UMassAmherst Outreach UMass Extension

# Low Cost Equine Manure Composting

The equine industry in Massachusetts, estimated to be over 50,000 animals, is of a size to make significant impact on non-point source pollution. An average horse generates about 45 lb. of manure per day, almost 10 tons per year as well as bedding. Thus, in Massachusetts approximately 500,000 tons of manure plus associated stall bedding are produced each year. In many stables, woody materials such as sawdust, wood shavings or wood chips are utilized as bedding. Although these materials are excellent in terms of absorbency, they are rich in carbon with low or no nitrogen. In other words these materials have a C: N ratio of 500:1. 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. Microbes that are responsible for turning animals waste into compost require a C: N of 25:1 or lower. This explains why a pile of stable waste cannot noticeably decompose over time. Other than proper C: N ratio, successful composting requires adequate moisture and oxygen needed for optimum microbial activity. Oxygen is often provided by tuning compost piles as often as possible.

**When done correctly, composting decreases the volume of waste, kills parasitic eggs & larvae, & destroys weed seeds.**

Management of manure and mud 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 have the potential to increase risks of nonpoint source pollution from nutrients, organic particles, fecal coliform bacteria, and other pathogens. Through a 319s grant funded by Massachusetts Department of Environment Protection, UMass Extension implemented two Aerated Static Pile (ASP) composting systems, also known as forced aeration to manage livestock manure and bedding produced on Blue Star Equiculture Farm in Palmer, Massachusetts.

Composting materials can be placed as one 10-foot pile or subdivided into three 10 ft section with a 4 way T for frequent addition of fresh materials and removing finished compost. The composting materials are piled on a woodchips base in flat and dry area preferably surrounded by grasses. The composting materials are piled on a woodchip base with a 2 row perforated PVC pipe running through the base and a 1 HP air pump which works for 1-2 minutes every hour. The pile is covered with a geo-textile fabric, which is impermeable to water. The compost in each subdivision is finished in 8-10 weeks including curing and finishing time. The same blower control and manure sensory system used for the aerated static composting bins is also utilized with the large pile setup. Please follow this link to see accompanying factsheet for aerated static composting bins factsheet: https://ag.umass.edu/crops-dairy-livestock-equine/fact-sheets/aerated-horse-manure-composting-bins-0

# Aerated Static Composting Pile

## *a) Materials and Cost*

1- 2 Row Perforated PVC pipes: $35 (10’ X 6”) (Home Depot)
2- PVC Cap: $7 (Home Depot)
3- Standard Shop Blower (1HP 634 CFM): $105 (Home Depot)
4- Geotextile Fabric: $30 (100’ X 42”) (Amazon)
5- Outdoor 24hr. timer: $15 (Amazon, Home Depot)
6- Extension Cord: $12 (Home Depot)
7- PlumQwik 4”x3” Flex Coupling: $9 (Home Depot)
8- Everbilt Round Head Combo Screws 32x1.5": $1.20 (Home Depot)

**Total: $215**

## *b) Assembling Guide*

Composting materials can be placed as one 10-foot pile or subdivided into three 10 ft section with a 4 way T for frequent addition of fresh materials and removing finished compost. The composting materials are piled on a woodchips base in flat and dry area preferably surrounded by grasses.

1- Place wood chips in an area of about 6’ wide and 10’ long.
2- Place the 2 row perforated PVC pipe on the woodchips. Put the cap at one end of the pipe. Connect the pipe to the pump/blower, using flex coupling and a one-foot pipe (Figure 1, Figure 2, Figure 4, and Figure 5).
(Note: Cut off the lip of the 3" section of the flex coupling (Figure 8))
(Note: For extra hold use cast iron clamp to secure blower to coupling (Figure 3))
3- Pile composting material on the woodchips to reach 3’ high and 4-5’ wide.
4- When pile is ready, cover with a geotextile fabric that is impermeable to water and secure the cover with ropes (Figure 6).
5- Connect timer to shop blower set 1-2 minutes per hour (Figure 7).
6- Connect timer to extension cord and power source (Figure 8).
7- Cover blower to protect from elements (Figure 9).

**Figure 1. Put cap at one end of PVC pipe.**

**Figure 2. Connect pipe to blower with coupling and 1ft. pipe**

**Figure 3. For extra hold use cast iron clamp to secure blower to coupling.**

**Figure 4. Connect coupling and blower to PVC pipe.**

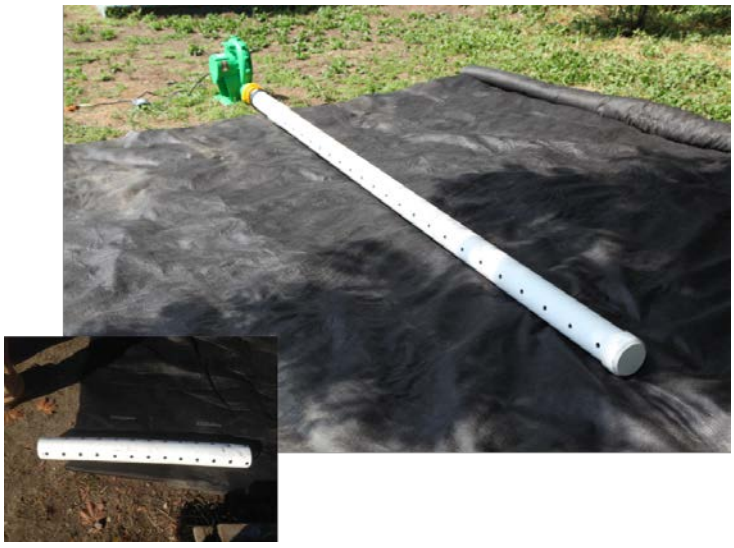

**Figure 5. Connected PVC pipe with blower**

**Figure 6. Cover with a geotextile fabric and secure with ropes**

**Figure 7. Set outdoor timer to 1-2 minutes per hour**

**Figure 8. Connect time to extension cord and source of power**

**Figure 9. Cover blower to protect from elements.**

**Figure 10. Cut off the lip of the 3” section of coupling.**

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