



**USDA** Natural Resources Conservation Service  
U.S. DEPARTMENT OF AGRICULTURE

**South Dakota  
Soil Health Coalition**

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The South Dakota Soil Health Coalition is a producer-led, non-profit, membership organization that was created in the spring of 2015. The Coalition is governed by a nine-member board of farmers and ranchers from across the state and includes several staff members. Staff and board members strive to carry out the Coalition's mission to "Promote improved Soil Health" through education and research.

## Composting for Soil Health!



Steel posts can be installed on each end of the pallets to hold them in place, or one steel post can be placed in the corners, and pallets can be wired together and attached to the post. Weed barrier or hardware cloth can be attached to the inside of the bins to help hold the pile together, but this is optional. The bottom should be left uncovered so microbes from the soil can enter the pile. A cover using a tarp, plastic, or plywood is helpful to keep rodents and animals out of the piles and keep the piles from becoming overly moist.

Commercially available compost tumblers with two chambers can be purchased for under \$200. These small batch tumblers are a convenient way for urban gardeners to compost in their backyard where space may be limited. These tumblers make turning the compost very easy, and the two chambers allow you to add new materials to one side while the other side is still composting. The ratio of 3 parts browns to 1 part greens should be followed when using a tumbler, or the correct composting may not occur.

When the composted materials look like rich, brown soil, it is ready to use. Apply one-half to three inches of finished compost and mix it in with the top four inches of soil about one month before planting. Compost can be applied as a top dressing in the garden throughout the summer. Compost is excellent for re-seeding lawns, and it can be spread one-quarter inch deep over the entire lawn to rejuvenate the turf.

This information was compiled from sources including the North Dakota Department of Environmental Quality, the Institute for Local Self-Reliance, Good Cheer Food Bank Garden, *Compost Tips for the Home Gardener*, The Compost Gardener, South Carolina Department of Health and Environmental Control, and the United States Environmental Protection Agency.

This material is based upon work supported by the U.S. Department of Agriculture, under agreement number NR236740XXXXC012. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture or South Dakota Soil Health Coalition. In addition, any reference to specific brands or types of products or services does not constitute or imply an endorsement by the U.S. Department of Agriculture or South Dakota Soil Health Coalition for those products or services.

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## WHY COMPOST?

- Promote healthy soil
- Reduce household waste
- Build soil organic matter
- Cycle nitrogen, sequester carbon
- Improve water infiltration & storage
- Increase crop growth & productivity
- Reduce erosion

# What is composting?



**THERE ARE TWO COMMON SYSTEMS: CONTINUOUS AND BATCH COMPOSTING.**

Composting is the biological decomposition of organic materials by bacteria, fungi, worms, insects and other organisms occurring under aerobic conditions. Compost is a dark, crumbly, earthy-smelling, biologically stable soil amendment. Composting is simply a process of supplying these soil building organisms with food, water, and oxygen.

A compost pile contains “browns” and “greens.” Browns are materials high in carbon, and greens are high in nitrogen. The target amount of each is 3 parts brown to 1 part green. If a pile contains too much carbon, it may take a long time to create compost. If a pile contains too much nitrogen, it may be difficult to get air into the pile, and it may become overly wet and have a strong odor.

**Browns: Autumn leaves, straw, shredded paper, corn stalks, shredded wood or small twigs, dried grass clippings.**

**Greens: Food scraps (fruit or vegetable), green grass clippings, egg shells, manure, disease-free garden waste.**

**What NOT to add to your pile:** Dairy products, diseased or insect-ridden plants, fats, grease, oil, meat, pet feces, weeds with seeds, vegetation treated with clopyralid, aminopyralid or picloram herbicide, plastic or food wrappers.

The ideal pile size is 3' x 3' and 3-4' tall. Piles smaller than this will have difficulty reaching the desired temperature, and larger piles will have difficulty getting air to the center of the pile. Start your pile with a 4-6" layer of bulky brown materials like branches, wood chips, or corn stalks. This aids in air circulation. Then continue to add brown and green materials in layers. Add 2-3 times as much brown material as green. On top of each layer of brown material add a thin layer of soil to help introduce microbes to the pile. Add water as needed. The pile should be moist to the touch, but you should be unable to squeeze water out of it. Make sure to always cover any food scraps with a layer of brown material to avoid attracting rodents and other animals. The pile may need a cover to keep it from becoming overly wet during rainy periods.

Continuous composting is when new materials are added to the pile throughout the year. This is the most common type of composting, but it is more difficult to sort finished compost from new materials added to the pile. Batch composting is where all materials are put together at one time, creating one batch of compost at a time. This can be much faster and produces a cleaner compost.

Where room is available, a 3-pile method can be the easiest and fairly quick way to compost. The quickest way to create finished compost in this method can be called 1-2-3. In this method, you add new materials to bin #1. When this bin is full, you transfer the partially composted materials from bin #1 to bin #2. This helps stir the pile and increase air flow, which in turn will shorten the time needed for decomposition. Then, you start to add new materials to bin #1 again. When bin #1 is full the second time, you transfer materials from bin #2 to bin #3, and bin #1 goes into bin #2 again. Compost in bin #3 should be finished or nearly finished and ready to use.

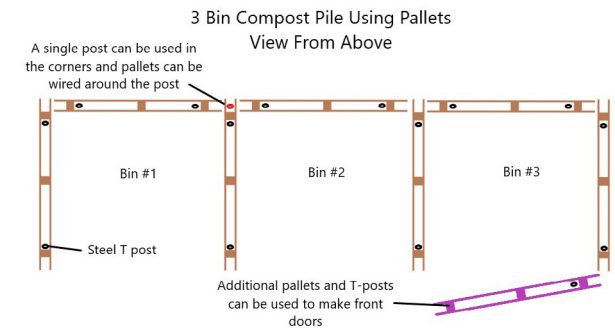
You may have enough materials to do this several times a year, or it may just be an annual event. A simple 3-pile system can be built from repurposed wooden pallets.

Batch composting will provide finished compost much faster than continuous, but getting all the ingredients together at one time to create a batch can be difficult. In batch composting, a pile is created using all the required green and brown ingredients along with water and some soil. The pile should be turned appropriately once every week. The ideal temperature of a pile is between 122-131 degrees Fahrenheit. At 149 degrees and above, organisms responsible for decomposition begin to shut down or die. A compost pile will naturally begin to cool as it approaches completion.



## 3-Bin System Using Recycled Pallets

To create a 3-bin system using pallets you would need 7-10 wooden pallets, 8-17 steel T posts or similar posts to hold the pallets upright, and some wire to tie everything together. Options would also include weed barrier or hardware cloth fence to line the sides of the bins, and a tarp, plastic, or sheets of plywood as a cover. Use four pallets to create the side walls for the bins and three pallets to create the back walls. You can also use three pallets to create a front to the bins to help hold the materials in, but this is not required.



## Key to Successful Composting 3:1 Ratio



**3 Parts Brown**

**1 Part Green**

**Browns:** Autumn leaves, straw, shredded paper, corn stalks, shredded wood or small twigs, dried grass clippings.

**Greens:** Food scraps (fruit or vegetable), green grass clippings, egg shells, manure, disease-free garden waste.