

Manure Composting Bin for Small Livestock Operation

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Management of manure on horse farms is a challenge for horse owners and equine facility managers. This is of particular concern at farms where horses are kept in stalls and land availability for manure spreading is limited. The growing number and size of unmanaged piles of manure is occurring on many properties. This is becoming an increasing concern due to greater public awareness and pressures in a progressively urban society. Runoff from stables, manure piles, and over-grazed pastures has the potential to increase risks of nonpoint source pollution from nutrients, organic particles, fecal coliform bacteria, and other pathogens.

Composting manure in equine facilities should be considered as the best manure management option if it is done properly. Microbes that are responsible for turning animal waste into compost require a balanced ratio of carbon (C) (as a source of energy) and nitrogen (N) (as a source of amino acids and protein). A ratio of C: N of 25:1 or lower is considered optimum for microbial activity.

In many stables woody materials such as saw dust, wood shavings, or wood chips are commonly used as bedding. Although these materials are excellent in terms of absorbency, they are rich in carbon with low or no nitrogen. These materials have a C: N ratio of 500:1 or even more. On average horse waste that includes manure and bedding often possess a C: N ratio of 75:1 depending on the amount and frequency of bedding replacement.

Other than the right C: N ratio, microbes also require adequate moisture and oxygen for their optimum activity. Oxygen is often provided to the microbes through turning the compost pile as often as possible. However, many horse owners find turning the stable waste difficult and a time consuming task. A simple aerated system described below can be used as an alternative to frequent turning of manure.

The system consists of two or more plastic trash bins that each holds roughly 750 lbs. of waste. (Figure 1.)



Figure 1.

The number of required trash bins is determined by the waste inventory. On average, a 1000 lb. horse generates 45 lbs. of manure daily. The actual waste collection depends on the number of hours that the animals are on pasture or exercise lots, amount of bedding, and how frequently soiled bedding is replaced.

For more information on *Manure Inventory*, please visit our factsheet: <http://ag.umass.edu/fact-sheets/manure-inventory>.

Required Materials and Cost

- 1- Three plastic standard 90 gal. trash bins (holds about 750 lb waste each): \$300 each
- 2- Standard Shop Blower: \$40 (HomeDepot)
- 3- Shop Vac Hose: \$18 (Amazon)
- 4- Outdoor 24 hr. Timer: \$15 (Amazon, Home Depot)
- 5- Extension Cord; \$12 (Home Depot)

Total: \$1050

A step by step instruction with required materials is described below:

Step 1: Obtain two or more 90 gallon trash bins (Figure 1.)

Step 2: Make a hole approximately 1.5” in diameter at the bottom of the bin (Figure 2.)



Figure 2.

Step 3: Pass a short (2 feet long) vacuum hose through the hole (Figure 3)



Figure 4.

Step 4: Connect the hose to a shop blower (Figure 4.)



Figure 4.

Step 5: Cut a piece of plywood board to fit the base of trash bin. For proper air flow, make several holes in plywood and glue 5-7" tall PVC pipe for stability. (Figure 5.)



Figure 5.

Step 6: Connect shop blower to a timer. For this purpose a simple timer can be connected to the shop blower to run 1-2 minutes per hour. Plug the timer into a source of energy (electricity or solar system). (Figure 6.)



Figure 6.

The compost in the full bin is often finished in about 8 weeks. Materials should be left another 4 weeks for curing and finishing. It is recommended to cover the materials with 3-4 inches of finished compost to speed up the process of composting.

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