Pork Prose

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DEAD PIG COMPOSTING

Success stories are mounting for composting dead pigs. Recipes differ, composting areas vary from one farm to another, but all operations use the same concept — the aerobic decomposition of organic material by microorganisms.

The Nature Of Composting

Because many aspects of composting are inexact, the process can occur over a wide range of conditions and with many materials.

For optimum composting, there should be 20 to 40 times as much carbon as nitrogen. Moisture content should be 40 to 65 percent. Particle size should be ⅛ to ½ inches in diameter. The pH of the mix should lie between 5.5 and 9.0, and there should be at least 5 percent oxygen in the pile.

Let's assume we're planning to compost a 120-pound swine carcass. A rough estimate of the carbon:nitrogen ratio for a pig that size is about 9. That's too low, so we'll have to add carbon. The carbon source isn't critical, although the texture will influence the composting process. Sawdust seems to be the material of choice because it has a small particle size, it's absorbent, handles easily, and has a high carbon content.

Charles Fulhage, extension ag engineer at the University of Missouri, recommends about 100 cubic feet of sawdust for every 1,000 pounds of carcasses. On that basis, our 120-pound carcass will require 12 cubic feet of sawdust.

Poultry litter, straw, or straw-manure mixtures have also been used. The straw mixtures may require longer composting times, but are otherwise satisfactory.

The moisture content for most hogs is about 60 percent, which is high for optimum composting. The carbon source will often bring the water content into the correct range, but if very dry material is added as a carbon source, up to .5 pounds of water must be added for every pound of carcass.

The pH of a live hog is about 7, but quickly drops following death. However, no adjustments need be made to ensure proper composting.

The concentration of oxygen is the mixture is important. When the material is first put into the compost area, air is naturally trapped in the layers. Microorganisms quickly use the available oxygen, and settling of the contents also expels the entrapped air.

Unless the pile is turned or air is otherwise injected, the aerobic process slows. In an operation where frequent turning is not practical, the use of a small-particle carbon source, such as sawdust, may be a disadvantage.

Straw, on the other hand, is more difficult to pack, and therefore may be the best choice if the pile is left undisturbed.

Systems That Have Worked

1. Composting bins made of large round bales. The May 15, 1993 issue of National Hog Farmer features a sketch of compost bins made of large round bales set end-to-end. Each compost bin is three-sided, with four bales making up the back wall, and three bales comprising each of the side walls. Two bins are needed (primary and secondary). For a 100-sow herd, the total area required in the two bins is 125-150 square feet. Start with 1 foot of sawdust in the primary bin. Place the carcasses and cover with a foot of sawdust. Continue layering carcasses and sawdust until the bin is full. After three months, move the contents to the secondary bin. After another three months, the material will resemble humus, with very little odor. Some easily-crumbled bones will remain.

2. 8 by 8 bins, with ventilated sides. These three-sided bins are constructed with 2-inch by 8-inch boards. A ½ -inch to ¾ -inch gap is left between the boards for air flow. Concrete walls can surround the wooden bin, as long as a four-inch air space is allowed between the concrete and wooden panels. In a demonstration project at the University of Arkansas, researchers successfully composted large and small pigs in these bins. A straw-broiler litter-straw "sandwich" was added to begin the composting process in early September 1992. After 48 hours, pigs and carbon sources were added using the following formula:

Parts by weight
1 pound pig carcasses (each weighing less than 25 pounds)
1.5 pounds broiler litter.
1 pound wheat straw
Up to .5 pound water.

Carcasses were added to the bin in layers over a 23-day period, then completely covered with litter. On the 37th day, when temperature at the 10-inch depth started to decline, the stack was moved to a secondary bin. Temperatures at various depths in the mixture ranged from 122 to 144 degrees F during the demonstration. The pile was removed 80 days after the first pig was added, and 54 days after the last pig was added. The only remains were hoofs, and some mummified skin which crumbled easily. In a related project, a sow was cut into 25-pound pieces and composted in another bin. After 74 days, the sow was totally decomposed except for the largest pelvic bones, a few large ribs, the skull, and the hoofs. All bones were bare with no meat or skin attached.

3. Empty pens in an open-front hog building. In this demonstration at the University of Missouri, pens from an open front building measured approximately 6.5 feet by 9.5 feet. To each pen, the following materials were added: a layer of straw (about 5 pounds/square foot), a layer of dead pigs, followed by a dry manure-straw mixture, and another layer of straw equal to one half of the weight of dead pigs. The layers were repeated until a final depth of about 3 feet was reached. The pile was left undisturbed for about 70 days (beginning late spring and ending in early fall). Composting was complete with smaller pigs (only a brown spot remained); however, larger hogs and sows did not break down completely, apparently because the mixture got a little too dry. No rodents were observed, but when the mixture was loaded onto the spreader at the end, there were a lot of cockroaches.

Summary

Composting continues to look promising as a method of dead pig disposal. It should be noted that this process is not formally covered by law (Pennsylvania Act 317, passed in 1945). However, the Bureau of Animal Industry is rewriting the law to include composting. In the meantime it recognizes composting as an acceptable means of dead animal disposal as long as the process is conducted in a manner that is not offensive or a threat to biosecurity.

The rate and effectiveness of composting is maximized under ideal conditions of carbon:nitrogen ratio, moisture, and oxygen concentration. Fortunately, the process is forgiving enough that a wide range of conditions will support satisfactory composting.

(Turn to Page C5)