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Manure and Mortalities

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Manure and mortalities are inevitable in pig production. Both can be valuable sources of nutrients for crop production but require careful management to avoid negative consequences. This leaflet addresses manure and mortality management strategies that are appropriate for niche pork producers.

Manure

Bedded systems typical of niche pork production systems result in large volumes of manure and bedding mixtures. Handling this material can require a great deal of time and labor. A standard skid loader may not be sufficient to remove a large bedding pack. Producers who use hoop barns typically find that a front-wheel assist tractor with grapple fork attachment on the front-end loader is the best equipment to use.

Pig manure is a valuable source of nutrients for crops and should be utilized as a resource rather than perceived as a waste product.

There are several challenges to utilizing manure and bedding mixtures taken directly from pens or buildings:

- ◆ Variable nutrient content of the manure makes it difficult to estimate fertilizer value accurately.
- ◆ Physical characteristics of bedding such as cornstalks may create spreading problems.
- ◆ Irregular manure distribution may create problems in minimum tillage cropping systems.
- ◆ Large amounts of organic matter are returned to crop land, but unstabilized carbon in bedding can reduce nitrogen availability during the year after application.

Composting manure is a strategy that effectively addresses the above concerns. Composting is the aerobic decomposition of organic materials. For complete composting to occur, a temperature range of 110–149 °F within the compost is necessary. These high temperatures allow the destruction of weed seeds and pathogens.

Swine manure from hoop barns can compost well if the drier and wetter parts of the bedding pack are layered in the compost pile. With periodic turning, completely composted material is odorless, fine-textured, and low in moisture.

The equipment, space, and labor needed to convert large amounts of bedding and manure into finished compost may not be practical for some producers. Fortunately, the process of composting is continually occurring in bedded systems. Piling manure and bedding in simple windrows or piles of 5–7 ft high and 10–15 ft wide allows partial composting to occur and greatly reduces the volume of material to be delivered to crop land. In a two to three month period, volume and weight of the composting material can be reduced by 50–60% depending upon precipitation.

Land Application

Manure should be applied to crop land based upon nutrient content of the material and crop nutrient needs. Site-specific manure analysis allows more accurate prediction of the value of the manure and bedding as fertilizer for crops. Composting reduces the nutrient variability of the manure and bedding mixture and allows more uniform land application.

It is important to remember that the cumulative losses of nitrogen from bedded

systems tend to be higher than from slurry manure systems. Phosphorus and potassium are better conserved although loss of these elements will occur in outdoor composting systems if runoff and leaching is not limited. Immobilization of nitrogen by the carbon-rich manure and bedding pack can be

avoided by composting. However, with adequate cropland available, manure and bedding from fall cleanouts applied fresh to fields and then incorporated into the soil results in more total nutrients being delivered to the cropland (Table 1).

Table 1. Characteristics of fresh and composted bedded manure from swine finishing hoops¹.

	Pounds per ton		Percent ²	
	Mean	Range	Mean	Range
Fresh hoop manure				
Dry matter	700	540-1180		
Nitrogen ³	15.4	8-25	2.2	1.5-2.8
Phosphorus ³	6.9	5-8	1.0	1.5-2.8
Potassium ³	15.1	12-21	2.1	1.7-2.4
Compost				
Dry matter	1020	650-1530		
Nitrogen ³	19.6	13-35	1.9	1.2-2.8
Phosphorus ³	11.9	9-25	1.2	0.9-2.2
Potassium ³	20.1	19-36	2.0	1.0-3.0

¹ Adapted from AED 41.

² Dry matter basis

³ All nutrients are reported on an elemental basis (N, P, K; not NH₃, P₂O₅, or K₂O).

Mortalities

While health and husbandry practices minimize pig mortality, inevitably there is some death loss on pig farms. Disposing of these mortalities can be accomplished through rendering, incineration, burial, and composting. Storing and transporting carcasses results in risks of disease. Incineration generally is not practical for most niche market pork producers and burial may require excessive amounts of time, labor, and/or machinery. Some producers will use a series of post holes for burial of dead piglets, but burial is not a practical option during the winter months.

Composting mortalities is an attractive option because it allows the capture of the nutrients within the mortality while minimizing health risks for the operation.

Mortalities can be disposed by composting as long as the carcass is well covered on all sides. Generally 18 in of compost on the bottom, sides, and top of mortalities is sufficient to eliminate odors and avoid attracting scavengers. A pig carcass will typically degrade within 3–6 weeks depending upon the size of the animal and characteristics of the composting pile.

The resulting compost can be applied to crop land as regular manure and bedding compost. Some states have specific rules or guidelines for composting mortalities so it is important to check for regulatory compliance.

Additional Resources

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