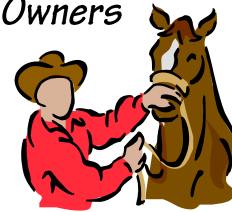




How to Compost and Use Horse Manure

A Step-By-Step Guide for Horse Owners

By Alayne Blicke, *Horses for Clean Water*



If you care for horses on your own place then you have, no doubt, wondered what to do with that huge mound of manure and stall waste. After all, the average horse produces about 50 pounds of manure each day (up to 8 tons per year!) and 8 to 10 daily gallons of urine. Add to that the wheelbarrow or more of bedding used each day and you can envision yourself quickly becoming buried in a virtual mountain of manure and waste!

Aside from the obvious issues (odor, flies, neighborly eyesore, etc.), other less obvious concerns can also arise from a mismanaged manure pile. For example, did you know that horses that are allowed to graze near their own manure can become quickly re-infested by larva that hatch from the worm eggs? Were you aware that runoff from soggy manure piles can cause serious surface and ground water contamination problems? This can not only affect your relationships with your neighbors, but can also cause serious health concerns for your family and community.

Composting horse manure is an excellent manure management technique. This handout will provide essential steps for building and using a horse manure composting system that can be managed without the aid of a tractor. This particular system is intended for backyard or small farm ("ranchette") operations with 1 to 5 horses.

If the size of your operation does not fit this description, you can always use this handout

as a guide to tailor a composting system to meet your individual needs. Larger horse facilities or those using equipment (tractors) to manage their composting process can also develop a composting system, but will need a much sturdier design. Design help for larger operations and additional manure management assistance is available from your local conservation district.

BENEFITS OF COMPOSTING HORSE MANURE:

- Reduce the possibility of parasite re-infestation in your horse (the heat generated in the composting process kills worm eggs as well as pathogens and weed seeds)
- Reduce flies by eliminating their breeding ground
- Reduce odors (a properly managed compost pile should smell "earthy" and pleasant)
- Reduce the volume of material you have piled up (a properly managed composting process will reduce the pile size by about 50% in 3 to 4 months)
- Provide you with a free, easy source of compost (a valuable soil amendment) for your pastures, garden or yard...and your horseless neighbors may find it a valuable commodity as well!
- Reduce the chance of manure-contaminated runoff from your property reaching surface or ground waters in your area
- Make your property more pleasing for you and your neighbors to look at and enjoy

Building A Manure Composting System

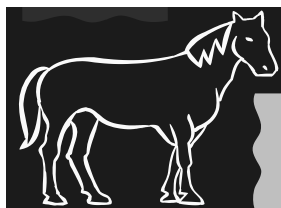
Although building a manure composting system can seem like a daunting task to add to your already packed to-do list, following these five steps can help you plan and prepare for success.

1. Select a site

Look for a high, level area on your property. If you build your composter in a low-lying area it will turn into a soggy mess. Remember to build your composter away from creeks, ditches, wetlands or other water bodies. Also, if applicable, choose an area that complies with local zoning regulations to avoid potential issues with neighbors. Finally, choosing a location that's convenient to your stall and paddock areas will make the chore of cleaning up easier and less time consuming.

2. Determine how many bins you need

You will need at least two bins, and maybe a third for convenience. A two-bin system works by piling manure and stall wastes in one bin until it is full, and then allowing this first bin to compost while starting to fill 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 using three bins. Three bins will allow one bin to be used for daily stall wastes, another bin to remain full and in the composting stage, and a third bin for the finished compost to be removed and used at your leisure. As for bin sizing, keep in mind that the capacity of one 8 foot by 8 foot bin filled 3 feet high is 192 cubic feet. You can use the equation below to calculate your storage needs.



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

$$\begin{array}{ccccccc} \times & \# & + & \text{Volume of} & = & \text{Monthly} \\ & \text{Number of horses} & & \text{used bedding} & & \text{compost bin} \\ & & & \text{material} & & \text{space needed} \\ & & & \text{(cubic feet)} & & \text{(cubic feet)} \\ & & & \text{per month} & & \end{array}$$

3. Purchase materials

A list of materials and tools needed is included in step 5. Depending on the type of wood you use and your local pricing, it should cost no more than about \$200 to purchase materials for each bin. Feel free to improvise and experiment by choosing locally available materials that will work best for you and your situation.

4. Build the bins

Following the design in this handout, one person can easily build this compost bin system in a weekend.

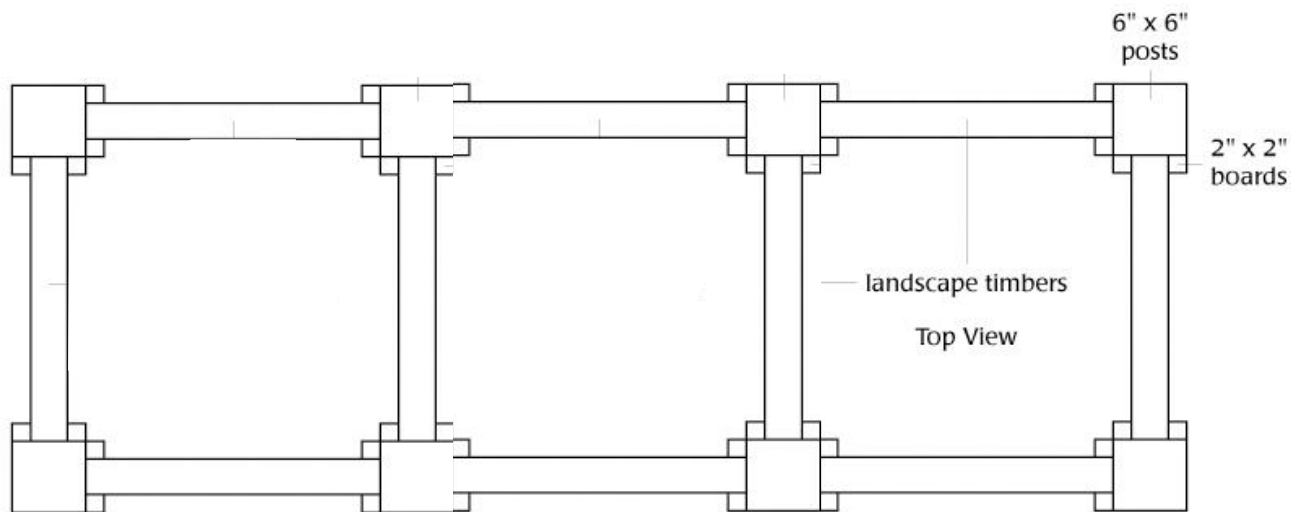
5. For three adjacent 4' x 8' x 8' bins, the following supplies and equipment are needed:

SUPPLIES

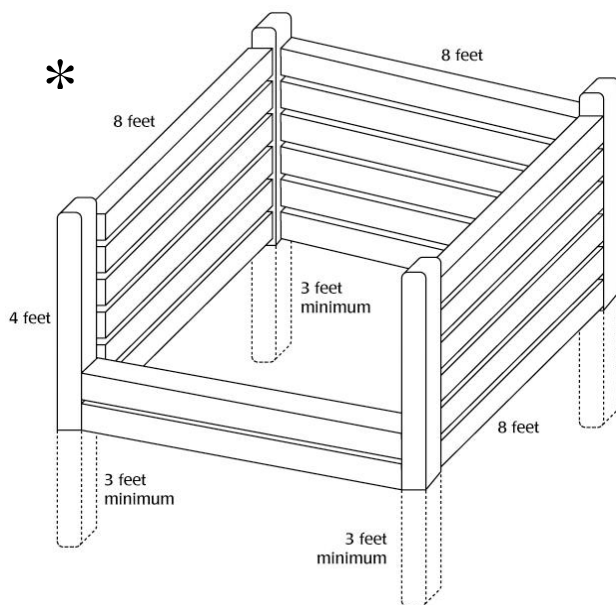
(8) 8' x 6" x 6" treated posts
 (40) 4' x 2"x2" treated boards
 (110) 8' landscape timbers (or similar wood)
 (160) 3" deck screws
 Tarp (or plastic sheet) to cover top of each bin
 Heavy items or straps to attach tarp to bins

EQUIPMENT

Drill with screwdriver head & drill bit
 25' tape measure
 Chainsaw or hand saw
 Carpenter's level
 Post hole digger
 Tamping rod or similar tool



Walls slide in place like a foaling stall.
 Repeat design for 2 or 3 bin system.



*These are the dimensions for a single compost bin using 8 foot landscape timbers stacked on top of each other. Corner posts should be at least 3 feet below ground with 4 feet above ground. When building three bins side by side (as in the diagram above), you will need a total of 8 posts to create three separate bins.

NOTE: number of landscape timbers will depend on the type and width of the timbers you purchase and how tall you wish to make your bins.

Managing the Compost System

Once you build and begin using your compost bin system, your work is not yet finished. Properly managing your compost system includes important tasks such as tarping, turning and watering. Like most living things, the microorganisms that break down the manure and bedding are aerobic and require air and water. Too much or too little of each can cause problems.

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 2 to 4 months the first bin should be finished composting and 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 soggy messes in the winter or too dried out in the summer. Covering them also prevents the nutrients you're saving for the garden from being washed away with rainfall and causing off-site water quality 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 and should result in an "earthy" smelling product. If the compost becomes anaerobic (without oxygen) 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 2 feet. An easy way to get air to the center and avoid turning the pile as frequently is to insert a couple 5 foot PVC pipes with pre-drilled holes along their length into the center of the pile. The pile will still need to be turned occasionally to get the manure from the outside of the pile 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 efficient way to add water is to simply hose down the manure in your wheelbarrow before you dump it in the pile.

5. Finished compost

How often you turn your pile and how damp the pile remains will determine how long it takes to create finished compost. While it will probably take between one to three months to finish, by properly following the guidelines in this handout your compost could be ready in as little as one month! 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.

6. Uses for compost.

Compost is a rich soil enhancement that improves soil quality, moisture retention, and plant health. Spread compost in pastures during the growing season no more than a 1/2" layer at a time and 3" to 4" per season. It can be also added to the soil of houseplants, gardens or flowerbeds...or shared with horseless neighbors.

For More Information on Composting Horse Manure

Check out the resources listed below and seek help if you need it. But now at least you will know that when manure happens you have a wonderful plan to make compost happen!

Horses for Clean Water: A program run and supported by horse owners promoting environmentally sensitive horse keeping. HCW 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.

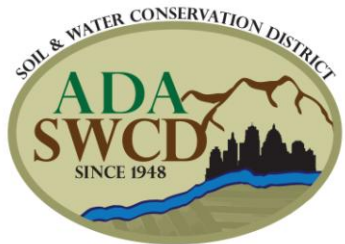
Ada Soil & Water Conservation District: A local subdivision of state government that provides technical, financial and educational assistance to farmers and livestock owners for conservation planning and implementation. Ada SWCD encourages wise use of natural resources including pasture management and irrigation water management.

Natural Resources Conservation Service: The NRCS is a federal agency that works with farmers and ranchers on issues related to wise use of natural resources, and has many technical, financial and educational resources related to natural resource conservation for landowners.

University of Idaho Cooperative Extension: Contact your county cooperative extension service office to get more information on pasture and manure management for horses. They can be located on the Internet by searching for cooperative extension service in your state or county.

Horsekeeping on a Small Acreage (2005 revised & updated edition) by Cherry Hill: An excellent reference book on horse facility design and management that includes information on designing a horse facility for your land, and general considerations for small acreage horse owners.

Other Books: Many books are available in the library on composting. A good source for information on agri-cultural composting is the *On-Farm Composting Handbook*, distributed by Northeast Regional Agricultural Engineering Service, 152 Riley-Robb Hall, Cooperative Extension, Ithaca, NY 14853-5701. Phone 607-255-7654 or FAX 607-255-4080, or Email at NRAES@cornell.edu.



The Ada Soil and Water Conservation District (Ada SWCD) has been conserving, sustaining, and enhancing natural resources in Ada and Boise counties since 1948. We are a local, non-regulatory subdivision of state government providing conservation assistance and education to private land owners and land users. <http://www.adaswcd.org>, 208-378-5729.

Alayne Renee Blickle is the creator and program director of the award-winning program Horses for Clean Water. An environmental educator working with livestock owners since 1997, Alayne is also a contributing writer for regional and national horse publications including *Equus*, *The Horse*, *Northwest Horse Source* and *The Horse.com*. Alayne, a life-long equestrian, lives with her husband in Nampa, ID where they raise and compete with reining horses on their environmentally-friendly guest ranch and horse motel, Sweet Pepper Ranch.

For more on Horses for Clean Water

contact Alayne at Alayne@HorsesforCleanWater.com or visit www.horsesforcleanwater.com.

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, 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 & warm in the middle, but nowhere else	Pile is too small. Piles smaller than 3' square have trouble holding heat.	Collect more raw material and mix it into the old ingredients.
The 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)