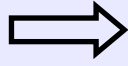
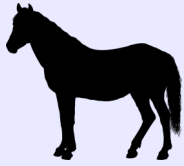


Equine Manure and the Vermont Required Agricultural Practices

Betsy sure keeps her owner busy



70 lbs of waste per horse per day

One stalled 1000-lb horse produces 35-50 lbs of manure and 15-20 lbs of soiled bedding daily



Manure happens, so what?

Unmanaged manure piles negatively impact your horses, property, water and wallet.

- ⇒ Flies breed readily in warm and wet manure piles and not only irritate your horses but can carry parasites and pose risks to their health.
- ⇒ The look and smell of an unmanaged pile can strain relationships with your neighbors.
- ⇒ Rainwater or snow melt that leaches from an uncovered pile can carry pathogens to nearby streams or into your drinking well and may be in violation of the Required Agricultural Practices (RAPs).
- ⇒ Unused manure is a lost opportunity to improve the health and productivity of your grazing lands.

Sizing. Waste storage facilities must be maintained to protect

structural integrity, prevent leaks or overflows, and provide adequate volume to prevent overflows. It's always best to overestimate. Sizing depends on 1) volume of waste produced on farm and 2) amount of time you need to store the waste.

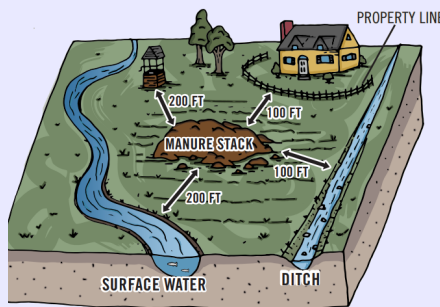
Volume of bedding waste per horse per day *	0.35 (ft ³)*20 lbs = 7ft ³ /horse/day
Volume of manure per horse per day	.016(ft ³)*50lbs = 0.79ft ³ /horse/day
Total volume of waste per horse per day	7ft ³ + 0.79ft ³ = 7.79ft ³ /horse/day
Total volume per day	7.79ft ³ X 3 horses = 23.37ft ³ /day
Number of days waste needs to be stored	6 months = 180 days
Total volume needed	23.37ft ³ /day*180 days = 4206.06ft ³
Footprint of storage needed	4206.06ft ³ / 6ft (height) = 701 ft ²
Length and width of storage	Square root of 701 = 26.5 ft x 26.5 ft

Example: Shawn has 3 horses, uses loose straw for bedding, and has manure hauled offsite twice a year; in the fall and spring. For simplicity assume the horses are stalled for the entire time.

*

Storage Standards

Siting. The RAPs specifically state set-backs from surface waters, ditches and wells (see image below—not pictured is 100 feet from road). Piles also cannot sit in frequently flooded areas or directly on bedrock. Ideal siting is on high, flat, and compacted ground, away from the flow of rainwater, accessible from the stables and for haulers, complies with local zoning rules and considers aesthetics (down-wind and out of sight).



Manure Stacking Setbacks

Design. The RAPs allow field stacking that follows siting requirements but manure cannot stay in one place for more than 3 years without being land-applied, actively composted, or hauled off-site. All waste also must be managed to prevent "runoff". Un-composted manure piles should be roofed or tarped and kept as dry as possible to avoid fly and parasite production. Improved facilities can include flooring and roofs to protect against rain and snowmelt runoff. Siding provides a structure for machinery to push against when turning compost and can allow for air-flow. Additional perforated PVC piping increases aerobic activity. Materials and structural components should be selected to fit your intended uses, equipment, and budget.

Bedding Type	Volume (ft ³) Per Pound
Straw (loose)	0.35
Sand or Soil	0.01
Sawdust	0.08
Wood chips/shavings	0.11

How-To

- ◇ Input: Manure, bedding, yard waste (leaves, grass clippings), and organic food waste from your kitchen (fruits, vegetables, coffee grounds, etc.) can all go into a compost pile. Decomposition is most rapid when the inputs are finer in size and when the ratio of Carbon to Nitrogen in the pile is 30:1. You may need to adjust your inputs to match this ratio. One part manure to two parts bedding is close to this ideal ratio.
- ◇ Aeration: Air is an important part of decomposition, it feeds the aerobic bacteria and helps reduce pile odor. Active compost turning either by hand with a pitchfork or with a front-loader on a weekly or monthly basis is recommended. Passive aeration in the design of your storage structure can include slats in the siding, or perforated PVC piping (see picture for examples of both).
- ◇ Heat: Heat is a natural byproduct of composting. Piles should be at least 43 cubic feet in order to generate sufficient heat to kill parasites and weed seeds. Piles may need to be larger in cold weather to achieve the same effect. Finished compost will no longer heat up to the same temperatures.
- ◇ Moisture: Pile should be kept moist but not soaking wet.
- ◇ Time: Finished compost takes 60–120 days to achieve depending on starting materials, frequency of turning, pile size, and other factors.
- ◇ Finished product should look like potting soil. Picture to the right shows three bin system with reduction in volume.
- ◇ In a two bin system—recommended for smaller farms—the first bin is receiving daily waste while the second is being actively composted. By the time the first bin is full, the second should be ready to be emptied and land-applied (see below).

Benefits

- ◇ Reduces pile size and storage needs
- ◇ Kills weeds and parasites—more valuable finished product either for sale or use on your land
- ◇ Protects horse health, fewer flies
- ◇ Meets the RAP requirements
- ◇ Lower odor than unmanaged manure
- ◇ Improved water quality impact if spreading



Spreading

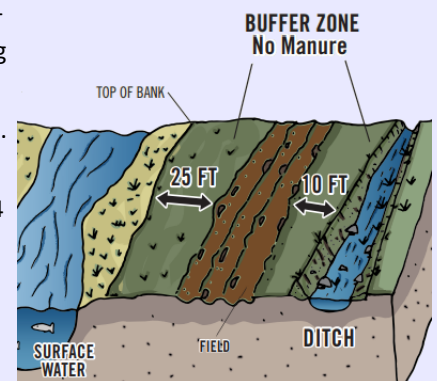


Manure and compost can help significantly improve pasture health and forage when well integrated into your rotational grazing practices. A simple routine to remember is graze, mow, spread. Each pasture would not need application more than twice per year with 1/4 to 1/2 inch thickness total.

If you choose to spread, RAP guidelines apply. Contact your local Conservation District for help setting

up your nutrient management plan and soil sample collection:

- Soil sample every three years: you can not apply in exceedance of field nutrient needs.
- Keep records of spreading: when, where, weather, rate, and source.
- Do not spread between December 15 and April 1 (or between October 16 and April 14 if in frequently flooded areas)
- Do not spread within 100 feet of a private water supply, or 200 feet of a public water supply.
- Do not spread on wet, frozen, or snow covered ground, on exposed bedrock, or within 10 ft of a ditch or 25 ft of a surface water (100 ft from a surface water if on a 10% slope or greater).



Land-Application

Remember, manure can't sit in that field stack forever.

Removal

If you don't have enough land to spread, compost companies, neighbors, landscaping companies, or even mushroom farmers may want it. Post online, call your local composter, or sign up with a hauling service.

Learn More:

- ⇒ Contact your local Conservation District for one-one technical and financing assistance.
- ⇒ Langley Environmental Partners Society. Land Management Guide for Horse Owners and Small-Lot Farmers <http://www.leps.bc.ca/wp-content/uploads/2015/04/Land-Management-Guide-web.pdf>
- ⇒ Alberta Agriculture Food and Rural Development. Caring for Alberta's Rural Landscape: Manure and Pasture Management for Horse Owners. 2003. <https://open.alberta.ca/publications/2810416>

