Owner's Report On Compost Turners

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windrows every day for the first week, then two to three times during the second week. It takes 6 to 8 weeks to turn raw manure into compost.

"We make compost during the summer when we're not as busy and spread it only during the winter in order to reduce soil compaction. The compost can be sticky and may tend to bind up on the bottom and sides of a spreader. We found that a conventional box spreader works best, but it should have a plastic bottom and sides.

"Composting has a lot of advantages for us. It reduces the volume of material that we have to spread by half and results in a high humus soil with minimal nutrient loss. Already we've been able to reduce the amount of commercial fertilizer we buy, and we hope that eventually we won't need to buy any at all. The compost contains a lot of bacteria that enhances the soil and it kills weed seeds and pathogens. It also greatly reduces groundwater pollution. Composting takes a lot of work, but because of all the advantages we think it's worth it.

"We're also planning on other uses for the aerator. We may use it next spring to help dry out manure inside the feedlot, and we can use it during the winter to move snow."

George T. Jones, Florence, Ala.: A retired chemist for the Tennessee Valley Authority (TVA), George and his colleagues used a **Scat Engineering** 10-ft. windrow turner for four years, 1993 through 1997, at a TVA facility at Muscle Shoals, Ala. They were conducting research aimed at developing an odorless pelletized fertilizer out of manure from local chicken farms.

"It was an excellent piece of equipment," he says about the turner. "It did an exceptional job of mixing and chewing the material down."

Poultry manure, along with sawdust, was composted in a 100 by 800-ft. research site, in 100-ft. long windrows. Batches of 400 to 600 tons of compost were produced at a time.

"Composting is suitable anywhere you've got a material like manure with an odor. Manures are going to have to be recylced and this is an excellent way to do that," he says. "It's an ideal product for the home gardening and golf course markets. It's not economically feasible for large-scale agricultural use since it costs at least $10 per ton to produce."

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Larry Hostetler, Otterville, Mo.: Larry uses a 1997 **Aeromaster** PT-120 12-ft. turner in his commercial composting/turkey farming operation. It's equipped with an optional grid flex mechanism connecting the drive line to the gearbox and a driveline transfer box on front, all to reduce stress on the driveshaft.

"It's the only turner on the market that takes CO2 out of the pile because of its drum design. I couldn't be happier," says Hostetler who's also a sales rep for the manufacturer.

Hostetler produces 450 tons of compost a year by mixing manure from his 65,000-bird turkey operation with crop residue. He uses some on his gardens and hay fields and sells the rest for $100 to $120 per ton (FOB Otterville). He makes compost in 9 1/2 by 4-ft. windrows in a 100 by 160-ft. all-weather gravel pad with 3 degree slope.

He says his motivation for composting is simple: "Increasing fertility in the soil.

"Composting eliminates the possibility of surface and ground water pollution from leachate because the material is stable," he says. "For anyone with a waste stream, organic farmers, or specialty crop growers, it's cost-effective."

Dan Young, Union City, Ohio: "We've had no downtime whatsoever with this machine since we bought it four years ago," says Dan, pleased with his 1994 **Sandberger** ST-300 10-ft. turner. It's equipped with an optional watering manifold and nozzles and adjustable sub-frame so the machine can be raised or lowered for working on uneven sites.

"We decided five years ago to put our money into composting to improve our soil," he says. "In that time, we've more than doubled our calcium levels and nearly doubled our phosphorous levels. So it's definitely been cost-effective for us."

The operation, which requires three hours a day, six days a week from March through October, produces 700 to 1,500 tons of compost a year from livestock manure collected from a two to three-county area as well as beef and chicken manure from Young's farm. The compost that isn't used on Young's organically grown grains and vegetables is sold for $65 to $80 per ton.

"I'd highly recommend composting for anyone with livestock or who grows vegetable crops," he says.

Judy Fancy, Northfield, Nova Scotia: Judy started composting chicken manure and big round straw bales from nearby farmers three years ago, with the aim of producing 2,000 to 3,000 lbs. of white button mushrooms a month in three 26 by 40-ft. buildings.

Fancy Fine Mushrooms and Compost has been producing 50 tons of compost a year using a 510 **Sittler** 12-ft. wide turner bought new in 1995 and pulled with a Belarus 5450 65 hp tractor. The turner is equipped with an optional hydraulic package that moves the body of the machine in and out to make straight windrows of a uniform width.

"It's an excellent machine that aerates our 6-ft. wide by 4-ft. high windrows well," Judy says. "The only change I'd like to see is to make it handle 6-ft. high windrows, since 4 ft. is a little short for our liking."

Fancy sells her compost, which is made on well-drained gravel, for $60 per cu. yd.

Ray Johnston, Commanche, Texas: Ray started composting manure and bedding from his 1,600-cow dairy three years ago when he added two free-stall barns. He has a 1996 12-ft. EarthSaver from **Fuel Harvesters Equipment**, which he pulls with a Deere 7800 with creeper gear.

"We use it four or five days a week and the drum does an excellent job of turning and aerating windrows. It mixes compost with a shuffling action like a deck of cards. The only problem I ever had was with the hydraulic pump. It was a design problem that company reps came out and identified. They not only fixed my machine but modified the design on all subsequent machines by adding a brake."

Johnston Dairy makes 10,000 to 15,000 tons of compost a year in 12 by 4-ft. windrows on two leveled dirt pads totaling 20 acres. Most of the compost is used on the dairy's 1,500 acres of grass and corn silage. The rest is sold.

"The main reason we're composting is that it's more asthetically pleasing to the neighbors," says Ray. "We're still on the low end of the learning curve, but we have discovered a few things already. For example, it gives us more mobility and much less volume than raw manure.

"It's not at all cost-effective but is more acceptable to the neighbors and more environmentally friendly than spreading raw manure out on fields, as we used to do. The regulators like it more.

"It's possible all confinement agriculture may have to look at composting someday. We may all have to do some things that are not cost-effective just to stay in business."

Tom Beck, Christensen Cattle Co., Fullerton, Neb.: This large cattle operation uses a combination of in-pen drying and off-site composting. They also incorporate green yard waste from the city of Fullerton. The yard waste, a high-carbon source, has increased the windrow temperature by 30 degrees. Their **Brown Bear** aerator makes 4 to 5-ft. high windrows.

"We also use the aerator to break the crust in our feedlots, exposing the wet material to the sun for rapid drying. Without the aid of the aerator this material would never dry," says Beck.

Liquid hog manure is applied to windrows by Illinois State University researchers with a modified Balzer honey wagon.

They're Using Liquid Hog Manure As Compost Wetting Agent

Composting is an efficient way of disposing of solid livestock manure. But what about liquid manure?

One researcher says it can be used as a wetting agent for solids in place of water.

Paul Walker is an animal scientist at Illinois State University in Normal, Ill. For two years, Walker and his associates have been experimenting with applying liquid hog manure to composted yard waste and solid beef and dairy manure.

"It takes management and a little extra time because you have to haul and turn, haul and turn, but it looks like a very effective 'low odor' way of disposing of the liquid," Walker says.

To apply the liquid evenly to the university's 5-ft. wide by 4 to 5-ft. tall windrows, the researchers modified a conventional 2,250-gal. Balzer honey wagon equipped with rear discharge and front suction fill.

"We installed a 4-in. dia. hydraulic discharge valve on the suction pump and fitted the end of the valve with a shroud we built out of sheet metal," Walker says. "That's to keep the liquid within the 5-ft. area of the windrow instead of spraying out beyond it."

Rates average 1.35 lbs. of liquid manure to 1 lb. of compost, or 498 lbs. to the cu. yd., Walker says.

"In summer we use it as a wetting agent, typically applying it once a week," he says. "In fall and winter we add just enough liquid to keep our carbon-nitrogen ratio at the desired 25 to 30 to 1 level.

"We've learned you can apply only so much liquid before you have to turn the windrow. Otherwise, it saturates the outside of the pile and rolls off. Also, if it's not turned within 12 hours, it'll stink to high heaven. But there's nothing more than the normal compost odor once you've incorporated it."

During the first nine months of the experiment, the researchers applied 2,800 tons of liquid manure to 2,080 tons of compost, which produced a final total of 2,250 tons of compost. It was used as agricultural fertilizer on the university's fields at rates of up to 60 tons per acre.

"It's all based on science, but there's a certain amount of art involved, too," Walker says. "For example, how do you manage during less-than-ideal conditions like the tremendously wet weather we've been having lately?"

An economic analysis of the practice is just beginning, he says.

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