



UW | EXTENSION

# BACKYARD COMPOSTING

Using Simple,  
Small-scale Methods



**Karen Panter and Chris Hilgert**

Department of Plant Sciences

Revised from original bulletin B-974R  
by George F. Vance and Karen L. Panter

Revised  
November 2017

**B-974R**

B-974R  
Revised November 2017

## **Backyard Composting Using Simple, Small-scale Methods**

**Karen Panter**

**Chris Hilgert**

Steve Miller, editor, Tana Stith, graphic designer

*Issued in furtherance of extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Glen Whipple, director, University of Wyoming Extension, University of Wyoming, Laramie, Wyoming 82071.*

*The University of Wyoming is an affirmative action/equal opportunity employer and institution and does not discriminate on the basis of race, color, religion, sex, national origin, disability, age, veteran status, sexual orientation, or political belief in any aspect of employment or services. The institution's educational programs, activities, and services offered to students and/or employees are administered on a nondiscriminatory basis subject to the provisions of all civil rights laws and statutes. Evidence of practices that are not consistent with this policy should be reported to the Employment Practices Office at (307) 766-6721.*



## Backyard Composting Using Simple, Small-scale Methods

Composting is the process by which organic materials, such as yard and kitchen wastes, are decomposed into a dark-colored, nutrient-rich, soil-building conditioner called humus. In nature, this process occurs slowly when plant and animal materials decompose and their carbon and nutrients are returned to the ecosystem. By establishing a backyard compost pile, this biological process can be accelerated by managing temperature, oxygen, and moisture contents. The result is rich, earthy, sweet-smelling humus that can be mixed into garden beds, added to flower pots, or used as mulch for perennials and woody plants. It is an excellent and inexpensive organic soil amendment.

### Advantages of composting

Composting reduces dependency on fertilizers. Many synthetic fertilizers supply major nutrients in quick-release soluble forms, while others are slow-release. Long-term benefits of this method of fertilizing are limited. Plants need more than a few chosen nutrients. Incorporating compost into the soil adds long-term benefits by improving soil structure with organic matter. Dependence on synthetic fertilizers may lead to poor soil structure over time and may need more careful water management to prevent erosion.

The addition of compost alters soil pH. The ideal pH for growing most fruits, vegetables, and flowers is between 6.0 and 7.5. If your soil's pH is too alkaline (above pH 7), compost can help lower it. If your soil's pH is too acidic (below pH 7), compost can help raise it.

Composting recycles waste materials generated as kitchen scraps and yard products. By diverting materials from the waste stream, the need for more landfills is reduced.

Composting improves soil structure. Wyoming soils have textures that range from heavy clays to sands. Soil structure and nutrient status can be enhanced when organic matter is incorporated. Aeration is important to maintain soil productivity if soils are clay-like. Transforming minerals into useable forms is vital for nutrient uptake by plants. Organic matter greatly increases moisture-retention capabilities. Increasing the organic content of soils can conserve water. Organic matter added to soils acts like a sponge, soaking up and retaining water. Without organic matter, clay soils become hard and water tends to run off or puddle for long periods of time. On the other hand, sandy soils allow water to drain quickly.

### Variables for success

The amount of time necessary to produce compost varies, but if you are determined to be successful, the time is well worth the effort; however, there are several aspects to consider that will reduce the time and effort required to produce compost. These include:

- **Location** – Keep the compost pile out of windy areas so it won't dry too quickly.
- **Size** – The ideal size for a household compost pile is about 1 cubic yard (3 feet wide, 3 feet long, and 3 feet high). If too small, the pile will not heat up enough to kill weed seeds and other pests or work efficiently. If the pile is too tall, the weight will compact the pile and push out the air.
- **Water** – The pile should be about the consistency of a wrung-out sponge. If too wet, then too little air will be exchanged, and the pile may give off an offensive odor. If it is too dry, microbial activity may slow down enough decomposition is minimal.



- **Microorganisms** – Occasionally mix in some good garden soil or previously made compost to introduce microorganisms to your pile. The microorganisms digest the compost materials, which will heat the compost pile up to about 140 degrees Fahrenheit.
- **Air** – Providing plenty of air in your compost pile is important. This can be achieved several ways: turn the pile frequently (every week or two); use large twigs or poles layered alternately with the other compostable materials; poke deeply at the pile with a pitchfork or pole; or position your compost pile on chicken wire built at least 12 inches above the ground, which will allow the air to circulate around all sides.

### **Nutrient requirements and sources**

The best ratio of carbon to nitrogen (C:N ratio) for producing compost quickly and with a minimal amount of effort is between 25 to 30 parts carbon to 1 part nitrogen. A C:N ratio that is too high (too much carbon) tends to slow the decomposition process, while a low

C:N ratio (too much nitrogen) can lead to nitrogen loss as indicated by a strong ammonia smell. Try experimenting to find what combination works best for you. An old standby is to alternately layer equal parts of nitrogen, carbon, and soil.

Sources of nitrogen for the compost pile are identified as the “green” materials: green leaves, lawn clippings (with no herbicides applied), green plant wastes from the garden, and kitchen wastes.

Sources of carbon for the compost pile include the “brown” materials: dried matter such as grasses and hays, fallen leaves, sawdust, straw, or almost any other dried organic matter.

### **Location**

Sun, wind, water, appearance, and proximity to the garden are important factors when determining a site for your compost pile.

- **Sun** – The ideal place for a compost pile is in at least part sun, to ensure the pile heats up properly.

- **Wind** – Keep the compost pile out of the wind. This will keep the pile from drying too quickly.
- **Water** – Position the pile close to a source of water. The closer it is to water, the better you will be able to maintain the appropriate moisture content.
- **Appearance** – Locate the pile in an out-of-the-way site because neighbors could view a compost pile as an eyesore.
- **Proximity to garden** – Consider where the compost will be located with respect to where the compost will be used when it is finished. A wheelbarrow load of compost can be quite heavy.

## Methods to use

- **Quick** – The secret with this method is for all material to be as small as possible. Use a shredder or chop materials finely. The smaller the material, the faster the decomposition. Remember that fresh materials are nitrogen-rich. Carbon-rich materials should be added, as well as some soil, to introduce microorganisms. Add water to make the materials the consistency of a wrung-out sponge. Turn or stir every week or two to mix the composting material and increase aeration. This method should produce compost in a few months.
- **Medium** – Materials don't need to be shredded, but they must be layered. Alternately layer carbon, nitrogen, and soil. Turn the pile every three to four weeks. You should have compost in four to six months.
- **Slow** – Alternately layer carbon, nitrogen, and soil materials, and then just leave it alone. This method takes about one year. Check periodically for odor. You may need to add a carbon containing material or good garden soil to control odor.

## Composting for city dwellers

Apartment dwellers have even established compost piles on their balconies or in their kitchens. An easy method would be to use a 5-gallon pail with a tight-fitting lid. Use the quick method for best results.



## Materials to use and not to use in a compost pile

Some suggested items that can be used for compost materials are garden debris, kitchen wastes (but not from animals), shredded paper, leaves, hay, straw, grass clippings (no herbicides used of course), sod, and sawdust.

Materials that should not be used in the compost pile are: bones, meat scraps, fats, oils, animal manures or feces, human excretions, polyester materials, plastics, synthetics, diseased or insect-infested plants, any plant material treated with herbicides, poisonous plants, large woody plants (chop up first), and weeds.

## Potential composting problems

- **Pile too wet** – Add dry ingredients to absorb water and temporarily increase turning to once every day or two.
- **Pile too dry** – Add more wet ingredients and/or water so the pile is the consistency of a wrung-out sponge.
- **Pile not working** – The pile may be too wet, too dry, not warm enough. See variables for success above.





- **Offensive odor** – A strong ammonia smell indicates there is too much “green” nitrogen material in the pile; add dry “brown” carbon materials. A compost pile that is too wet becomes anaerobic and can smell terrible. Turning the pile can allow excess water to evaporate and remove the offensive odor.
- **Layers are matted** – Try to break up the mats, adding looser materials and/or soil; shred materials before adding them to the compost pile.
- **Flies or other nuisance insects** – Turn the pile more frequently and make sure there are no materials of animal origin in the pile.

### **Cold-weather composting**

Composting time typically takes longer because of Wyoming’s cold winters. For example, the cold air may not allow the compost pile to heat up adequately, thereby slowing the process. By covering the pile with a sheet of black plastic and adding more nitrogen-rich materials, you can maintain the proper temperature for decomposition (140 degrees Fahrenheit). Making your pile about 1 foot taller and wider (any length) will increase its insulation capacity to maintain a higher internal temperature.

### **Structures**

There are several types of containers available on the market or to construct at home. These are not necessary but can be very useful in maintaining a compost pile and confining it to an aesthetically pleasing area. Bins made of plastic are available in a number of sizes. Tumbling composters are also available. These are situated on a frame, and the round bin is tumbled periodically using a hand crank to mix and aerate the composting materials inside.

Materials for composting structures are virtually unlimited. Structures can be made from wood, wire, plastic, concrete blocks, bales of straw or hay, and more. Research the subject and talk with fellow composters to determine what style is right for you.

### **Compost uses**

- **Mix in garden beds** – The ideal time is when preparing beds for planting. It is not necessary to dig too deeply. The top 6 inches are ideal for nutrient uptake by most plants.
- **Prepare soil for new lawns** – Spread a 2- to 3-inch layer of compost over the area to be seeded or sod-

ded. Then, till it in to a depth of 6 to 8 inches. Seed or sod the area as planned.

- **Use as mulch** – Compost works very well as a top dressing for shrubs, trees, perennials, etc. As a mulch, the compost insulates and protects the plant roots from temperature extremes. It also provides nutrients that will be washed into the soil by rain and snow. A third benefit is the mulch helps manage weeds. If the plant roots are close to the surface, care must be taken to avoid injuring them. Be careful to leave room between the compost and the plant. If it touches the plant, new roots may begin to form where they contact the compost. It may also stay too wet, causing rotting of the base of the plant. For trees and shrubs, start about 1 foot away from the trunk and extend the application 6 to 12 inches beyond the drip line, except in turf areas. Three or 4 inches of mulch is sufficient.
- **Give it away** – If you are producing more compost than you can use, give it to your neighbors and friends. In turn, they may provide you with an endless source of ingredients for your next compost pile.

## Worms

Earthworms are naturally attracted to compost, which provides them food. Their tunneling is beneficial to aeration and improving soil structure, partially because earthworm castings are rich in nutrients required by plants. One pound of earthworms ingest 1 pound of waste organic matter and produce 1 pound of rich compost on a daily basis! They can significantly reduce the time necessary to produce finished compost. Care must be taken, though, to turn the pile at least weekly as the heat may kill them.

A worm box is recommended for indoor kitchen waste composting. It is best to purchase commercially grown red worms (*Lumbricus rubellus* or *Eisenia foetida*) for this project. They are sold as fish bait and are commonly called red hybrids or red wigglers. See the list of suggested readings below for in-depth information on composting with worms.

## Suggested resources

Barnyards and Backyards - <http://www.uwyo.edu/barnbackyard/resources/composting.html>. Accessed 8 July 2015.

How to Compost - <http://www.howtocompost.org/>. Accessed 8 July 2015.

Plant and Life Sciences Publishing - <http://palspublishing.cals.cornell.edu/>. Accessed 8 July 2015.

Appelhof, M. and M.F. Fenton. *Worms Eat My Garbage*. Kalamazoo, MI: Flower Press, 2003.

Trautmann, N.M. and M.E. Krasny. *Composting in the Classroom*. Kendall/Hunt Publ. Comp., 1997.

Campbell, S. *Let it Rot: the Gardener's Guide to Composting*. Storey Comm., Inc., 1998.

Biocycles Staff (eds). *The Art and Science of Composting*. J.G. Press, Inc. Emmaus, PA, 1991.

Ball, L. and J. Anderson. *Composting*. Workman Publ. Comp. Inc., 1997.

Nancarrow, L. and J.H. Taylor. *The Worm Book: The Complete Guide to Gardening and Composting with Worms*. Ten Speed Press, 1998.

Rynk, R. (ed). *On-Farm Composting Handbook*. NRAES-54, Plant and Life Sciences Publ., Ithaca, NY, 1992.

Gershuny, G. (ed). *The Rodale Book of Composting*. Rodale Press Inc., Emmaus, PA, 1992.

Vincent, W. *The Complete Guide to Working with Worms*. Atlantic Publ. Group Inc., Ocala, FL 2012.

