

COMPOSTING

Solves a Smelly Problem

By Eva Ann Dorris

Composting may be a big part of the solution to waste disposal on hog farms.

MAFES research has found composting eliminates much of the odor associated with manure and is an efficient means of disposing of dead hogs.

Wayne Frank, assistant professor in waste management with MSU's animal and dairy sciences department, led a team that developed an alternative waste disposal system that keeps odor levels down and provides a value-added product for additional on-farm revenue. The three-year research project was funded in part by the Mississippi Farm Bureau Federation.

Under intense public pressure over the odor associated with swine production, the Mississippi Legislature issued a moratorium four years ago prohibiting the construction of any swine facilities. More specifically, the law was aimed at the waste management lagoon systems that go along with these animal production facilities. The legislative action allowed existing farms with traditional lagoon systems to continue in production, but no new facilities could be built.

In traditional waste management systems, swine waste is collected into lagoons and diluted with water. The effluent is then applied to surrounding pastures as a fertilizer. The ban on new construction of waste lagoons meant a new method of waste management and disposal was needed.

Frank's team's answer to that need is a modified deep-litter system. The system consists of a two-inch layer of sawdust maintained on solid, sloped concrete pen floors. As the pigs move around the pens, the sawdust is mixed in with the animal waste and moves down the slope where it is collected in a pit. The litter is then composted and can be used for row crop and horticulture production.

"We can provide the expertise and information needed to any grower who wants to convert to this system," Frank said.

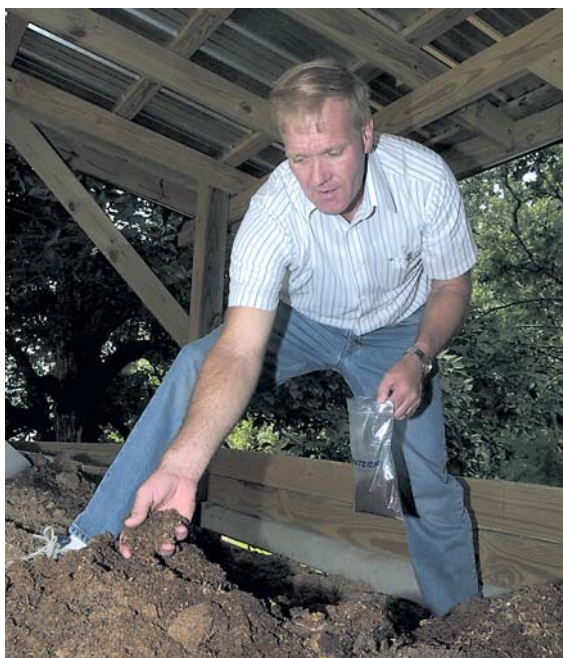
Since the moratorium on new hog production facilities, another obstacle has fallen into the path of all livestock producers. Because of concerns about the potential transmission of animal diseases, restrictions have been placed on mixing rendered animal protein with animal feeds. Previously, rendering plants purchased dead poultry and livestock for use in feed production. The new restrictions mean producers have to find other mortality disposal methods. Incineration seemed the likely alternative, but that too has restrictions.

"About the only other approved method to dispose of animal mortalities is in a landfill," Frank said, "and that is a short-term solution, which is expensive to the producer. Plus, the mortalities have to be transported off-farm to the landfills."

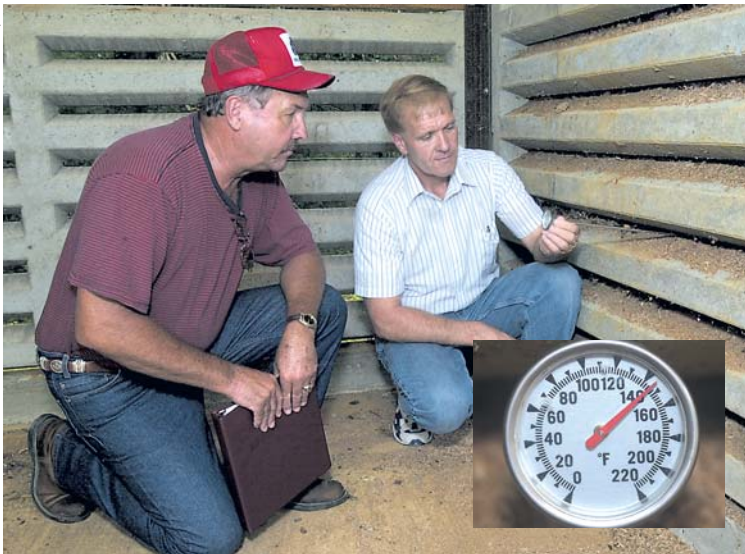
Researchers found composting to be the answer to this challenge as well.

"Temperatures in a composter get to about 140 to 160 degrees. That's crock pot temperature," Frank said. "We found if you put the dead animals into the composter, they will break down very rapidly, and after three days, will completely disintegrate into the compost materials."

Jim Lytle



Wayne Frank collects a sample from a compost bin.



Houston swine producer James E. Blissard, left, and Frank check the temperature inside a compost bin.



Waste management starts with proper feed management. Frank analyzes feed flow to minimize feed waste.

Research at MSU has led to inexpensive but efficient methods of on-farm composting and opportunities for additional on-farm revenue.

Frank's team found in-container composting with some method of rotation is the best method for Mississippi's humid climate. Options are as simple as building a homemade composter from steel road culverts placed on house trailer axles or purchasing used asphalt- or cement-mixing trucks. Commercial composting containers are more expensive and can handle up to 50 tons of compost per day.

"Composting reduces the volume of waste by 50 percent, and it reduces odors as the finished product has a pleasant earthy smell," Frank said. "It also kills all known pathogens and stabilizes nutrients, which means there are no runoff concerns. Nutrient runoff from composted materials would typically only occur when there is so much water that the compost floats away with the flow."

Frank said manure-source compost can be sold in bulk for application to pastures, row crops and truck crops, or it can be bagged and sold through retail markets. Presently, compost produced using mortalities is not approved for sale, but it can be used on-farm.

"I know of some dairy farmers who are making more now from selling their compost than they are from selling their milk," Frank said. "There is a great potential in selling this value-added product, but we

The modified deep-litter compost system is one answer to reducing odors associated with swine production, but researchers continue to explore other methods as well.

Ongoing projects at the university include work by MSU Extension Service swine specialist Mark Crenshaw to reduce fecal phosphorus by manipulation of animal diets, and work by MAFES agricultural engineer Tim Burcham to determine the feasibility of using biofilters such as kenaf to suppress in-facility odors.

need to work on the public's perception of composting, and we need to convince consumers of how good it is.

"This coming year we will be working with soil scientists to determine the benefits of using compost commercially. If we can develop a market for commercial compost, we can sell all we can produce," he said.