Turn bedding into compost

Prominent Central Kentucky operations embrace relatively new concept considered environmentally friendly

by Cynthia McFarland

Courtesy of Lantern Hill Farm LLC

TURN FOR THE BETTER
Manure piles put in rows for composting purposes need to be turned on a regular basis to start a cycle that blends materials into a mix that provides heat, kills weeds and pathogens, and starts to break down the material

MANURE, and plenty of it, is a natural byproduct of any animal-production business. What to do with all that waste can pose a major question, particularly when serious issues such as groundwater contamination and disposal costs come into play.

In some areas, the Thoroughbred industry is taking proactive measures to deal with waste through composting, a relatively new concept for the horse business in the United States. Throughout Kentucky's Bluegrass region, at least 25 farms, including some very large operations, are now composting muck and reaping the benefits.

"The equine industry is so important, and we're trying to help them come up with alternatives on waste management," said Carolyn Oldfield, coordinator for the Thoroughbred Resource Conservation and Development Council, a charitable organization that focuses on projects relating to agriculture and conservation in seven Kentucky counties, including the prime Thoroughbred producing areas. "We have been working on handling equine waste for several years, and composting seems to be a win-win situation.

"This all started with a little project ten years ago funded by the Environmental Protection Agency. Airdrie Stud was the first demonstration farm," said Oldfield, who is employed by the U.S. Department of Agriculture's Natural Resources Conservation Service.

"A lot of people were cautious then because of the time involved. Horse farmers are in the business of breeding horses, not composting. This was something different, and we had a learning curve. Now, to see so many people buying into this idea is very exciting."

Benefits of composting

Spreading raw muck on pastures introduces pathogens and weed seeds, and having muck hauled away is an unending expense. Composting avoids these problems, while at the same time increasing overall pasture health and soil quality.

The cost for fertilizer often is reduced when farms compost, with the amount of savings depending on several factors. Weed growth also is suppressed, which can reduce or eliminate the need for treating fields with herbicides.

"We actually have some farms that have been able to stop fertilizing since they've been composting," Oldfield said.

She adds that another huge benefit to composting is volume reduction. Typically, what was four wagon loads of muck will become one load of compost—a 75% reduction in volume.

In addition to these benefits, land owners in Kentucky interested in dealing with equine waste in more efficient ways also may qualify for financial assistance. Assisted in part by the Kentucky Agriculture Development Fund, a cost-share program has been established for waste management, including composting and muck pits for manure storage, Oldfield said. "2006 was the first year funding was offered for composting," she said.

The state cost-share program can provide 75% of the total cost for an all-weather pad for your composting site, if such a pad is necessary. Local conservation districts are accepting requests for cost-share funding under the Kentucky Soil and Water Cost-Share Program. The sign-up period for this opportunity runs through February 28. Contact your local USDA service center to apply. Priority is given to animal waste-related problems.

The Thoroughbred Resource Conservation and Development Council works with farms and can develop a compost-site plan, taking into consideration the volume and type of bedding, and then creating the compost recipe that will work best for your specific conditions.

"Right now, we are charging $600 to lease a compost turner per month. A compost cycle is generally two to three months," Oldfield said. "That allows people to experiment with it before making the investment of buying one. The turners cost about $12,000 to $24,000, depending on the size. It's a specialized piece of equipment; you can't just go down to the local farm supply store and buy one."

What is involved

If you are considering composting, one of the first things to consider is an appropriate site. Ideally, it will be easily accessible and on higher ground, away from streams and sinkholes, and with a slight (1% to 3%) slope, said Dawn Angarone, a compost expert and technician who works with the Development Council part time. Angarone develops site plans for farms interested in composting and is an instructor at compost workshops.

When considering a site, there should be enough room for a tractor and equipment to maneuver easily around rows of muck. There needs to be a 100-foot grass filter strip to treat run-off. Also consider additional buffer zones for property lines.

Using a tractor and manure spreader, muck is laid out in rows, or windrows, about ten feet wide by four feet high.

"Build rows with the slope of the land [not with the contour] so rain runs down the slope between the rows, rather than into the side of the rows," Angarone said.

The windrows of muck can sit for a short time until you have enough to start the compost cycle, which begins when you turn the windrows for the first time. But before you start, you need a recipe for your compost. Because bedding varies, you need a balanced recipe to successfully turn the muck into finished compost.

"Materials need a blend of nitrogen, carbon, air, and water that, when mixed, provide a heat cycle to kill weed seeds and pathogens," Angarone said. "Talk to the [Development Council] before you start composting for help with your recipe."

"Basically, any carbon-nitrogen source can be composted," Oldfield said. "The key is determining the correct recipe. Shavings and woodchips will take a little longer in the cycle. Combining beef cattle manure and horse muck works well together."

You will need a tractor [70 to 90 horsepower] with a slow creeper gear and a compost turner. Creeper gears can be added to some tractors, depending on model. Individuals looking to do that should check the manufacturer's website.

Although the turner is the only specialized piece of equipment needed, the price, depending on size, can be prohibitive for smaller farms, so leasing can be a huge advantage.

Depending on the size of the operation and the amount of muck generated, an all-weather pad may be necessary to stabilize the ground in the compost area, but long-term financial benefits can definitely justify the initial investment.

Time required

"Plan your schedule ahead to dedicate time for turning," Angarone said. "The majority of turning is done in the first two weeks."

Turning aerates the material, adding oxygen to continue the composting process.

The windrows of muck may need to be turned two to four times during that first week alone. The number of turns depends on the temperatures of the material and the type of bedding. You will need a heavy-duty dial thermometer that is made for outdoor use and strong enough not to bend, with a shaft of about three-eighths-inch diameter, explained Angarone.

"The heat core in a compost row is 18 to 24 inches into the center, which means you need a thermometer 24 to 36 inches in length. Compost thermometers are readily available online from several companies; *Reotemp.com* is a good source. You can buy a 36" heavy-duty dial thermometer for about $120," she said.

Once the temperatures in the windrows reach 140° to 150°, the material runs out of oxygen. By turning the material, you add more oxygen, and the cycle continues as it heats up again. Time and labor is involved in monitoring the material, taking temperatures, and slowly turning the rows when necessary.

Interestingly, when composting is done correctly, it is not an odorous undertaking. If things begin to get stinky, something is wrong.

"Odor can be caused by improper drainage or a slope where standing water can collect," Angarone said. "Improper placement of rows where water collects at the base and under the row also can cause odor. She added that it also can be caused if you use an out-of-balance recipe where the materials are too dense, there is a lim-

ited natural air flow, or the material composition is too high in nitrogen.

Once the composting process begins, it typically takes eight to ten weeks to turn muck into finished compost. Finished compost does not smell like manure, but simply smells earthy.

Composting in action

Lantern Hill Farm, a 184-acre farm located in Midway, Kentucky, just completed its first full year of composting.

"There aren't very many places to dispose of manure anymore," said Lantern Hill owner Suzi Shoemaker. "We had been using a farmer's land adjacent to our farm, and it's no longer available to use; land values have gotten so high. We felt we had to come up with a new way of dealing with the disposal issue. We didn't think herd-management-wise it was good to spread raw muck on our pastures, and it's very expensive to have it hauled off."

Shoemaker asked the Development Council to create a composting plan for her operation, based on the amount of bedding they use per year. The farm also leased a compost turner from the Development Council, which was a very cost-effective way to get started, she said.

"They recommended three acres for a composting site, and we leased adjacent land for the first year," Shoemaker said. "Once we found we were able to manage it with our machinery and help, we've since fenced off a dedicated three-acre plot on the main farm and consider it very well used. It's saved us money because we don't have to pay to have the muck hauled off."

Shoemaker said the biggest challenge was finding a tractor with a creeper gear; she eventually bought a kit for the farm's John Deere to retrofit it.

Lantern Hill uses mostly straw bedding, approximately 90%, and occasionally uses wood shavings. Shoemaker plans to continue the composting program.

"It's really the only answer for us," she said. "Water quality is an issue everywhere you turn. We felt this was the only adequate way to address those water quality issues. Also, the product we get is really high-quality and we're putting it back on the land. I'm very much in favor of this program."

Shoemaker admits that composting takes more time and dedication than sending an employee out with the tractor and manure spreader.

"You need a very dedicated crew because you've got to take temperatures, and there are turning cycles," she said. "The temperatures are crucial to sterilizing the material. Our farm manager takes temps and tells employees when to turn the compost. A lot of things need to be done properly or it won't work."

Contract labor a help

Three Chimneys Farm, which covers about 2,000 acres in Midway, Kentucky, uses straw for bedding and has been composting its muck for about four years.

"It is the right thing to do environmentally," said Dan Rosenberg, Three Chimneys president. "We're improving our pastures and saving money. It costs us less than having the muck hauled off, and we have the added benefit of putting the compost back on our land. It's working fantastic."

Because composting requires dedicated labor at certain times, as well as specialized equipment, Three Chimneys decided to contract with an independent company to handle the dirty work, so to speak.

"Equine Muck Management handles this for us," Rosenberg said. "They contract with a number of farms and move their equipment from site to site. We have two different composting sites. We dump the muck; they compost it and spread it. We're doing this for about three-fourths of what it costs to have it hauled away."

Rosenberg does not think spreading raw manure on pastures is a smart management practice.

"It leads to parasite and weed problems, and just stockpiling manure without composting it obviously contaminates ground water," he said. "Composting is the right thing to do. I have no doubt that the day is coming when the EPA will tell us we have no choice. We wanted to get ahead of the curve."

Ron Wallace's Equine Muck Management business is based in Woodford County, Kentucky. Using its own equipment—tractor, front-end loader, compost turner, and spreader—the company does on-site composting for farms in the area. The farm provides the composting site, which generally requires two to four acres, depending on how much muck is produced. Wallace's crew then comes in and handles the actual composting process.

"We mostly do straw and bluegrass hay bedding but can also handle shavings and sawdust," said Wallace, adding that the finished compost turns out the same, although shavings take a bit longer to break down.

"We usually stockpile the muck, windrow it, and make rows about five feet high and ten feet wide," Wallace noted. "We usually add dirt to get the [composting] process started. Then once we get it going, we can just hold back some end product and mix it with new muck. What you end up with looks just like top soil you'd buy. Then we spread that back on the fields and put it around trees. The final composted product is 20% to 30% of the original muck."

Getting started

Oldfield does not mind that some people refer to her as the compost queen.

She loves working with farmers and has high hopes that in the future the Kentucky horse area will supply compost for commercial sale.

"Before I retire, I'd like to see this happen," she said. "With the population base we have, I don't think this would be a problem at all. I'd like to see beef and horse farmers be able to make money doing this. If farmers are making money, that's the best way to save farm land."

Land owners interested in composting should contact the USDA Natural Resources Conservation Services office in their area. Interested Kentucky farm owners should contact their local resource conservation and development council and conservation district offices for details about the cost-share program. For more information, e-mail Oldfield at carolyn.oldfield@ky.usda.gov or call (502) 863-6010, extension #4. Those interested also may call the same number for information about a composting workshop scheduled for March 31 at WinStar Farm in Versilles, Kentucky.

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