



Small Scale Solutions for your Farm

Composting Manure



Do You Have Problems with:

- Manure piling in livestock buildings because it is the wrong time of year to spread it
- Neighbors complain about how the manure smells
- Manure is too heavy and wet to spread easily
- Weed seeds in the manure are a problem
- You don't have enough cropland to spread all the manure

Benefits of Composting Manure:

- Reduces odor and fly problems
- Reduces the volume of manure
- Finished compost is dry and fairly light, so it is easier to transport and spread
- It can be sold or used on other farms
- Fertilizer nutrients in compost are released more slowly than from raw manure
- It provides a way to store manure until you are ready to spread it



Compost could create resource concerns if not stored properly.

Composting Manure

- Initial carbon to nitrogen (C:N) ratio of the compost material should be 25:1 and 40:1 for ideal fertilizer value of the finished product.
- This would be roughly 2 scoops of C (i.e., sawdust, straw) to 1 scoop of N (manure).
- Finished compost should be tested for fertilizer value before applying to farm fields to avoid applying too much.





What Kind of Manure Can Be Composted?

Composting is well suited for manure that contains a lot of bedding material, such as straw, sawdust, wood shavings, or spilled hay. Manure from horses, goats, dairy cows, or beef cows, as well as poultry, will compost easily. Wetter or more concentrated manure (from pigs or egg laying hens) will need to have material mixed with it so that it will compost properly.

Locating Compost Piles

Composting can be done outdoors or under a roof. Make sure you can easily get to the pile with your tractor in all types of weather.

Outdoor Composting:

Long piles, called windrows, are built up. You can do this on a concrete pad, or in a well-drained location with firm ground. It must be hard and dry enough for a tractor to work around the pile in all types of weather.

- The area must drain well; slope the ground away from the windrow. Don't allow rainwater to run into the compost from the surrounding area.
- Don't locate compost near a well, stream, lake, wetland, or any other place that could be harmed.
- Plant grass (at least a 20-foot wide strip) at the downhill end of the composting area so any water running off the pad can run through the grass and soak in.

Composting Under a Roof

- NRCS has designs for compost sheds. The shed is designed so the compost can be turned from one bin into another using a front-end loader or skidsteer.
- Compost piles can also be surrounded by round hay bales and covered with a tarp or plastic when it is not possible to put up a shed.



Composting can be as simple as using a tarp.





Associated Costs

- Hard Surface:
 - Need concrete pad, or firm area. Stabilize with lime.
- Structure:
 - I.e., Shed, bind, hay bale enclosure, or open windrows.
- Water:
 - Need access to water for adding to piles during composting.
- Time:
 - Moving manure, turning piles, and using the finished compost.



Composting facilities could be elaborate.

What Happens Inside a Compost Pile?

- Naturally occurring bacteria do the work in a compost pile. They need air, moisture, some high-nitrogen material like manure, and some high-carbon material like straw.
- Bacteria cause the pile to get hot, up to 160°F. You can see this when you turn the pile and steam comes out. The heat kills weed seeds and pathogens in the manure.
- The compost pile has to be turned over and mixed several times so the outside parts get into the middle to be heated, and so the pile will get air into it.
- When compost is finished, it will be dark brown and crumbly and will smell like good earth. Depending on how much you mix and turn the pile, it may take anywhere from three to six months for all the manure to turn into compost.

How Often Should Compost Be Turned Over?

- At a minimum, turn a pile twice during the composting process. More turning will improve the quality of the compost.
- Turning compost gets air into the pile—this is important!
- When the pile is first built, it will heat up pretty fast. An inexpensive compost thermometer (like a meat thermometer but with a very long probe) helps you know when the pile is hot enough.





- Heating to 145°F for at least three days will kill most weed seeds.
- As soon as the pile cools a bit from the first heating, it can be turned the first time.
- When turning the pile, move material on the outside and top into the inside. Break up big lumps. The second pile will heat more slowly, but should also reach 145°F for three days or more.
- After the last turning, let compost age for a few months to be sure all the fertilizer nutrients are stabilized, and the weed seeds have been killed. It will now be ready to be spread on farm fields, used for yards, gardens, or sold as a soil improver.

There are ways to force air into a compost pile to make it “cook” faster and more evenly.

- Pipes can be set in the pile to carry air into the middle.
- The pile can be set on perforated pipes or pallets to provide a way for air to get in.



Composting facility.

Maintaining a Manure Composting System

- Composting needs attention!
- If large material (woody fragments, branches, long hay) is in the compost, it may have to be chopped before adding it. The smaller the particles, the faster it composts.
- The piles must be turned and kept neat.
- The area around the pad or shed must be kept neatly mowed.
- Water will have to be added to the piles when they get dryer than the “wrung-out sponge” condition.
- Compost piles do have some odor. If this is a problem, cover the pile with straw, sawdust, or a tarp. For small amounts of compost, there are rotating barrel-type containers that will hold in any smell and produce compost quickly.
- Old piles that are ready for use need to be removed so new manure can be composted.





Technical and Financial Help Is Available

Whether you measure your farm in terms of feet or acres, your local Natural Resources Conservation Service (NRCS) office has experienced conservationists that can help you develop a Conservation Plan to conserve, maintain, and restore the natural resources on your land and improve the long-term health of your operation.

There is no charge for our assistance. Simply contact your local office to set up an appointment. You may also be eligible to receive financial assistance. Your NRCS office will explain any programs that are available so you can make the best decision for your operation. All NRCS programs and services are voluntary.

For More Information

Visit the [Natural Resources Conservation Service](#) or visit farmers.gov/service-locator to find your local NRCS office. You can also check with your local USDA Service Center, then make an appointment to determine next steps for your conservation goals.

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

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NRCS conservationist assisting small scale farmer with developing a customized conservation plan.

