



# Composting and Mulching

*Created by Corrie Zoll, GreenSpace Partners, The Green Institute, for a Compost Workshop, February 2003. Updated by Gardening Matters in 2010.*

## Making Compost

### **Why should I make compost?**

Whether or not you're a gardener, composting is a common sense way to handle a significant amount of the waste you produce.

Think of it like recycling cans. You buy a can of Spam, use the Spam, and you're left with the can. The can is made of steel. That steel can be used again. That steel is much easier to reuse if you recycle it than if you put it in a landfill.

Your coffee grounds, vegetable peels, moldy bread, grass clippings, and fall leaves are also made from reusable materials. Like steel, these materials are much easier to reuse if you recycle them than if you put them in a landfill. But unlike recycling steel, you can recycle coffee grounds at home, and you can use the final product at home, too.

I think composting today is where steel recycling was 25 years ago. People know about it, people know it's a good thing to do, but there isn't much incentive to do it. As the amount of waste we produce increases, so does the cost per volume of disposing of that waste material. Cities can't avoid looking for new ways to keep waste out of landfills. I think composting will become as encouraged and as expected as recycling cans.

### **How does it work?**

In a compost bin, worms, insects, and bacteria literally eat the bulk material. What they leave behind is compost. Their digestive systems return the bulk material to a form from which plants can take up nutrients.

Like any living things, the worms, insects, and bacteria that make compost need three things: 1) Food, 2) Air, and, 3) Water. Food comes from the bulk material you are recycling. Air is introduced through vents or when you turn the compost. Water comes from rain, from wet materials you put on the pile, and from water that is added to the pile.

### **What about the smell?**

Properly maintained, compost should never smell bad. Usually, compost begins to stink when it's too wet. When the compost is too wet, the worms, insects, and aerobic bacteria don't have enough air to breathe. And so they leave.

In their place, anaerobic bacteria move in. These bacteria get their oxygen from water, not from air. And while we need these bacteria to do things like decompose dead animals, we don't want them in our compost pile because the waste they leave behind smells bad. Luckily, it's easy to get rid of these anaerobic bacteria by turning your compost and exposing it to the air. When the proper moisture level is reached, the anaerobic bacteria will leave and the aerobic bacteria will move in again. A perfect compost pile has the consistency of a damp sponge -- if you squeeze out a handful, you get just a few drops of water.

### **What can I compost?**

- Grass clippings
- Fall leaves
- Dead plants
- Vegetable peels
- Coffee grounds
- Old bread
- Leftovers
- Sawdust

### **What should I avoid composting?**

- Diseased plants (diseases may survive and spread to new plants)
- Meat, fish, eggs, milk, cheese (these attract anaerobic bacteria and other pests)
- Weed Seeds (try to keep these out so they don't sprout in your garden)

**Your compost pile shouldn't require  
more work than you want to put in it.  
Plan ahead for the sort of pile that suits you.**

### **The Low Maintenance Compost Pile**

- Make a pile in your yard.
- Turn it over once a year.
- Use the finished compost at the bottom of the pile (about a third of the pile will be composted)
- Return the unfinished material to the pile.

### **A Good Medium Maintenance Pile**

- Water your pile when you build it and whenever you water your garden.
- Layer different types of materials so they are better distributed through the pile.
- Leave a few sticks in the pile -- this increases airflow to the center of the pile.
- Turn the pile over three to six times a year.
- Most compost will be useable. Return the unfinished material to the pile.

### **High Maintenance Compost**

- Use something like a compost tumbler, turn your compost daily or weekly, balance the compost ingredients, and check the moisture levels.
- Try mowing leaf piles before incorporating them into your compost.
- Put compost through a chopper/shredder when it is halfway finished.
- Sift finished compost through half-inch wire mesh. Return unfinished material to the pile.

## Balance

The following is excerpted from [organicgardening.com](http://organicgardening.com):

**Carbon/Nitrogen (C/N) Ratio** Two kinds of organic matter are essential for a well-balanced pile: bulky, dry, high-carbon materials and dense, moist, high-nitrogen materials. The ideal C/N ratio for stimulating compost organisms is 25:1-30:1. Finished compost has a C/N ratio of about 10:1.

Material	% Carbon	%Nitrogen
Grass clippings, fresh	10-15	1-2
Fallen leaves	20-35	0.4-1.0
Newspaper or cardboard, dry	40	0.1
Wood chips or sawdust	25-50	0.1
Coffee grounds	25	1.0
Vegetable wastes, fresh, leafy	10	1.0
Vegetable wastes, starchy	15	1.0
Kitchen scraps	10-20	1-2
Fruit wastes	8	0.5
Seaweed, fresh	10	1.0
Weeds, fresh	10-20	1-4

1. Calculate your pile's Total Carbon Value by multiplying the percent carbon of each ingredient by the number of parts (by weight) of that ingredient and then adding up the carbon totals for all the ingredients.
2. Do the same for the nitrogen
3. Divide the carbon by the nitrogen to get the C:N ratio. If it's between 25 and 35, your pile should compost beautifully. If the ratio is higher or lower than that, adjust the proportions of ingredients to bring it into the range of 25 to 35 parts carbon for each one part nitrogen.

## Who are they kidding?

That formula works for some people, but *you don't need to go to these lengths to adjust your compost's performance*. A good rule of thumb is that "green" materials like grass clippings, weeds, and food waste are high in nitrogen (and they're often wet) while "brown" ingredients like dry leaves, sawdust, and straw are high in carbon. If your compost is going too slow, you might try adding some "Green" material. If your compost pile is too wet, you may need more "brown" material.

## When is compost done?

Your compost is finished when it becomes dark, crumbles in your hand, and smells like a nice bag of potting soil. You will likely have sticks, pieces of leaves, and other things in your pile that are not completely composted, and this is fine. Returning unfinished compost to a new compost pile is beneficial because the unfinished compost already contains large numbers of the bacteria needed to start your new pile.

## How do I use it?

Spread a two-inch to four-inch layer of compost to your garden beds in the spring or fall when no plants are growing. Your compost need not be completely finished to do this. If the compost is completely finished, you can use it to mulch around established plants. Too much compost around seeds or new plants might overwhelm them – it would be like using too much fertilizer.

## Is compost organic?

In order for compost to be considered “organic”, all of the materials composted must be organic as well. If you are using municipal compost or making compost in a community garden, it is difficult to control exactly what gets composted. Non-organic materials might be added to food or sprayed on grass clippings. If you work in a community garden that claims to be “organic”, you should check first before bringing in any compost. But most gardeners would rather take advantage of a local renewable resource than adhere to strict organic standards.

## What is the most dangerous thing that could be in my compost?

In very rare cases, certain types of agricultural herbicide can survive in municipal compost. The most notable case was in Washington State, when gardeners discovered that compost provided by the city killed their garden plants. This is unlikely to happen here, but no one can make any promises.

## What about worms?

Worm composting is a good way to compost indoors year-round in Minnesota. The book *Worms Eat My Garbage* by Mary Appelhof is a good introduction to worm composting, which is also called *Vermicomposting*.

While native worms do like compost piles (my father’s compost pile had the largest Night Crawlers I’ve ever seen), most vermicompost bins use **Red Worms**, also called **Red Wigglers**. These worms are native to warmer climates. Native Minnesota worms like cooler soil. When your compost pile starts to get warm, your native worms get lethargic and want to leave. Red Wigglers, on the other hand, get more active in warmer soil.

# Mulching

## Why should I mulch?

Mulch can do many things in your garden:

- If you mulch with compost or other organic material, it will decompose and add nutrients to your soil
- It reduces weeding by providing a barrier to block heat and sunlight from weed seeds. Weeds that do make it up through the compost are easier to pull.
- It reduces watering – Mulch can hold a lot of moisture.
- It keeps beds from getting hard, dry, and cracked in midsummer.
- It insulates the soil, protecting plants on hot days and cold nights.
- It reduces the need for tilling by keeping the soil soft and fertile.
- It controls soil contamination by providing a barrier between you and contaminated soil.

## **What can I use?**

A variety of materials can be used for mulch. The depth required for effective mulching varies with the material you use. Effective mulch will be thick enough to block out heat and light. A thicker layer of mulch will block weeds more effectively and for a longer period of time.

## **Compost**

Compost makes a good, all-purpose mulch. If you know that it's had time to finish completely, use it directly around bedding plants. This way, you get to block weeds, improve the soil, and fertilize all at once. If the compost is still "hot", it can be spread in garden areas not currently in use.

## **Wood Chips**

The great thing about wood chips is that you can get them free -- and delivered directly to your garden at no charge. Just look in the yellow pages under tree trimming services and call someone in your area. Careful using wood chips to mulch around plants -- they take nitrogen from the soil as they decompose. Eventually, when they are fully decomposed, the nitrogen is returned to your plants. A pile of wood chips will turn into compost in your garden in about three years.

## **Straw**

Straw is often available free after fall harvest parties or Halloween parties. Bales are compact and can cover a fairly large area. Straw is quite nice for scattering over grass seed to protect it while it sprouts. Remember that straw will probably also contain seed that will sprout in your garden. The good news is that these weeds are annuals and will be easy to pull.

## **Sawdust**

Sawdust makes great mulch. Lay it down in a solid layer at least two inches thick. And don't use sawdust that comes from finished or treated wood.

## **Rocks**

Rocks can be used as mulch for paths or other non-bed garden areas, but they're generally expensive. Rocks may look like they require less maintenance than other mulches, but don't kid yourself.

## **Plastic and Landscape Cloth**

Some people like to use black or clear plastic or landscape cloth under mulches. These can be used to form a barrier to block water and/or light from weed seeds. Black plastic can be used to heat soil for warm weather crops, or can be used to kill off everything under an area where you'd like to establish a new bed. But like anything else, these layers break down eventually. When they do, torn pieces and loose corners often stick up through your mulch layer unattractively.

# Some Questions to ask before you begin

- **How much material do I want to compost?**

The amount of bulk material you wish to process will affect the practices and bins you should choose. More material means more work, and more reward.

- **What materials will I compost?**

Will you be composting leaves? Grass? Food? Is it an annual or ongoing source? If you're adding food, you should consider rodent-resistant measures (1/4" wire mesh).

- **Do I need balancing materials?**

If you will be composting only grass or food, you might want to keep a stockpile of dry leaves or straw. If you are mainly composting fall leaves, you can speed things up by finding a source for food waste, coffee grounds, or clean grass clippings.

- **Where can I get complementary material?**

Try your neighbors, the alley, your local coffee shop, and Halloween parties

- **How fast do I want to compost?**

If you have a steady stream of new material or if it's mainly food, a no-maintenance bin may not be practical.

- **How much time do I have to put into this?**

Some composting methods require maintenance no more than three times per year. Other methods require weekly or daily attention. Some people will want finished compost once a year. With more effort, others will be able to make compost in only a few weeks.

- **What will I do during the winter?**

Your outdoor pile will cease activity during the winter. Will you have an ongoing waste stream like food scraps? You can stockpile the stuff frozen outdoors, but you'll need to deal with it in the spring (stockpile your leaves to balance them). You might also consider a worm bin for year-round food waste composting.

- **Do I care what my neighbors think?**

If your neighbors will be offended by an occasional smell, pay attention to the placement of your bins and make sure the pile doesn't get too wet

- **Is it organic?**

If you want organic, chemical-free compost, all of your sources must be organic. Consider what's been sprayed on your grass and your food. To most people, the practice of waste reduction is the most important factor. On a biodynamic farm, space is dedicated to growing plants for the sole purpose of composting them.

# Municipal Regulations for Home Composting

## In Minneapolis:

<http://www.ci.minneapolis.mn.us/solid-waste/compost.asp>, as of 3/18/10

- City Ordinance requires that compost piles be contained by some type of compost bin.
- City Ordinance requires that your bin be placed at least one foot from any property line, and 20 feet from any habitable building other than your own home.
- City Ordinance prohibits any compost bin larger than 5'x5'x5'.
- The space you can have for compost bins is limited by the size of your property as follows:
  - Lots less than 5,000 sq. ft. can have up to a total of 125 cubic feet of bins.
  - Lots between 5,000 and 10,000 sq. ft. can have up to a total of 250 cubic feet of bins.
  - Lots of more than 10,000 sq. ft. can have up to a total of 375 cubic feet of bins.

## In Saint Paul:

Chapter 357. Solid Waste. Residential Composting.

<http://www.stpaul.gov/index.aspx?NID=1060>, as of 3/18/10

(1) *Container.* Composting shall be conducted within an enclosed container(s) not to exceed a total of one hundred (100) cubic feet in volume for city lots less than ten thousand (10,000) square feet and one hundred fifty (150) cubic feet for lots greater than ten thousand (10,000) square feet, and five (5) feet high. The container(s) shall be of a durable material such as wood, block or sturdy metal fencing material.

(2) *Container location.* The compost container(s) shall be located at least five (5) feet from lot lines and be placed no closer than twenty (20) feet to any habitable building, other than the resident's own home, nor less than two (2) feet from the alley if any alley exists.

(3) *Materials allowed.* Only organic yard materials, including grass clippings, leaves, faded flowers, weeds, sawdust, wood ash and plant trimmings, lake plants, straw; kitchen scraps such as fruit and vegetable peels and trimmings, and other raw, nongreasy food wastes; and commercially available compost materials, may be placed in the compost container(s).

(4) *Materials not allowed.* None of the following materials shall be placed in the compost container(s): meat, bones, fat, oils, dairy products and other greasy kitchen wastes, whole branches or logs, plastics, synthetic fibers, human or pet wastes or heavily diseased plants.

(5) *Odors.* Compost shall be properly managed to minimize odor generation and promote effective decomposition of the material.