



LEPS

Langley Environmental Partners Society



Horse Manure Composting Program

Calculating Compost Bin Sizes

In order to effectively store your horse manure compost you need to be able to determine the approximate sizing of your manure bins. The following calculations are from the BC Environmental Farm Plan and should give you a good idea of how large your system needs to be. These are general guidelines to follow and are over-estimated in order to compensate for bedding material added to the system. You know your property better than anyone and can decide for yourself what the most appropriate measurements will be for your system.

Estimated daily manure volume for horses

26.1 Litres/day waste production (Avg. 450 kg horse)

56.6 L/day suggested solid manure storage

Determining storage duration

Typically, 6 months (180 days) of storage is required for the Fraser Valley and Vancouver Island. Other parts of BC may need 7 months (210 days) or more of storage. Variations depend on crops grown, soil type, soil temperature and local rainfall. Storage requirements are less on farms where manure is spread on grasslands or well-drained soils.

Determining storage size

Step 1: estimate daily manure volume using equation 1a

1a) Daily manure production for horses = number of horses x horses' daily manure production rate

Step 2: determine manure storage required using equation 1b

1b) Manure storage requirements = farm daily manure production x days of storage required (180)

Step 3 and 4: determine using equation 2a and 2b

2a) Effective depth of storage = chosen storage depth - freeboard safety (typically 0.2 m)

2b) Storage length = total storage required / effective depth of storage / storage width

Calculating Compost Bin Sizes continued...

Here are some example size calculations to get you started.

Example 1

For a horse property with 5 horses and 6 months of storage required (in metres).

1. Daily manure production = number of horses x horses' daily manure production rate
Daily manure production = $5 \times 26.1 = 130.5$ litres/day
Divide by 1000 and round to one decimal place = $0.1 \text{ m}^3/\text{day}$
2. Manure storage requirements = daily manure production x days of storage required
Manure storage requirements = $0.1 \times 180 = 18 \text{ m}^3$
3. Effective depth of storage = chosen storage depth freeboard safety
Effective depth of storage = $2 - 0.2 = 1.8 \text{ m}$
4. Storage length = total storage required / effective depth of storage / storage width
Storage length = $18 / 1.8 / 3 = 3.3 \text{ m}$

Example 2

For a horse property with 5 horses removing 4 wheelbarrow loads per day and 6 months of storage required (in feet).

1. Daily manure production = wheelbarrow loads per day x size of wheelbarrow
Daily manure production = $4 \times 4 \text{ ft}^3 = 16 \text{ ft}^3$ per day
2. Manure storage requirements = daily manure production x 180 days
Manure storage requirements = $16 \times 180 = 2880 \text{ ft}^3$
3. Effective depth of storage is 5ft with 10ft x 10ft bins
4. Storage length = total storage required / effective storage depth / storage width
Storage length = $2880 / 5 / 10 = 57.6 \text{ ft}$

Bin dimensions should be 10ft wide x 57.6 ft long x 5 ft high.

Good Luck and Happy Composting!