A Guide to Composting Horse Manure

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How to Make Compost Happen

There are several key factors in having a successful compost pile and how well you manage each one will have an effect on how quickly your manure composts.

Managing Air and Temperature

Build the optimum pile size. To achieve high enough composting temperatures to kill parasites, bacteria, and weed seeds, a pile must be at least three feet high. Otherwise, the heat generated in the initial stages will quickly dissipate before the pile can reach high enough temperatures. For best heating, try for a pile five to seven feet square on the bottom rising to three or four feet high.

Maintain airflow through the pile. After a pile is formed, keeping air in the pile is critical to prevent odors, achieve high temperatures, and to complete the composting process in a relatively short amount of time. If you have a tractor, turning the pile at regular intervals, especially during the first few weeks after building the pile, will speed up the decomposition process considerably. In general, the more often you are able to turn the pile, the faster it will decompose. Turning will not only help allow air to reach all areas of the pile, it will also ensure that material on the outside of the pile is turned to the center where it can be subject to high temperatures where pathogens, fly larvae, and weed seeds are destroyed.

If you are not able to turn the pile with a tractor, you can insert a couple of five-foot PVC pipes into the center of the pile like chimneys. Use a drill to put some holes into the pipes—approximately a half inch in diameter at six-inch intervals.

Another method of achieving airflow through the pile is the aerated static pile method described later in the Composting Methods section.

Monitor temperature. Temperature is an important indicator of how well the manure pile is composting. You can buy a long-stemmed compost thermometer at local nurseries or home and garden stores to monitor your compost piles. Most compost piles begin at a lower temperature range (about 50°F-110°F) then increase to the higher temperature range (110°F-160°F) and then gradually drop to ambient air temperatures over a period of several weeks. These high temperatures are necessary to speed up the rate of decomposition and to kill weed seeds and diseases. At least several days of temperatures between 135°F and 150°F are recommended. You also want to avoid overheating the pile, overheating can immobilize many of the beneficial organisms needed for decomposition. If you find your pile is reaching temperatures above 160°F, you may want to try reducing the size of your pile. Low outside temperatures during the winter months slow the decomposition process while warmer temperatures speed it up. On average, a well-managed pile can be composted in one or two months in the summer and three to six months in the winter.

Managing Moisture

Unsuccessful attempts at composting often result from a failure to maintain the proper moisture conditions. If there is too much water in the pile, the water will occupy the pore spaces needed for air to flow through the pile. Too much water also makes the pile heavy, increasing settling and compaction. When there is not adequate air in the pile it can lead to odors, slow the decomposition process, and make high temperatures impossible to achieve. On the other hand, too little moisture causes composting organisms to dry out which also prevents the pile from heating up.

Use the squeeze test. Take a handful of material from the interior of the pile (not just the outer shell) and give it a squeeze. A handful of material should feel damp like a wrung-out sponge, not dripping wet. If you pick up a handful of material and it drips without being squeezed, it is too wet. If the material appears dry and crumbles after squeezing, it is too dry. If the material retains its clumped shape after squeezing without releasing excess water and your hand is damp, then it is just right for composting.

Cover your pile(s). During our rainy season it is easy for an uncovered compost pile to become too soggy, inhibiting airflow. The end result is often a foul-smelling pile that is very slow to compost. Covering your compost pile allows you to regulate the amount of water and will speed up the process by not letting it get too wet in the winter or too dry in the summer. It’s much easier to add water than it is to remove it. Covering your compost pile also limits fly breeding and keeps rain from washing nutrients out of the pile. Using a tarp is one of the easiest ways to cover a compost pile. Stapling or nailing a board across the front of the tarp can make it easier to pull the tarp forward and back. A permanent structure with a roof also works well, especially for larger horse farms with larger compost piles.

Add water when needed. Heat and airflow generated during composting can evaporate large amounts of water from a pile and you may find that your pile may get too dry in the summer. If you turn your compost pile, you can water it down with a garden hose when you’re turning it. Otherwise, you can water down wheelbarrow loads before adding them to the pile.

Choosing a good location for your compost pile(s). Select a level site that drains easily and that sits on
fairly high ground so the pile never sits in a pool of water. A dry level area is especially important when it comes to accessing the pile with any kind of heavy equipment (a tractor, truck, etc.). Equipment needs dry, level ground for turning around and positioning. Choosing a location for your compost pile that's convenient to your stall and paddock areas will make the chore of cleaning up easier and less time consuming. You'll also want to have the pile in an area that you can reach with a hose so that you can add water during those dry summer months.

A buffer zone is also required between your compost piles and nearby streams, ditches, wetlands, and residences. Contact your local Conservation District for more information.

**Turn to help dry out the pile.** If a pile becomes too moist you can help it dry out by increasing the turning frequency. Turning the pile can release significant amounts of water.

### Managing the Ingredients in the Pile

The organisms that do the decomposing in your compost pile need carbon for energy and nitrogen for growth. It's important to supply both kinds of materials in roughly the right proportions. The ideal carbon to nitrogen ratio for composting is between 25:1 and 30:1, with carbon being the higher number. High carbon materials are plant materials such as straw, wood chips, shavings, sawdust, and leaves. Materials that are high in nitrogen often include animal by-products like manure and blood meal but also includes grass clippings and hay. On its own, horse manure is about the ideal ratio. But if you add a lot of bedding to your compost pile, you can end up with too much carbon and not enough nitrogen.

When you have too much carbon (bedding) in the pile more time is needed to complete the composting process. The less bedding you put in the pile, the faster it is likely to compost. A manure pile with a lot of bedding is also less likely to compost completely. When added to the soil, high-carbon compost "robs" nitrogen from the soil to continue decomposition, making it unavailable to growing plants. When this occurs, the plants usually show a nitrogen deficiency as a yellowing of the leaves.

**Minimize bedding.** By minimizing the amount of bedding you use you'll save money and end up with a manure pile that composts faster. Most horses don't need as much bedding as is often used, they just need enough to soak up urine and moisture. When you clean stalls, try to remove only soiled bedding so that less bedding makes it into the compost pile. You may want to consider using rubber mats in stalls to provide the same amount of cushioning with less bedding. Rubber mats have other advantages also: they prevent horses from ingesting dirt or sand when eating off the stall floor, make stall cleaning easier, decrease dust, prevent a pawing horse from digging holes in the stall, and provide an even surface for horses to stand on (uneven surfaces may cause or exacerbate leg problems).

**Consider your bedding options.** Different types of bedding will decompose at different rates so which bedding you use will affect the speed of the composting process. Straw and shredded newspaper will compost faster than sawdust or shavings because they contain less carbon. There are also wood pellets on the market that are much more absorbent than straw or shavings-as a result, you end up using less bedding and less bedding ends up in the compost pile. These pellets are more absorbent because they go through a drying process that reduces the water content. They also break down into finer material that composts faster than shavings and that makes it easier to remove only soiled bedding when cleaning stalls.

**Add materials if necessary.** If you have too much bedding in your pile and want to help speed up the composting process, adding materials high in nitrogen like grass clippings, chicken manure, and blood meal can help.

### Composting Methods

[Whatcom County Agriculture Page](http://www.whatcomfarmers.org/countyag.htm) | [Whatcom County Home Page](http://www.whatcomfarmers.org/) | [Whatcom County Home Composting Page](http://www.whatcomfarmers.org/composting.htm)