

# Composting Horse Manure

Composting is an economical and efficient method for managing equine manure

## Overview

Efficiently managing manure is an important aspect of caring for horses. Storing fecal matter is unsightly, malodorous, attracts flies, takes up valuable space, can pollute nearby stream and ponds, and is typically costly to remove from the farm. Composting is a viable option for virtually any equine operation, regardless of size.

By definition, composting is the controlled breakdown of organic material (i.e., carbohydrates, fat, proteins) to produce a humus-rich product that is suitable for growing plants. While composting relies on microorganisms to convert manure and other organic products—such as bedding, leaves, and grass clippings—when done properly, the final product is free of pathogens and weed seeds.<sup>1</sup> Composting is an active process requiring oxygen (aeration), heating to proper temperatures, moisture control, and a balanced carbon to nitrogen (C:N) ratio.<sup>1</sup> Specifically:

- The moisture content should be approximately 50-60%, which means that it should feel like a damp sponge, but void of water drops;
- Oxygen is critical to support aerobic, rather than anaerobic, microbes to break down organic material. Mix manure with lawn clippings, leaves, or hay to improve potential oxygen in the compost pile; insert a perforated PVC pipe into the pile to help provide oxygen; or use an electrical blower designed to force air into the pile to ensure proper and quicker composting;
- Compost for agricultural use, referred to as thermophilic composting, is produced at temperatures between 115°F and 160°F; and
- Carbon and nitrogen are nutrients required by microbes during composting. An optimal C:N ratio is 25:1 to 30:1. While supplemental nitrogen might be required, equine manure in wood shavings is generally well-balanced.



Using appropriate composting areas that allow the pile to be turned and managed with machinery makes the composting of horse manure a much easier job.

## The “Ins” and “Outs” of Composting

Each composting program is farm-specific and depends on space available, equipment (e.g., accessibility of a front-end loader), and the number of horses contributing to the pile. The main factors that need to be considered are the location, number, and type of compost bins that are required.<sup>2</sup> A well-located, aesthetically pleasing, organized composting system is more likely to be used appropriately, particularly on farms where multiple individuals are mucking stalls.

**Location** An ideal location for composting bins is on a high, level area convenient to access (so the time and energy needed to clean stalls is not negatively impacted). Bins in low-lying areas will collect too much water. Composting bins should also be installed a considerable distance from creeks, ditches, and other bodies of water.<sup>2,3</sup>

**Number** In general, two bins are required for composting, and for many operations either a three-bin or six-bin system is used.

In the three-bin system, one bin is actively being added to, one bin is full and

composting, and one bin contains the mature compost that is ready to be used.

**Types** There are a myriad of options regarding bin type and methods.<sup>2</sup> Some examples include landscape timber compost bins, wooden, three-bin turning units, wood and wire three-bin turning units, concrete block composting bins, and wooden pallet or snow fencing holding units.

To improve composting speed and efficiency and minimize the need to turn the compost pile, mechanically aerated composting systems are available. These composting systems use an electric blower to force air through the pile, thereby keeping oxygen levels high enough for composting to take place. In one system a timer operates the blower so it cycles on intermittently. The blower cycles this way 24/7, and within 21-30 days, the primary phase of composting is nearly complete.<sup>4</sup>

Equipment needed for composting includes a compost thermometer; a tarp to cover the bins; pitchforks, shovels, and wheelbarrows—or a tractor with a front-end loader if you need to turn the composte

pile at regular intervals.

### Assessing Compost Maturity

One of the easier and more economic (yet not completely reliable) approaches to determine when the compost is mature (i.e., completely degraded) is temperature monitoring. Temperatures in fresh compost rise quickly to approximately 160°F, then decrease slowly to near-ambient temperatures while the compost matures. If after aerating, turning, or wetting the compost the temperature increases, the compost is likely not yet mature. A second method to test maturity is to measure oxygen consumption and/or carbon dioxide production. If oxygen consumption (indicating aerobic bacterial activity) is below a certain threshold value, the compost is considered mature. Commercial tests for compost maturity are available.

Properly prepared compost created on-site can be spread on pastures or cropland or given away. Unless high-quality compost is specifically produced using established guidelines, selling compost is generally not an option.<sup>5</sup> Instead, experts suggest advertising free compost on specific dates

and times and encouraging prospective consumers to bring their own shovels and buckets for transporting the compost.

### The Importance of Proper Composting

Compost quality is important, particularly if it is to be used on paddocks. For example, horse manure needs to be “cooked” for a specific length of time and at high enough temperatures to result in sufficient reductions in viability of roundworm (*Parascaris equorum*) eggs and *Rhodococcus equi* populations. *R. equi* and *P. equorum* eggs are both very hardy and can potentially remain infective for years on pastures and in compost.<sup>6</sup>

Note that compost can catch fire if it reaches temperatures higher than 172°F and is stacked in large, unmanaged piles for long periods of time. Monitoring compost temperature and ensuring compost bins are not next to any structure that can burn is imperative.<sup>5</sup>

### Additional Resources

General information and resources to assist in designing a composting system to best meet your farm's needs is available

from TheHorse.com/6631. More information on initiating a composting program can also be obtained from local agriculture extension specialists and private consultants. Check with the township or municipality to determine guidelines/regulations regarding composting prior to commencing. Extension specialists might also have information on how to obtain grants to help offset the cost of initiating an on-farm composting program. 🐾

### KEY REFERENCES

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Authored by Stacey Oke, DVM, MSc;  
reviewed by Fairfield T. Bain, DVM, Dipl. ACVIM, ACVP, ACVECC.

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