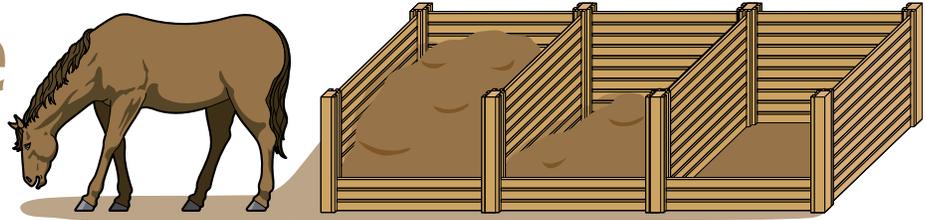


How to Compost and Use Horse Manure



If you care for horses on your own place then you have, no doubt, wondered about what to do with that huge mound of manure and stall waste generated by your horse. In fact, one horse can create a serious pile in no time – one horse produces about 50 pounds of manure per day, over eight tons per year. Add to that the eight to 10 gallons of urine a horse generates in one day and the wheelbarrow or more of bedding you use each day. You can see that in no time at all you will have a virtual manure mountain!

There are other concerns for the mismanaged manure pile as well. Horses allowed to graze near their own manure are quickly reinfested by larva that hatch from the worm eggs. Runoff from soggy manure piles can cause serious surface and ground water contamination problems. In many parts of the country there are ordinances that strictly control these issues. There may be associated odor and fly problems. If you live close to others, this may concern your neighbors as well.

Composting horse manure is an excellent manure management technique, especially useful for backyard or small farm owners. Larger horse facilities or those using equipment (tractors) to manage their composting process can also develop a composting system. Design help for larger operations and additional manure management assistance is available from your local conservation district. Individual consultants may also be able to help you assess your manure management options and resources.

The benefits of composting horse manure are many and include:

- Reducing the possibility of parasite reinfestation in your horse – the heat generated in the composting process kills worm eggs as well as pathogens and weed seeds.
- Reducing flies by eliminating their breeding ground.
- Reducing odors – a properly managed compost pile should smell “earthy” and pleasant.
- Reducing the volume of material you have piled up – the composting process will reduce the size of the pile by about 50% (this will take about three to four months).
- Providing you with a free, easy source of compost – a valuable soil amendment for your pastures, garden or yard. Your horseless neighbors may find it a valuable commodity as well!
- Reducing the chance of manure-contaminated runoff from your property reaching surface or ground waters in your area.
- Making your property more pleasing for you and your neighbors to look at and enjoy.

This handout will give you information on how to build and use a horse manure composting system that you can employ without the aid of a tractor. This system is designed for a backyard or small farm operation with one to five horses. You can tailor your composting system to meet your needs depending on how many horses you have, the amount and type of bedding material you use, and how you plan to use the finished compost. If you plan to use a tractor you will need a much sturdier design. Contact one of the resources agencies listed on the last page of this handout for additional design help.



King County

Department of
Natural Resources and Parks



Building a manure composting system

1. Select a site Look for a high, level area on your property – don't put your composter in a low-lying area or it will turn into a soggy mess. Remember you must locate your composter far away from creeks, ditches, wetlands or other waterbodies – you can check with local authorities for specific regulations on this. Choose an area according to your zoning regulations to avoid zoning issues or problems with neighbors. King County Code requires that manure storage be at least 35 feet from property boundaries. A location that's convenient to your stall and paddock areas will make the chore of cleaning up easier and less time consuming.

2. Figure out how many bins you need You will need at least two bins, maybe a third for convenience. A two-bin system works by piling manure and stall wastes in one bin. When that bin is full allow it to compost and start filling the second bin. Once the first bin is done composting you can start using the finished compost material. For convenience or if you have several horses you may want to consider going to three bins. This allows one bin for the daily stall wastes, another bin that is full and in the composting stage, and a third bin for the finished compost to be removed and used at your leisure. Check out the **Calculating your storage needs** section below for more information.

3. Purchase materials A list of materials and tools needed is included on the next page. It costs about \$200 per bin for materials depending on the type of wood you use and the cost in your area. Feel free to improvise and experiment by choosing materials available in your area, which will work for you and your situation.

4. Build the bins Using the drawings on the next page as a guide, one person can build this compost bin system in a weekend.

Calculating your storage needs



One adult horse produces between 16 and 30 cubic feet of manure per month

X

#

Number of horses

+

Volume of used bedding material (ft³) per month

=

Monthly compost bin space needed (in cubic feet)

The capacity of one 8 foot x 8 foot bin is 192 cubic feet if filled 3 feet high



Building the bins

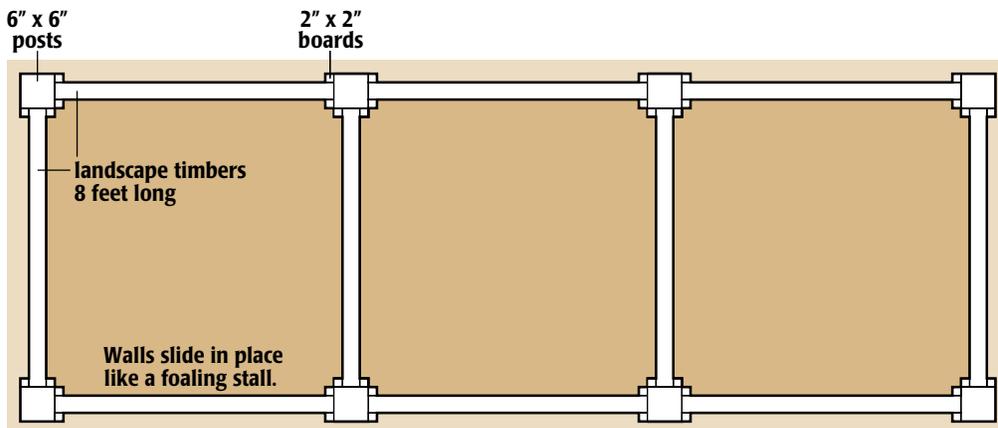
For three adjacent 8 foot x 8 foot x 4 foot bins, the following supplies and equipment are needed:

SUPPLIES

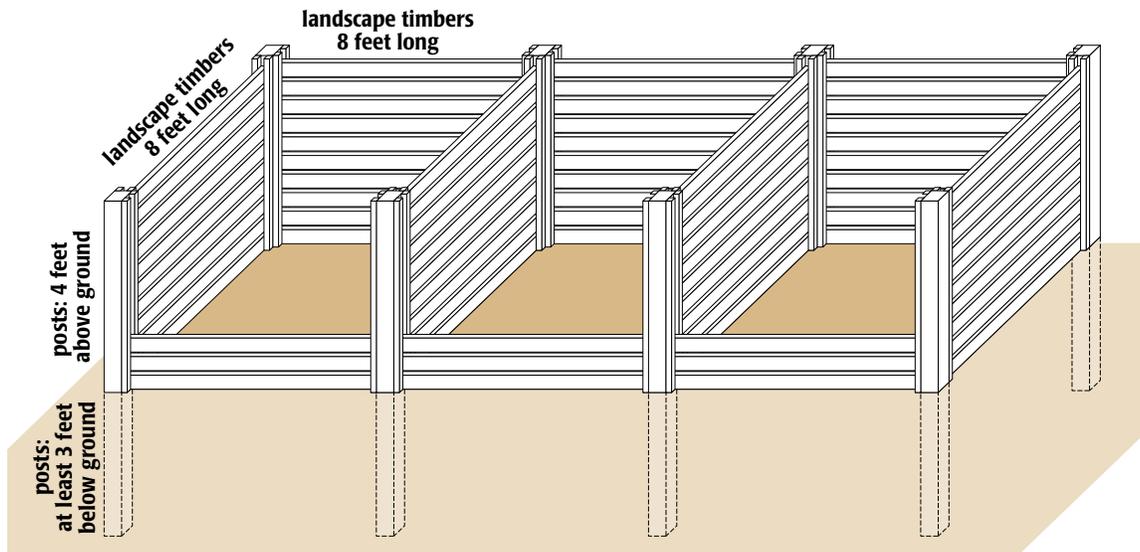
- 8 – 8' x 6" x 6" treated posts
- 40 – 4' x 2" x 2" treated boards
- 110 – 8' landscape timbers (or similar wood)
- 160 – 3" deck screws
- tarp (or plastic sheet) to cover top of each bin
- heavy items or straps to attach tarp to bins

EQUIPMENT

- drill with screwdriver head & drill bit
- 25' tape measure
- chain saw or hand saw
- carpenter's level
- post hole digger
- tamping rod or similar tool



Plan View



3-D View

NOTE: number of landscape timbers will depend on the type and width of the timbers you purchase and if you choose to make your bins shorter or taller.

How to use your new compost system

1. **Piling** Begin by piling the daily manure and stall wastes in one bin. When that bin is full leave it and start filling the second bin. And so on for the last bin. In two to four months the first bin should be finished done composting you can start using the compost from that bin.

2. **Cover your bins** This can be done with a tarp, plastic sheet or a roof. A cover of some sort will prevent your piles from becoming a soggy mess in the winter and dried out in the summer. Covering them also prevents the nutrients you're saving for the garden from being washed out into the surface water and causing other problems.

3. **Aeration** Turning the compost-to-be allows oxygen to get to the bacteria and organisms that break down the material into dirt-like structures. This keeps the process aerobic, an "earthy" smelling process. If the compost becomes anaerobic (without air) it will have a foul, undesirable odor. How often you turn it determines how quickly your compost will be ready. However, unless you have access to a small tractor or enjoy a good workout, turning the pile can be difficult. Air will permeate through the pile to a depth of about two feet. An easy way to get air to the center and avoid turning the pile as frequently is to insert a couple of five-foot PVC pipes into the center of the pile. Use a drill to put holes along pipes. The pile will still need to be turned occasionally to get the manure on the outside into the center so the heat from the composting process can kill parasites and weeds.

4. **Water** Your compost material should be about as damp as a rung out sponge. In the summer, water your compost with a garden hose when you turn it. An easy way to add water is just to hose down the manure in your wheelbarrow before you dump it in the pile.

5. **Finished compost** If you follow the guidelines listed here, your compost could be ready in as soon as one month! However, depending how often you turn it and whether it stays damp, it will probably take between two to four months to finish, perhaps slightly longer in the winter. You will know when your compost is ready when the material looks evenly textured and crumbly like dirt and no longer like the original material. You can expect the volume of the finished compost to be about half the volume of the original materials.

6. **Uses for compost** Compost is a rich soil enhancement that improves the health of both plants and soil and helps to retain moisture. Spread compost in pastures during the growing season no more than a half inch layer at a time and 3 to 4 inches per season. It can be also added to the soil of houseplants, gardens or flowerbeds—or shared with horseless neighbors. Each cubic foot of finished compost will cover about 24 square feet at half an inch thickness.

Additional resources about composting horse manure

- **Horses for Clean Water:** A program run and supported by horse owners promoting environmentally sensitive horsekeeping which offers classes, workshops and farm tours on topics such as mud, manure and pasture management, composting, wildlife enhancement, horse health, preparing your horse farm for winter, and more! HCW also offers educational materials and products for sale and individual farm consultations. For more on HCW educational opportunities, or to be on the listserv to receive information about future educational events contact Program Director Alayne Blickle at 425-432-6116 or alayne@horsesforcleanwater.com. Visit the HCW Web site at www.horsesforcleanwater.com to view the archives of The Green Horse, as well as to sign up to have it delivered directly to your e-mail inbox every month.
- **King Conservation District:** A local agency which works with farmers and livestock owners, often for smaller, non-commercial places on similar land management practices relating to wise use of the natural resources, such as pasture, manure and mud management. The King Conservation District can be reached at 425-282-1900 or you can visit their Web site at www.kingcd.org.
- **King County Livestock Program:** For more information on livestock, zoning regulations and manure management details contact the King County Livestock Program at 206-263-6566. This program supports the raising and keeping of livestock in King County by overseeing the implementation of the Livestock Management Ordinance. It also promotes education related to livestock best management practices and provides cost sharing for farm plan installation.
- **Natural Resources Conservation Service (NRCS)** works with farmers and ranchers on issues relating to wise use of the natural resources, such as pasture, manure and mud management. You can reach the NRCS Renton Field Office at 425-277-5580.
- **WSU Extension King County:** Contact your county extension office to get more information on gardening and tools for resourceful living, as well as composting. They can be reached at 206-205-3100 or you can visit their Web site at www.king.wsu.edu.
- **Garden Hotline:** For general composting questions, call or e-mail the Garden Hotline at 206-633-0224 or help@gardenhotline.org. You can visit the Web site at www.gardenhotline.org.
- **Horsekeeping on a Small Acreage (2005 revised & updated edition)**, by Cherry Hill. An excellent reference book on horse facility design and management. Includes information on understanding horses, designing a horse facility for your land, and general considerations as well as designs for horse barns and other facilities.
- **Many books are available in the library** on composting. A good source for information on agricultural composting is the On-Farm Composting Handbook, distributed by Natural Resource Agriculture and Engineering Service, PO Box 4557, Ithaca, NY 14852-4557. Phone: 607-255-7654, Fax: 607-254-8770 or e-mail: NRAES@cornell.edu.

Troubleshooting the Compost Process

SYMPTOM	PROBLEM	SOLUTION
The compost has a bad odor.	Not enough air	Turn the pile, add more PVC pipes.
The compost has a bad odor and is soggy.	Not enough air and/or too wet	Mix in dry ingredients like straw or shavings, add PVC pipes and cover with a tarp.
The inside of the pile is dry.	Not enough water	Add water when turning the pile. Should be as damp as a wrung out sponge.
The compost is damp and warm in the middle, but nowhere else.	Pile is too small	Collect more raw material and mix it into the old ingredients. Piles smaller than 3 feet square have trouble holding heat.
Pile is damp and smells fine, but is not heating up.	Too many shavings, wood chips or bedding (carbon source) and not enough manure (nitrogen source)	Mix in a nitrogen source (straight manure, fresh grass clippings, blood meal or ammonium sulfate).

Alayne Renee Blickle, a life-long equestrian and reining competitor, is the creator/director of **Horses for Clean Water**. As an environmental educator, Alayne has been working with horse and livestock owners as well as writing for national and regional horse publications for over 15 years. She works with natural resource agencies, horse groups and individuals across the county. Visit the Web site at www.HorsesforCleanWater.com.

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Alternative formats available. Call 206-296-6519 or TTY: 711.

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