Composting Basics
--Adapted from MPCA; "Start composting in your backyard"

Composting reduces waste and improves garden soils. In Minnesota, 12% of the waste stream is food scraps and up to 18% is yard waste! Why throw valuable resource away when it can be put to good use in your yard and garden? By composting leaves ("browns") with kitchen scraps, grass clippings and fresh plant materials ("greens"), a biological rich material is created that improves soil health and reduces the need for additional fertilizer. Healthy soils produce healthy gardens. Getting a compost bin started involves four basic steps: Make or buy a bin, add layers of yard waste and kitchen scraps, add water, mix it up with a shovel or pitchfork once in a while.

What's Compostable?
You'll get the best results if you use the right mix of ingredients to make compost. The key materials are nitrogen-rich "greens," carbon-rich "browns," water, and air. All of these are essential, but they're easy to mix together for quality compost.

What isn't? There are some items that should be kept out of compost piles to minimize odors and keep your pile from attracting scavengers like dogs and raccoons: Meat, dairy, oils (incidental small amounts OK); pet feces (dog, cat, or bird); diseased plants; weeds gone to seed; ash from charcoal or coal.

Begin with the Bin

**Location:** Pick a spot that's convenient to add materials, has access to water, good drainage, and, locate the bin in a shady spot to reduce the need to add water, and that will not bother neighbors.

**Containers:** You can compost in a simple pile, but using a bin helps compost piles retain heat and moisture, and keeps them neat. As materials are added and mixed together, the finished compost settles to the bottom of the bin.

**Size:** A pile or bin that is 1 cubic yard (3 feet high, 3 feet wide, 3 feet long) is small enough to be easily turned, but big enough to retain heat through most of the year. In the coldest part of the winter, the composting process may stop, but will start up again as soon as it warms up.

Add the first materials
If you're just starting a compost pile, measure out “greens” and “browns” to create a good mix of materials—for example, an equal mixture of brown autumn leaves and fresh grass clippings will give you an optimal composting combination. Don't worry about getting the mix exactly right, as it's very easy to add material to adjust the pile's performance.

- **Lay a base.** Start with a layer of browns, laying down 4 to 6 inches of twigs or other coarse carbons on the bottom of the pile for good air circulation.
- **Alternate greens and browns.** Add layers of nitrogen-rich "green" and carbon-rich "brown" materials. Make layers about 4 to 6 inches thick. Once you turn the pile the first time, these materials will get mixed together and compost more efficiently.
- **Size does matter.** Materials will decompose faster if they are broken or chopped into smaller pieces. For example, branches and twigs will take a lot longer to decompose than wood chips.
• **Water as you go.** Compost should be moist, like a wrung-out sponge. Squeeze a handful of compost; if small beads of water appear between your fingers, you have enough water. Your pile will get water from rain, as well as the moisture in the greens. If the pile gets too wet, you can turn it more frequently to dry it, or add more dry brown materials to soak up excess moisture.

**Mix the Pile**
Once you build your pile, the real composters get to work—bacteria, fungi, and insects break down and mix the materials in the compost pile. As the organic materials decompose and your compost pile is big enough to hold the heat, your pile will get hot on the inside and you might see some steam. The microbes in your compost need **water** and **air** to live. Turning your pile each week will add air to aid decomposition and control odors.

**Repeat until it's complete.** The composting process can be pretty quick in the summer. Compost may no longer heat up after a few weeks, but may reheat after being turned. Finished compost material is dark and crumbly, fresh-smelling, and no longer looks like what you originally put into the bin. The more the pile is mixed and turned the quicker it will compost.

**The Real Composters**
Composting is done by a wide variety of organisms found naturally in organic matter and soil. They work together, feeding on your pile, to break materials down.

• **Bacteria** perform the primary breakdown of organic materials. Bacteria aren't added to your compost pile—they're found in almost all forms of organic matter. There are several different types, and they will flourish and reproduce rapidly under the proper conditions.

• **Nonbacterial composters,** fungi, worms, and a variety of invertebrates, go to work on your pile. Some feed directly on plant tissues, helping bacteria in their role of primary decomposers. Bugs like centipedes and beetles will feed on the smaller invertebrates.

**Using Finished Compost**
Compost contains nutrients and improves soil quality which improves plant growth. By using compost, you improve the soil and reduce your use of fertilizer and water.

• Mix in compost to improve soil. In sandy soils, compost acts like a sponge, retaining water and nutrients where they can be reached by plant roots. In clay soils, compost makes the ground more porous, creating tiny holes and passageways that help soil drain more quickly.

• Spread compost on your lawn to help fill in low spots.

• Use as a mulch for landscaping and garden plants. Mulches cover the soil around plants, protecting the soil from erosion and the drying effects of wind and sun.

• Mix compost into pots for potted plants.

**Diagnosing common backyard compost problems**
**Check for moisture:** One of the most common reasons a backyard compost pile works slowly or even stops composting is **lack of moisture.** The easiest way to check for proper moisture conditions is to grab a handful of compost from the bin.
The pile doesn't heat up:

- **The pile is too small.** In order to get the compost pile hot, it must be a minimum of 3’ high by 3’ in circumference. In the winter it should be a minimum of 5’ x 5’.
- **It is too dry.** Try the first test: Pick up a handful of compost and squeeze it in your hand. If you do not see beads of water between your fingers, the pile is too dry. Turn the pile and water thoroughly with a hose. You should let the pile rest for several hours, then give it the fist test again. If beads of water do not form between your fingers, more water is needed.
- **Nitrogen.** If the pile is new or does not seem to be composting well (not heating up) you may need to add more “green” to the pile. The microbes need food to grow and do the work of breaking down the organic material. Nitrogen provides the energy they need. Try adding grass clippings or fruit and vegetable scraps.
- **Aerate.** A compost pile needs to breathe to function efficiently. Use coarse materials such as wood chips to create air spaces in the pile and add carbon to the mix.
- **Maybe it’s done.** Compost is finished when it looks brown and crumbly. Use a screen to sift out bigger pieces of unfinished compost, rocks, twigs or other unwanted materials.

There's an odor:

- **Rotten egg smell.** Your pile may not be getting enough air because it's too wet. Turn the pile with a shovel or pitchfork to let in air and mix things up. If particle size is small (under one inch), add a bulking agent such as wood chips about two inches in size.
- **Ammonia odors** often indicate too much nitrogen, such as grass clippings or food waste. Add more carbon “brown” materials: dead leaves, non-recyclable paper, or straw. Mix the pile thoroughly.

Attracts rodents or other animals:

- Do not add materials such as meats, oils, fat, foods cooked in oils or fats, bones, dairy (incidental amounts OK if mixed in well), and weeds that have gone to seed to the compost pile.
- Keep it covered. Cover or bury added food wastes with compost or “brown” materials in the middle of the pile. Covering the bin will help keep out larger pests.
- Insects such as gnats, millipedes, bees, and ants are a normal part of composting, but an active pile will create enough heat to kill their eggs and reduce the nuisance insects.

**Winterizing your compost pile**

Minnesota winters can be long and cold. If your compost pile is too small, it may stop composting for a while. To keep your compost pile “cooking” in the winter, you will need a bigger pile that is 5’ x 5’ x 5’. That should provide enough insulation to retain heat in the middle of the pile. Another option is to remove all of the “done” compost and leave your compost bin about ½ empty. This will give you enough room to store the food waste generated over the winter in your bin. The food will freeze which further softens it for composting in the spring when it warms up. In the spring, you add leaves to the bin, mix it with the food scraps and it will start composting again all by itself. Have a place to store enough leaves, hay or straw to have on hand to use over the winter to mix with kitchen scraps.
# Additional Composting Information and Resources on the Web

**University of MN Extension**

- [www.extension.umn.edu/garden/yard-garden/soils/structures-for-backyard-composting](http://www.extension.umn.edu/garden/yard-garden/soils/structures-for-backyard-composting)

**Hennepin County**

- [www.hennepin.us/residents/recycling-hazardous-waste/organics-recycling](http://www.hennepin.us/residents/recycling-hazardous-waste/organics-recycling)

**City of Minneapolis**


**MN Pollution Control Agency**

- [www.pca.state.mn.us/living-green/start-composting-your-backyard](http://www.pca.state.mn.us/living-green/start-composting-your-backyard)
- [www.pca.state.mn.us/living-green/diagnosing-common-backyard-compost-problems](http://www.pca.state.mn.us/living-green/diagnosing-common-backyard-compost-problems)

**MN Composting Council**

- [www.mncompostingcouncil.org](http://www.mncompostingcouncil.org)

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**Contacts**

*Please contact us with any questions you may have!*

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