A compost turner suited to you

Do your homework before investing in equipment to manage your manure composting operation

By Jean Bonhotal

Don’t rush out and invest money in equipment to manage compost. Take some time to evaluate several factors, starting with the basic question: Does composting fit into your dairy operation, your time and your labor? Also answer:

1. How much space can you dedicate to composting? What size compost pad will you need? If space is tight, you can build windrows 5 to 7 feet tall, though the type of turner dictates height and width. With larger windrows, you’ll have fewer piles to manage, use less space and take less time turning. Larger windrows are also more forgiving in cold climates; size insulates the pile and keeps it active through cold weather. If space and time aren’t as critical, you can build shorter windrows and turn them with equipment geared to their size.

2. What type of feedstock do you plan to use? And how dense is it? How much organic material will you manage? Will it be farm-generated or imported manure, food processing residual, animal bedding or wood products? Some feedstock is difficult to manage and takes longer to compost and cure than other types. Experiment with different recipes.

3. What is your area’s climate – relative humidity, snowfall, temperature and rainfall? Sometimes precipitation and relative humidity enhance the process and sometimes hinder it.

4. How aggressively will you manage the compost process?

5. Can you manage compost with existing tractors, loader or even a pitchfork? Experiment with different equipment.

6. Can you rent equipment initially, especially when you’re considering screening, bagging or collecting organics? Renting equipment with an option to own may save you money.

7. What equipment will you use often and what intermittently? You might use a turner, for example, weekly, nine months a year. But screens and size reduction equipment are generally used less frequently, and it may not be worth the maintenance and storage costs to own such equipment.

8. Can you share equipment with another compost business? In small compost operations it may be more economical to share turning and screening equipment, or to pay someone to do those jobs.

Turning equipment

Since turning equipment gets the most use in composting, it’s important to pick the size and type of turner to fit your operation. Consider the amount of use, climate fluctuations and labor availability. Then evaluate the following types of turners:

1. Front-end loader. They’re good all-purpose equipment that can mix and move compost – lifting and dropping it back in place, stacking it to form new windrows and loading compost into trucks. Dedicated pieces of equipment aren’t as versatile.

   If you’re buying a loader, make sure it will grow with your plans. Get the size bucket for the volume of material you’ll handle and for the type of composting. Will you use the loader in a building or large container-type compost system?

Photo credit: Eleanor Jacobs.

The pull-behind Sandburger straddle turner works well on smaller windrows. Photos by Eleanor Jacobs.
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Some composters attach forks to loader buckets to incorporate more air and fluff the material.

- **Mixers and manure spreaders.** These can mix materials and form windrows. Pulling a flail spreader slowly allows you to pile compost material into a rough windrow. Auger-type spreaders unload out the back or side and, by moving the spreader slowly, will form windrows that generally aren’t very tall.

- **Windrow turner.** This dedicated piece of equipment can mix compost, reduce particle size and homogenize organic material. Most turner manufacturers sell accessories such as water or inoculant tanks, rock guards and attachments to manage compost covers.

- **Push-type self-powered rotary drum and tow-behind PTO-powered turner.** These smaller turners are pushed or pulled through windrows while their rotating drum mixes and aerates compost. They’re designed to track on the right or left side of the windrow. You’ll need enough space between the rows for the tractor, which should have a creeper gear or hydrostatic drive.

- **Auger-type turner.** The auger is in a bucket and can, in some designs, move the whole windrow to the side. These turners, which come in different sizes, break up piles with each turn.

- **Elevating face conveyor.** Either self-propelled or PTO-driven, this turner lifts the compost up its face and drops it off the back into the windrow. With each pass, the whole windrow is picked up and moved a few feet, allowing for good aeration and mixing. Piles can be stacked 12 to 14 feet wide because you can turn one side then the other.

- **Self-propelled straddle turner.** It can turn piles from 5 to 7 feet tall, making this turner generally best suited for compost facilities with five or more acres of windrows to turn. A rotating drum shaft combined with hammers or flails reduces material size and aerates and mixes windrows.

  Drums on some turners can be moved vertically, allowing operators to control the turning distance to the pad surface. This is effective if you have to turn heavy feedstock or incorporate additional bulking material laid as a base prior to pile construction.

- **Rotating drum system.** Material is fed in at one end and moves through horizontal cylinders that aerates the compost through mixing and/or forced air. The immature compost is continuously pushed out of the drum and stacked in windrows to process.

- **In-vessel systems.** These run the gamut from low-technology containers to totally controlled systems inside buildings. Some examples include boxes with aeration, long cement bays, tunnels and beds, with options of passive aeration, forced air and/or turning windrows on timed intervals.

  Containment reduces weather’s impact on the compost, controls some odor and air emissions, and may provide better control of temperature and aeration.