exceed nutrient requirements for pasture, hay, tobacco, corn, cotton, small grains, or any other crop? |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Do you ever apply litter without testing it for nutrient content or conducting a soil test?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Do you ever apply litter when the soil is frozen or saturated with water?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Do you apply litter to any areas within 100 feet of a water well, stream, pond, or sinkhole?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Do you apply litter to any area that has a slope greater than 15%?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Do you apply litter to the land without regularly recalibrating the spreader?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Do you apply litter to the land without keeping records of application rates and dates?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Do you dispose of poultry carcasses by throwing them in an open pit, ditch, ravine, or sinkhole?                                       |

Don't be alarmed if you answered *YES* to many or even all of these questions. That does not automatically mean you have a water-quality problem. It may, however, tell you that change is needed to avoid potential problems. In the same way, answering *NO* to every question does not mean you are *not* at risk.

## Why should you care?

**Groundwater** is the underground water that supplies wells and springs and recharges surface water bodies. It is the source of drinking water for many Tennesseans. Up to 20 million gallons of groundwater may be stored under the typical farmstead—stored within 100 feet below fertilizer and pesticide storage areas, fuel tanks, livestock pens, and septic systems, all potentially major sources of pollution. The management decisions you make on your farmstead can significantly affect the quality of your drinking water and your family's health. These decisions can also affect your potential legal liability and the value of your property.

**Surface water** includes bodies such as ponds, lakes, rivers, and streams. Besides their aesthetic and recreational value, they are often an important source of drinking water for livestock.

Maintaining the quality of our surface and groundwater is an issue that concerns everyone today. This means that each poultry producer must work to ensure that poultry **litter** (poultry-house bedding material and manure removed periodically and often used as fertilizer) does not pollute our water resources.

Most broiler operations produce approximately one ton of litter for every thousand birds. This litter is rich in nitrogen and other nutrients, which makes it an excellent fertilizer *if it is handled properly*. As much as one quarter of the nitrogen in fresh poultry litter is fairly mobile, which means it can easily **leach** (move *with water* through the soil) if placed in contact with the soil.

Poultry litter can contaminate surface or groundwater by 1) leaching through the soil; 2) running off with surface water from areas where litter has been stacked or applied; or 3) being directly discharged into water resources. This can easily affect the water that you drink every day. Nitrate above certain levels in drinking water is hazardous to your health.

Therefore, excessive application of poultry litter to the land can lead to water-quality concerns, as well as to odor and insect problems. Reduced crop yields can also result from over-application.

Poultry litter is a valuable resource when handled and used properly. It can greatly reduce the need for commercial fertilizers. However, in order to protect the environment, it is extremely important to use good management practices when handling, storing, and spreading poultry litter.

*Farm•A•Syst* is only for your own use and benefit. It is a voluntary program intended to provide general information about protecting and improving water quality. Information from a *Farm•A•Syst* assessment will not be collected by Extension or any other outside agency and should remain in your private records.

## What you should know about . . .

### 1. Litter storage

Leaving stacked litter unprotected, particularly during periods of wet weather, is not recommended. If the stack is exposed to rain or snow, nitrogen and phosphorus can leach from the litter and contaminate surface or groundwater. Stacking the litter on a concrete slab or a clay surface restricts the movement of nitrogen into the soil. Covering the stacked litter with a securely anchored 6-mil plastic cover also offers some protection. The area around the stack should be designed to direct surface water away from it.

However, the best management practice for temporary litter storage is a roofed storage shed with a concrete or packed clay floor. Cost-sharing for such storage sheds may be available from the Farm Service Agency (FSA). These funds are only available for farmsteads that have an approved nutrient management plan, and the design of the shed must be approved by the Natural Resources Conservation Service (NRCS) before it can be accepted by FSA. For more information on the construction of litter storage structures, see Extension publication PB 176, *Storage Facilities for Broiler Litter*.

## 2. Storage distance from water sources and sinkholes

Stacked litter should be located at least 100 feet from any water well, stream, pond, or sinkhole. If possible, the stack should also be located downslope from any water source. Any water sources downslope from the stack should be protected by a strip of grass between the stack and the water source. The grass will help to filter out solids, slow down runoff, and, over time, use up excess nitrogen before it has a chance to leach to groundwater.

## 3. Application rates

Litter application rates—how much you should apply and when—depend on three things: the type of crop to be fertilized, the nutrient content of the litter, and nutrient content of the soil before the litter application is made. For application rates for various crops, see Extension publication PB 1421, *Poultry Manure—Proper Handling and Application to Protect our Water Resources*, or the table on page 5 of this factsheet.

## 4. Nutrient content

Both the soil on your farmstead and the litter you plan to apply should be tested for nutrient content. The results determine the litter application rates that are appropriate for the crops on your farm. Applying litter according to these rates reduces the potential for water pollution.

Soil testing involves taking samples from several areas in the fields where you intend to apply litter. Litter samples should also be taken from several areas in the poultry house or in the litter stack. Your county Extension agent can give you more information on conducting these tests, including the names of laboratories and estimates of fees.

## 5. Soil saturation

Litter should not be applied when the soil is saturated, frozen, or covered with snow. The potential for surface-water runoff is increased when these conditions exist. Also, do not apply litter when precipitation is in the immediate forecast.

## 6. Application distance from water sources and sinkholes

Litter application within 100 feet of a water well, stream, pond, or sinkhole increases the potential for water contamination. Putting a 25- to 50-foot grass filter strip between the application area and water sources is a good practice.

## 7. Slope of the land

Rapid water runoff from a steep slope covered with litter increases the potential for water contamination. A 25- to 50-foot grass filter strip between any slope and a water source helps minimize the risk. Constructed terraces also help to reduce runoff.

## 8. Spreader calibration

Litter cannot be used effectively if you do not know how much you are applying. Calibrating your spreader periodically is a simple and effective way for you to make sure that you are properly using the plant nutrients in litter without risking harm to the environment. For calibrating procedures, see Extension publication SP 414, *Calibrating Spreaders for the Application of Poultry Manure*.

## 9. Recordkeeping

Good recordkeeping is essential for any farming operation. Accurate records allow you to review your farm's history of applying litter to various areas and note the results. These records should include the results of soil and litter nutrient analyses, the dates and amounts of litter application, the dates and amounts of fertilizer application, the types of crops planted in a season, and the yield produced.

## 10. Carcass disposal

Acceptable methods for the disposal of poultry carcasses are composting, incineration, and disposal in covered pits. Composting and incineration are the methods least likely to cause harm to water resources. Covered disposal pits should be the last option considered because if the pits fill with water, nitrogen and other contaminants from the decaying carcasses can leach to groundwater. If you do choose to use a covered pit, it should be at least 100 feet from any water source or sinkhole.

Compost bins should meet the following requirements: 1) they should be practically odorless; 2) they should reach a temperature of at least 150°F so that pathogenic bacteria are destroyed; 3) they should completely decompose carcasses so that only remnants of feathers and bones are left; and 4) they should not attract flies. For more information on composting, see Extension publication PB 1445, *Dead Poultry Composting*.

Incineration may be the most practical carcass disposal method on farms with one or two poultry houses. The incinerator must meet guidelines set by the EPA and the Tennessee Division of Air Pollution

Control for odor and for the release of small particles into the air. Odor is usually the biggest problem when an incinerator is not operating properly.

## Remember:

- Cover stacked litter with plastic or store it in a roofed structure.
- Keep stacked litter at least 100 feet from any well, stream, pond, or sinkhole.
- Apply litter to crops at the recommended rates.
- Test your soil to determine its nutrient needs.
- Analyze the nutrient content of your poultry litter and use the results to determine how much litter to apply to the soil.
- Never apply litter when the soil is saturated, frozen, or covered with snow, or when precipitation is in the immediate forecast.
- Apply litter on a steep slope only when the proper precautions have been taken, such as constructing a terrace to control rapid runoff.
- Never apply litter within 100 feet of a well, stream, pond, or sinkhole.
- Recalibrate your spreader periodically.
- Compost or incinerate all poultry carcasses.
- If you use a covered pit for carcass disposal, make sure it's at least 100 feet from any water source.

## If you want more information . . .

### Contact:

- Your county Extension office
- Poultry Water Quality Consortium  
Larry Goff, Liaison  
TVA, CST 17D-C  
1101 Market Street  
Chattanooga, TN 37402  
(423) 751-7297

- Tennessee Department of Environment and Conservation (TDEC)  
Division of Air Pollution Control  
401 Church Street  
L&C Tower, 9th Floor  
Nashville, TN 37243-1531  
(615)532-0554
- U.S. Environmental Protection Agency's Safe Drinking-Water Hotline (M-F, 8:30 a.m.-5:00 p.m. EST)  
(800)426-4791
- Your local FSA office
- Your local NRCS office
- Your local Soil Conservation District office

### Read:

*Poultry Manure—Proper Handling and Application to Protect our Water Resources.* PB 1421.  
*Dead Poultry Composting.* PB 1445.  
*Well Water Protection on Poultry Farms.* PB 1457.  
*Storage Facilities for Broiler Litter.* PB 1476.  
*Calibrating Spreaders for the Application of Poultry Manure.* SP 414.

These publications are available from your University of Tennessee Agricultural Extension Service county office.

### Download:

These sites on the World Wide Web (WWW) are good places to start when browsing the Internet for information about water quality:

- <http://funnelweb.utcc.utk.edu/~utext>  
(University of Tennessee Agricultural Extension Service)
- <http://www.epa.gov>  
(U.S. Environmental Protection Agency)
- <http://www.usda.gov>  
(U.S. Department of Agriculture)
- <http://h2o.usgs.gov>  
(U.S. Geological Survey)
- <http://www.dtnsh.er.usgs.gov>  
(Tennessee division of USGS)
- <http://hermes.ecn.purdue.edu:8001/server/water/water.html>  
(National Extension Water Quality Database Website, Purdue University)

## Application Guidelines

Tons per acre of poultry manure to apply, by crop and manure type, for first-year application<sup>1</sup>:

Crop	Layer		Broiler
	Fresh	High Rise	Litter
	tons per acre <sup>2</sup>		
<b>Corn</b> 100-125 bu. 125-150 bu.	8 10	5.5 6.5	3.5 4.5
<b>Cotton</b> upland bottomland	4 - 5 2 - 4	3 - 3.5 1.5 - 3	2 - 2.5 1 - 2.0
Small Grain	2 - 4	1.5 - 3	1 - 2
Grain Sorghum	4 - 6	3 - 4	2.5 - 5
<b>Bermudagrass Pasture</b> common hybrid	4 - 12 8 - 12	3 - 8 5 - 8	2 - 5 3.5 - 5
<b>Fescue Pasture</b> spring fall	3 4	2 3	1 2
Grass Hay	4 - 7	3 - 5	2 - 3.5
Summer Annuals	4 - 8	3 - 5	2 - 3.5
Tobacco	5.5 - 7.5	4 - 5.5	2.5 - 3

<sup>1</sup>Based on N requirements of crops and pounds of available N per ton.

<sup>2</sup>Ranges in amounts to apply reflect ranges in N recommendations for the various crops.

Tennessee *Farm•A•Syst* publications are adapted from Wisconsin and Minnesota models and Arkansas, Florida, and Mississippi materials. They have been adapted by Karin A. Beuerlein and members of the University of Tennessee Agricultural Extension Service Environmental Stewardship Priority Program Team.

This project is funded, in part, under an agreement with the Tennessee Department of Agriculture and the U.S. Environmental Protection Agency. The mention of trade names or commercial products does not constitute endorsement or recommendation by the State or the Environmental Protection Agency.



*Printed on recycled paper*



R12-4110-04-001-97 SP484L-5M-12/96

*A State Partner in the Cooperative Extension System*

The Agricultural Extension Service offers its programs to all eligible persons regardless of race, color, national origin, sex or disability and is an Equal Opportunity Employer.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture,  
and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service

Billy G. Hicks, Dean