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Livestock Composting at the Allee Farm

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Abstract
Composting is becoming a popular way to handle livestock mortalities. The co-compost material, sometimes referred to as carbon source or bulking agent, is used to cover the mortalities and provide a microenvironment for bacteria. The co-compost material should be readily available, inexpensive, and free of pesticide residues. Some commonly used co-compost materials are turkey brooder litter, poultry litter, hoop barn manure, corn stalks, ground corncobs, wood shavings, and wood chips. Use of a compost thermometer is helpful to be sure that the process is occurring properly. Temperatures in the 110 to 150° F range indicate decay that will be fast and odor free whereas cold temperatures indicate problems.

Disciplines
Agricultural Science | Agriculture

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Introduction

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A dead animal is more than 80% water by weight. Once the skin breaks, aerobic bacteria decompose the carcass using the water and protein from the animal and the carbon from the co-compost material. The bacteria multiply rapidly. The co-compost material should provide air movement, yet insulate the process creating warm temperatures. The bacteria need temperatures above 50° F to thrive, but start to die above 160° F. The biologic multiplication of the bacteria doubles with every 20° F rise in temperature. The process will be hot, fast and without obnoxious odors. The heat will kill flies and keep mice and rodents out.

Materials and Methods

The composting project at the Allee farm continued in 2002 with the use of ground wood chips from the recycling center, turkey litter, and corn stalks. The building used for composting is an old open-front swine unit. In March, a 1,000 lb heifer was placed in the facility with corn stalks as the carbon source. After 3 weeks it was determined that the animal was not composting and the top cover was removed and replaced with turkey litter, which was already composting and warm. Within three days the animal was composting, and no further problems were associated with composting the rest of the year.

Red worm composting. A red worm composting project was started in the summer to investigate the use of red worms to dead animals. This process will be done at a higher moisture content and colder temperatures. Red worms could provide a good source of income from the composting process but would require more management. At Allee, the process was working for several months, but in the early fall our investigation showed no worms present. We will continue the red worm project in the spring with better attention to moisture conditions.

Results and Discussion

The project has successfully composted swine, beef, and poultry. The turkey litter is the most forgiving co-compost material with very little chance of failure, followed by the wood chips and then cornstalks. If the cornstalks have been used as bedding and are fairly dry, they may work better than cornstalks that have not been used as bedding. It is believed that the cornstalks allow too much air movement, cooling the process. Grinding the stalks may be the solution.

Follow these simple steps for successful composting:

1. Start with 18 inches of co-compost material on the compost bin floor.
2. Place dead animals in a single layer keeping them at least 6 inches from the edge.

3. Cover with co-compost material to at least the same depth as the mortality.
4. Add additional mortalities and co-compost material in layers, repeating steps 2 and 3.
5. Cover a final time with clean co-compost material, at least 12 inches deep in the summer and 18 inches deep in the winter. Do not exceed a 6 foot total depth.
6. After five days, use the compost thermometer to make sure that the process is proceeding properly. The temperature should exceed 110° F in the pile near the mortalities. The temperature probe can be left in the pile to monitor progress. Record the temperature and date. If the temperature has not exceeded 110° F after 5 days, call your ISU Extension specialist for assistance.
7. Turn the compost pile when the temperature has dropped 10 to 15° F below its high point. This usually occurs approximately 30 days after the last mortality was added to the pile. Use a loader to turn the pile or move it to a secondary bin. Cover the pile with 6–12 inches of clean co-compost material.
8. Use a maintenance log to record your actions and help you track the process.
9. Monitor the process. The temperature should rise to over 130° F within several days of turning. After about 10 to 20 days, the temperature will decline and the compost process is complete.
10. Use the compost. The completed compost can be reused as intermediate co-compost material if it is still dry enough and contains larger co-compost material. The completed compost can be land applied like dry manure to crop or pasture land at rates consistent with nitrogen use levels.

A common question is “Will there be bones?” The simple answer is “yes.” When the composting process is complete, all the soft flesh will be completely decomposed. Many of the bones will be soft and brittle, but some will remain. Most bones will shatter when they hit the manure spreader beaters. Those that remain are a source of calcium and phosphorus and are smaller than most rocks in the field.