

High-tech Meets Tradition in Compost Barns

By Beth Stuever, MSU ANR Communications

When Wayne Schoper flashed a photo of a new high-tech compost bedded-pack barn, one of the first questions to him was, “Isn’t this what we used to do?”

At first glance, these new barns may look like throwbacks to the 1950s — before freestalls became the norm on many dairies. But Schoper, University of Minnesota Extension educator, says the new compost barns lend themselves to better manure management, heightened cow comfort and cleaning ease.

“A properly managed pack provides a healthy, comfortable surface for cows to lie on,” he says. “Comfortable cows produce more milk.”

Compost bedded-pack barns are a loose housing system in which animals rest on top of a thick layer of sawdust that is stirred daily to enhance bacterial composting and keep the surface clean. Sturdy retaining walls line the area to hold the pack in place. In most dairies that use this system, cows move to a side alley to eat.

Schoper discussed the barns with 42 producers at a seminar in Zeeland, hosted by Michigan State University (MSU) Extension.

“The need for this seminar was really driven by producers who wanted more information about alternative housing systems,” says Charles Gould, MSU Extension agriculture and natural resources educator. “Wayne has good experience with these systems and brings a lot of practical knowledge to the table.”

High walls, solid surfaces

Compost barns can help producers cut capital investments when building. With the cost of building new freestall barns ranging from



Wayne Schoper, left, discusses the importance of a fine sawdust in compost packed-bedded barns. “You want it to be absolutely pulverized,” he says.

\$1,300 to \$1,700 per head, Schopers’ estimate of \$950 to \$1,350 per head for a compost bedded-pack system seems like a bargain.

“I’m still not convinced that it’s cost-effective to convert an old freestall barn,” he says. “But if you’re going to start from scratch, this can be very economical.”

The jury is still out on the optimum size for compost barns. Schoper says 80 to 85 square feet per cow is enough; others recommend up to 110 square feet. But everyone seems to agree that high walls and solid surfaces are key ingredients for successful composting.

Because good ventilation is a must for maintaining a dry bedded-pack surface, experts recommend open sidewalls be at least 14 feet high with curtains to control ventilation throughout the year. In addition, mixing fans installed over the bedded-pack area will increase surface drying and cool cows in hot weather.

“We found out the hard way that you’ve got to make sure the sidewalls are tall enough that you

can easily move your mixing equipment around the barn without smacking your head on fans or the ceiling,” Schoper says with a grin. “It’s a little thing that really makes a big difference.”

The next important ingredient is a solid clay base to prevent leaching. Then, a thick layer of sawdust is added.

“Good sawdust is the key,” Schoper says. “We like to see good, kiln-dried sawdust that is absolutely pulverized. Sawdust like this enhances composting and maximizes cow comfort.”

Maintenance is important

Schoper recommends that a bedded pack be stirred with a rototiller or S-tines twice each day at a depth of at least 8 to 12 inches. “The deeper, the better,” he says. “I like to see a good rolling action.”

Properly managed bedded-pack barns can be cleaned out twice each year and the contents spread on cropland for maximum nutrient management. Schoper says that in Minnesota, the typical analysis usually runs 21-9-15, and the bedding



Concrete barriers help hold the pack in place.

High temperatures ensure the bacteria in the pack are making compost.

can be applied at 16 to 18 tons per acre with 40 percent available nitrogen.

“That’s enough to support 200-bushel corn,” he says. “Plus, you could make good money selling it to lawn and garden centers. It’s not organic, but you could call it natural.”

Schoper cautions that feed alleys and other areas will still need to be scraped, and the maintenance of a small lagoon or alfalfa spray field is imperative.

Challenges

Though there are numerous nutrient management and cow comfort advantages to composting, the system doesn’t come without challenges. No. 1 on the list is finding suitable bedding. A bedded pack requires roughly 5 tons of sawdust per cow each year. Gould does not recommend using straw.

“Straw has a waxy cuticle that microorganisms have to really chew through. If you want to compost, you have to use sawdust.” Gould explains. And not just any sawdust will do. “Small particle size is important. You want something that has the consistency of pancake

flour. Larger particles will help with aeration, but they don’t break down quickly.”

Finding a source for the sawdust can be a bit challenging, but many farmers like the compost bedding enough they are willing to go to other states to find it.

“You have to have access to good sawdust,” he says. “In Minnesota, we’ve got farmers going to Iowa and paying \$950 for a semi-load of sawdust — about 65 cents per cow per day. They tell me that would have to triple before they’d consider going to freestalls, but you’ve got to have a source to make it work.”

“Guys are pretty tight-lipped about where they get their sawdust from because they don’t want to lose it,” Schoper says. “Your best bet is to find a sawmill or manufac-

turer of some type who has product to give.”

Because composting relies on bacteria to do the work, Schoper says producers who use the bedded-pack system need to play close attention during udder prep.

“The bedding surface has a lot of bacteria, so you really need to manage the cows once they are in the parlor to make sure the udders are good and clean,” he says. “If you do a good job of udder prep, your somatic cell counts can drop.”

Schoper says the Natural Resources Conservation Service loves bedded-pack compost barns because “there is no chance for pollution,” but Gould cautions those who wish to seek NRCS cost-share dollars.

“Michigan NRCS funds only manure storage, and this is considered housing,” he warns. “There is no cost share for housing. I’m hoping that they eventually see these as storage facilities and will provide funding, but those are the rules as they currently stand.”

Regardless, both Gould and Schoper think compost bedded-pack barns have potential in Michigan.

“I’m not saying freestall barns don’t work,” Schoper says. “But if I were looking at building a new barn, I’d strongly consider this type of barn.”

How Does Composting Work?

Compost is the end product of a complex feeding pattern involving hundreds of organisms, including bacteria, fungi, worms and insects. What remains after these organisms break down organic materials is the rich, earthy substance that crops love. Composting replicates nature’s system of breaking down materials on the ground. In every forest, grassland, jungle and garden, plants die, fall to the ground and decay.