

Managing Manure

Living on
The Land

If you've got livestock, you've got poop. Over time, the pile grows. The pile gets even bigger if you use bedding.

Animal manure contains valuable organic matter and plant nutrients that make great fertilizer. Managing your manure can save you money and protect your land's natural resources.

On the other hand, manure often contains weed seeds and pathogens that can threaten livestock and human health. Fresh manure may also have an offensive odor and attract flies.

Table 1. How much manure do we get?

| Animal | Cubic yards/6 months |
|----------------|----------------------|
| Horse | 5.5 |
| Cow (1,000 lb) | 7 |
| Sheep | 0.5 |
| Chicken | 0.25 |
| Pig | 1.5 |

Data: OSU Extension publication EM 8649

Poorly-managed manure in animal pens contributes to poor animal health, particularly foot problems, by concentrating bacteria and increasing mud. If you do not manage manure properly, bacteria and nutrients can create problems for people and water-dwelling species by contaminating streams, irrigation water, and wells.

Your goal is to reap the benefits of manure while decreasing the risks. Be sure to keep manure out of ground and surface water, and do not let it build up so that it causes animal and human health concerns.

What to Do

1. Drag pastures

Pull a pasture harrow, a piece of chain link fence, or a set of iron bedsprings behind a tractor, truck, or ATV to break up piles of manure in pastures. This makes nutrients more available to plants and reduces parasite loads by exposing larvae to sunlight and air.

Drag your fields at least once a year. Ideally, you would do this right after moving livestock from one pasture to the next as part of a rotational grazing system.

2. Collect from all-season pens

Manure is easiest to collect from a dry-surface, all-season pen. If your animals spend time in pens or corrals, you can reduce mud by replacing the top 6 to 8 inches of soil with a hard material such as crushed rock, sand, wood chips, or hog fuel.

For permanent, all-season pens, dig the soil out, line the bottom with a sturdy, non-woven geotextile fabric to keep rock from mixing with the soil, and then fill with your material of choice. If you put sand on top of rock, separate the layers with another layer of geotextile. If you need help, contact your local Soil and Water Conservation District (SWCD) or Oregon State University Extension Service office.

3. Use it

You can spread $\frac{1}{4}$ to $\frac{1}{2}$ inch of fresh or composted manure on pastures during dry weather when plants are actively growing. Test your soil to determine your plant nutrient needs; retest every few years.

If you apply the manure too thickly, nutrients can contaminate water. Some manure, such as fresh poultry, can burn crops with excess nitrogen.

If you must spread fresh manure on pastures, wait at least 3 weeks before grazing — and longer, if possible — to reduce the likelihood of parasite and pathogen transmission to livestock. Wait 90 to 120 days after applying fresh manure before harvesting crops grown for human consumption.

4. Give it away or sell it

Let gardeners, farmers, and commercial compost facilities know you have excess manure. Advertise on the internet or at garden and feed stores. Some areas have Manure Exchange Programs, usually sponsored by local SWCDs.

5. Store it

Store your manure away from water sources to avoid polluted runoff and leaching. Cover the pile when heavy rain is expected. You can build sides around the collection



area from concrete, wood, or other materials you may have at hand. A concrete pad keeps nutrients from leaching into soil and makes it easier to use a tractor bucket. The cover can be as simple as a tarp or professional as a roof high enough for a tractor bucket. Put rock in the area in front of the pile to keep it from becoming a mud hole.



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Design for at least 6 months of storage so you won't have to spread manure or compost in winter on dormant and/or saturated pastures. Use separated bins to allow composting manure to mature while you start new piles. Moving piles from one bin to the next adds oxygen, which speeds up the composting process.

Check with your local planning commission to find out if permits are needed before you build your storage structure. Contact your local SWCD for technical assistance.

Composting manure

Composting can reduce the volume of manure by about 50%. The key ingredients for compost are materials containing **carbon (C)** and **nitrogen (N)**, **air**, and **water**. An ideal C:N ratio is between 20:1 and 40:1. Manure provides most of the N and bedding provides C. Some manures, such as pig or poultry, can be too wet and contain too much N to compost well. To correct this, add a dry, high-C material such as wood chips or straw. Sheep, goat, horse, and cow manures usually have a favorable C:N ratio.

Composting is an **aerobic** process (requires lots of oxygen). The best way to maintain

Table 1. Fresh manure nutrient values

| Animal | % N | % P | % K |
|-----------|-----|-----|-----|
| Chicken | 1.1 | 0.8 | 0.5 |
| Dairy cow | 0.3 | 0.2 | 0.3 |
| Horse | 0.7 | 0.3 | 0.6 |
| Steer | 0.7 | 0.3 | 0.4 |
| Rabbit | 2.4 | 1.4 | 0.6 |
| Sheep | 0.7 | 0.3 | 0.9 |

Data: Rodale's Guide to Composting

aerobic conditions is to build a pile that allows air exchange throughout (good **porosity**). Aeration pipes (perforated pipes placed vertically in the pile or horizontally under the pile) and turning help maintain good airflow and porosity. Turn the pile every few days when pile temperatures exceed 130°F.

Microbes responsible for the decomposition process live in the wet film surrounding the solids in the pile. If you squeeze a handful of compost, a sheen of water should remain on your gloves, and you should be able to press out a few drops of water. If the pile is too dry, the composting process slows down or stops. Additional moisture may be required during hot and dry periods. If the pile is too wet, anaerobic bacteria take over and the pile will smell.

Pathogens, parasites, and weed seeds in the manure are most reliably killed if temperatures within the compost pile stay between 140 and 160°F for several weeks. At a minimum, compost must reach 131°F for 3 consecutive days to kill pathogens.

Make your manure pile 4 to 6 feet tall, 5 to 6 feet wide, and as long as needed. This volume helps the pile retain moisture as well as heat generated by the microbes. Larger piles can be difficult to turn.

Compost usually takes 3 to 6 months to decompose well. Finished compost will be fine and crumbly and have an agreeable odor. Wear gloves when contacting compost and wash hands after contact.



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For more information on manure management and composting, contact your local Extension Agent, SWCD, or State Department of Agriculture. Technical and financial assistance is available for livestock owners wishing to address resource concerns on their property.

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