MARYLAND COOPERATIVE EXTENSION
UNIVERSITY OF MARYLAND
COLLEGE PARK•EASTERN SHORE

Fact Sheet

Fact Sheet 723

COMPOSTING CATASTROPHIC EVENT POULTRY MORTALITIES

The Delmarva broiler industry produces over 630 million birds annually in an area generally defined by the limits of the Chesapeake Bay and Atlantic Ocean to the east and west, by Smyrna, Delaware to the north, and Exmore, Virginia to the south. Five vertically integrated companies operate in this region with approximately 6,200 active production houses. Broilers rank first in gross agricultural income for both Delaware and Maryland. Because of the high bird density per square mile, there are many opportunities for recycling byproducts from broiler production and processing, including normal and catastrophic event mortalities. Large numbers of dead poultry can be composted on the farm to avoid the costs of transport and tipping fees, reduce the potential spread of pathogenic diseases, and prevent potential ground water pollution from burial practices. The compost process is the same used for normal mortality, but without the composting bins. However, composting materials must be on hand for an emergency. This fact sheet will cover composting catastrophic event poultry mortalities.

COMPOSTING REQUIREMENTS

Composting can be defined as the controlled decomposition of organic materials. Decomposition occurs when organic materials go through a "slow cooking" process as microorganisms metabolize the organics. Rapid decomposition is an aerobic process, requiring oxygen. The process will produce carbon dioxide, water vapor, heat, and compost. The combination of the cooking process, rapid degradation, and compost cover minimizes odor and flies. In order to generate a healthy poultry composting process, the following four elements are necessary:

1. Proper nutrient mix—The carbon:nitrogen ratio (C:N) is very important for microorganisms to process the organic materials into compost. The C:N should be in the range of 20:1 to 35:1. A carbon:phosphorus ratio (C:P) of 100:1 to 150:1 is also desirable.

2. Moisture—Moisture is also very important for the microbial activity to process the organic material into compost. A range of 40 to 60 percent is desirable. The process will not operate effectively if the material is too dry or too wet.

3. Temperature—If the C:N ratio, moisture, and oxygen are at the proper levels, thermophilic aerobic bacteria activity will cause the mass to heat to temperatures ranging from 135 to 145 °F. Carbon dioxide and water vapor are generated as byproducts of the composting process. Temperature should be monitored by using a 36-inch stem composting thermometer.

4. pH control—A proper C:N ratio should keep pH in check. However, if for some reason the pH level approaches 8, ammonia and other odors may become a problem. The pH needs to be reduced by adding such products as granular ferrous sulfate. A pH in the range of 6.5 to 7.2 is best for composting.

COMPOSTING MATERIALS

The materials needed for composting are water; a bulking material such as straw, wood chips, or sawdust; dead birds; and poultry litter. Sawdust works well by itself as the only bulking material. These materials are layered into a pile or windrow no more than 12 feet wide and 7 feet high. The length of the windrow can be as long as necessary to hold the number of birds to be composted. Provide at least 1 cubic foot

of bulking material per 10 pounds of expected mortality (for example: 1,000 birds at 3 pounds each would require 300 cubic feet [11 cubic yards] of bulking material).

WINDROWS

WINDROW CAPACITY

A windrow 12 feet wide by 6 feet high will hold approximately 300 pounds of mortality per foot of length. Thus, 1,000 birds at 3 pounds each would require a windrow 3 feet long with appropriate end cover. The materials required per foot of windrow length (300 pounds of mortality) would be 14 cubic feet of litter (400 pounds) and 16 cubic feet of wood chips, sawdust, or straw (700 pounds).

BUILDING A WINDROW

1. Select a well-drained, slightly crowned site.
2. Make a bed layer of wood chips 12 inches thick and 12 feet wide for the expected length of the windrow. (If wood chips are not available use straw, sawdust, or dry loose litter, not caked litter.) If straw is used, make a fluffed layer 20 inches thick, because the straw will compress.
3. Add a 4-inch-layer of litter if fluffed straw is used as the base.
4. Deposit an 8- to 10-inch layer of poultry mortality that stops 1 foot from the edge of the lower layer. Figure 1 shows a layer with the mortality in place.
5. Spray the mortality with enough water to saturate the feathers.
6. Deposit a 6-inch-layer of sawdust, wood chips, or straw to the width of the chickens.
7. Repeat steps 3 to 6 two more times. Figure 2 shows a windrow cross-section.
8. Cover the pile with a layer of sawdust or other bulking material, 2 to 4 inches thick. Using a bucket loader, start at the top edge of the bottom layer and work toward the top by tipping the bucket and moving forward to continually dump as the bucket moves up the side of the pile. Figure 3 is a sketch of a completed windrow.
9. Add to the length of the windrow as more mortality develops.

MAINTAINING A WINDROW

1. Use a long-stem composting thermometer to check daily temperatures in the windrow. The temperature should increase and reach 135 to 145 °F within a week. If the temperature does not rise, call your cooperative extension agent for an assessment on the problem.
2. After 7 to 10 days the temperature will decline. As the declining temperatures reach 115 to 125 °F, turn the windrow.

Figure 1. A layer of mortality in a compost windrow.

Start on one end of the windrow and move the contents to form a new windrow. Turning will fluff the material and increase the porosity of the pile. The material should be lifted and dropped, not just pushed to a new space.

3. If the material is excessively dry (does not leave the hand moist when squeezed), then add water while turning. If the material is excessively wet (drips more than two drops when squeezed in the hand), add some dry litter or sawdust while turning.
4. Cover any exposed carcass tissue on the surface of the new windrow with more sawdust, other bulking material, or finished compost.
5. After an additional 3 or 4 weeks the compost can be added to manure in storage for land spreading.

SUMMARY

Composting large numbers of poultry mortalities is relatively simple and inexpensive. They can be composted in the bedding or litter where they were housed if the whole popu-

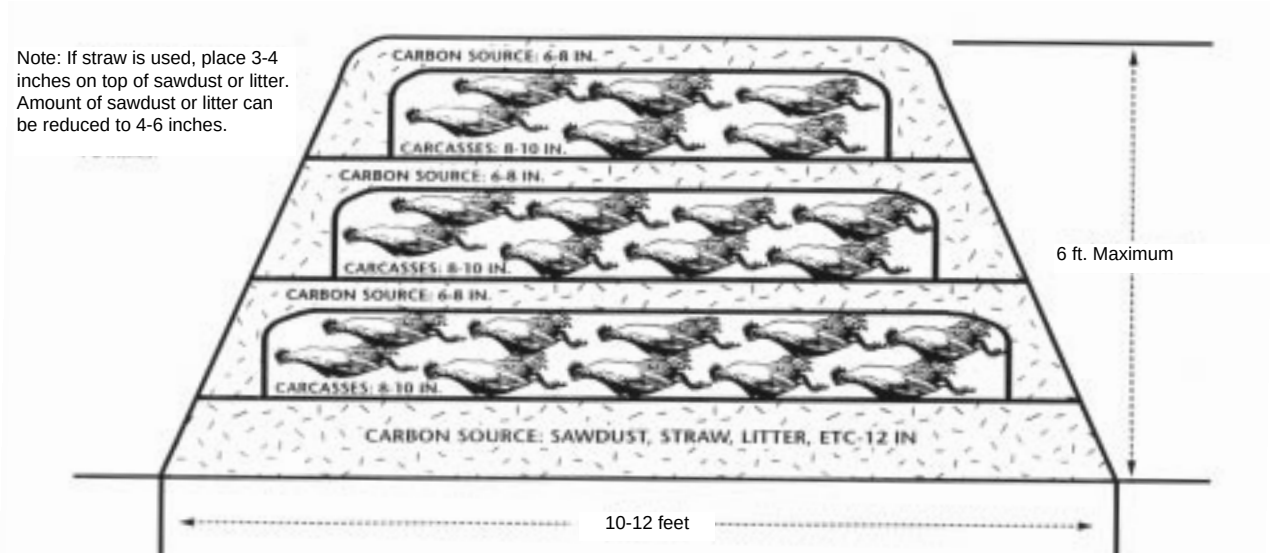

Figure 2. Cross-section of carcass composting in a windrow.

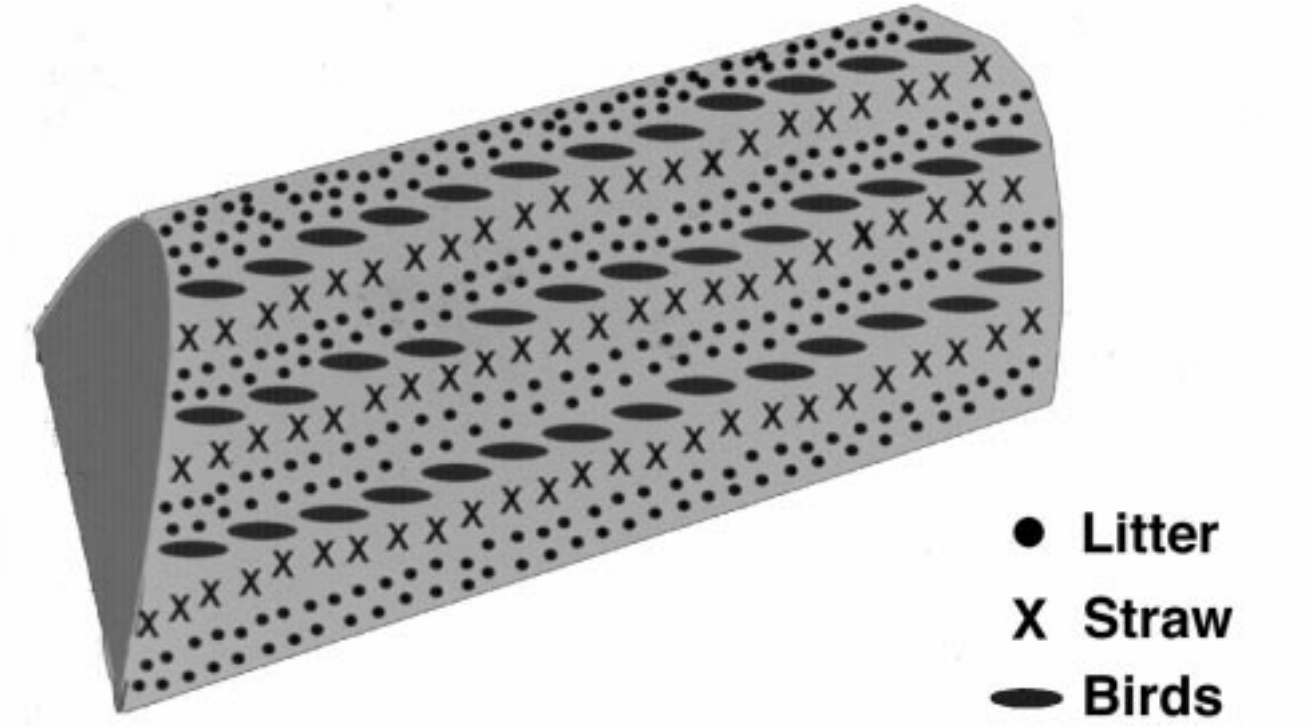

Figure 3. Completed catastrophic poultry composting windrow.

lation is involved and adequate space and time are available, or they can be composted outside. Some prior planning is necessary to insure that materials necessary for composting are available when needed. Composting should be considered over burial for water quality protection.

Companion Video

"On-Farm Large Scale Chicken Carcass Composting" clearly demonstrates the procedure for composting catastrophic poultry mortalities. The 11-minute video production was a joint effort between the Cooperative Extension Services of the Universities of Delaware and Maryland, the Delmarva Poultry Industry, Inc., and the Delaware Department of Natural Resources and Environmental Control. For more information, contact Lewis Carr or Nickolas Zimmermann at (410) 651-9111; or John Martin or George Malone at (302) 856-7303.

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