



# HOW TO COMPOST

- Make Black Gold in 6 - 8 Weeks
- A Successful Hot Composting Method & Alternatives

**THE GOAL** is to optimize the conditions for the workers (the microorganisms) to decompose and transform organic waste into rich finished compost in 6-8 weeks, using the hot compost method.

**SELECT A SITE:** Locate your pile near a water source and your garden, and away from neighbors. Consider wind direction and good drainage (no pit is necessary). To contain the heap, you can make or purchase a bin. Or you can simply build a pile. A floor of plywood will prevent weeds from invading the pile. Absolutely avoid using pressure treated lumber for construction (or chips in pile).

**OBTAIN RAW MATERIALS** Scavenge free “waste” found locally.

**DON'T ADD** this raw organic matter straight to the soil. If you do, it will rob nitrogen from soil while it decomposes, and add lots of added weed seeds. Compost these raw materials first!

**STORE RAW MATERIALS IN A STOCKPILE** until you have a cubic yard's worth (3' x 3' x 3') minimum.

**GATHER BOTH GREEN AND BROWN TYPES** of organic materials.

## ***BROWN or CARBON (C) RICH SOURCES***

Aged manure  
Manure with bedding  
Hay  
Straw  
Sawdust  
Dead leaves  
Dead, brown grass clippings  
Dead crop residues  
Shredded paper, newspaper

Should you chop or shred these materials? No, they will decompose, but if you can, they will decompose faster. Bacteria have small mouths!



## **GREEN OR NITROGEN (N) RICH SOURCES**

### **EITHER:**

- Coffee grounds
- Green grass clippings (without weed killers)
- Fresh manure (except horse manure if horse was de-wormed recently)
- Fresh crop wastes
- Fresh weeds: see the exceptions on the NO list. Chickweed & dandelion are okay.
- Fresh legume or “compost crop” cuttings, such as beans, clovers, field peas, vetches.
- Dog hair and human hair clippings without beautician chemicals
- Fish waste
- Kitchen food waste

OR: Supplement with an organic fertilizer. Choices are shown in ascending percentage composition of N:

alfalfa meal	2%
cottonseed meal	6%
fish bone meal	6%
soybean meal	7%
fish meal	10%
blood meal	12%



Note: when substituting with these nitrogen-rich meals or granulated fertilizers for green organic matter, use only a sprinkling on top the carbon layers as you construct the pile. If you choose blood meal with its very nitrogen content, you'll only need a dusting per layer. With alfalfa meal at only 2% nitrogen, apply this at about ¼” to ½” per layer.

Instead of one of the fertilizers above, you can use:

- unsulfured molasses --dilute 1 part molasses mixed well with 5 parts water, or
- fish emulsion or hydrolysate—follow dilution instructions on label.

Experiment with the quantity to stimulate the heating-up process you want.

### **OPTIONAL INGREDIENTS TO BUILD MINERAL CONTENT**

The following provide valuable minerals other than carbon and nitrogen.

- Ash from wood stove for potassium (K) and trace elements. Use only a dusting every few layers to prevent drastically pushing the pH balance too far to the alkaline extreme.
- Egg shells & clam shells for calcium & phosphate

### **NEVER USE AT ALL**

- Toxic materials: pressure treated wood, yard waste or crop residue with weed killer, bug killer, fungicides, etc.
- Ashes from charcoal grill (too many unhealthy ingredients in the charcoal)
- Pet manure and waste: dog, cat, bird. (Make a separate pile for these, & apply finished compost onto non-edible landscaping)
- Fats and cooking oils
- Large pieces of mea,
- Redwood and cedar chips, commercially grown Christmas tree chips
- Horsetail, quack grass, Canada thistle, horse radish, or comfrey. Any parts of these plants will multiply in your pile instead of die and decompose.
- Fruit pits: avoid simply because they rot so slowly.

## CONSTRUCT YOUR PILE: the layered cake!

Have enough stockpiled carbon-rich material to build a 3' x 3' x 3' pile all in one day. This means as soon as you get a windfall of nitrogen-rich matter (enough fresh green stuff), this is the day to build your pile.

1. Spread a base area 4' x 4' with a bottom layer of brown material about 4-6" thick.
2. Water well.
3. Now spread a layer of material from the green list, 3-4" thick, or a sprinkling of a fertilizer.
4. Continue alternating brown and green layers, constructing the pile like a layer cake.
5. Water each layer thoroughly before adding the next.
6. Continue stacking layers until the pile becomes at least 3' long, 3' wide, and 3' high.
7. Make the final layer a brown one, or cover with soil to reduce flies and odor.
8. Cover completely with a tarp or plastic to keep moisture in, and excess rain out.
9. Don't add any new materials now; let this pile finish...unless you must correct a temperature problem. You'll know in a few days. Start stockpiling for new heap.
10. Deter slugs with a ring of ash or diatomaceous earth surrounding the heap.

## A NOTE ABOUT CARBON TO NITROGEN RATIOS symbolized by C:N

Aim for an ideal ratio of 25:1. That means 25 parts of carbon to 1 part of nitrogen.

Horse manure is 25:1 on the average, so if you use just this, you will not have to adjust the C:N ratio if manure is fresh, meaning less than 4 days old.

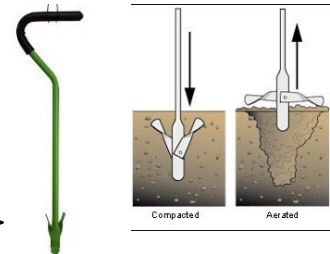
If you use leaves and grass clippings, the leaves average 80 parts of carbon to one of nitrogen. Grass clippings are about 20:1. So mix 1-2 scoops of grass with 3 scoops leaves for a good C: N balance.

Wheat straw C:N ratio around 100:1. Paper averages 170:1. Sawdust is around 500:1.

Summary: If you use highly woody resources, you will need several times more nitrogen source in your green layers to feed the microbes. To adjust, make thinner brown layers and thicker green layers.

## TEND THE WORKING PILE

1. Monitor the temperature of pile core with a 20" thermometer.
2. Make the first turn in 5-8 days. Thereafter, turn the pile every 3-5 days. Turning means to fluff, mix, and aerate with a pitch fork, ideally moving materials by re-building the pile on a new location, next to the old one. Or use a compost aerator tool (about the size of a cane)  $\Rightarrow$

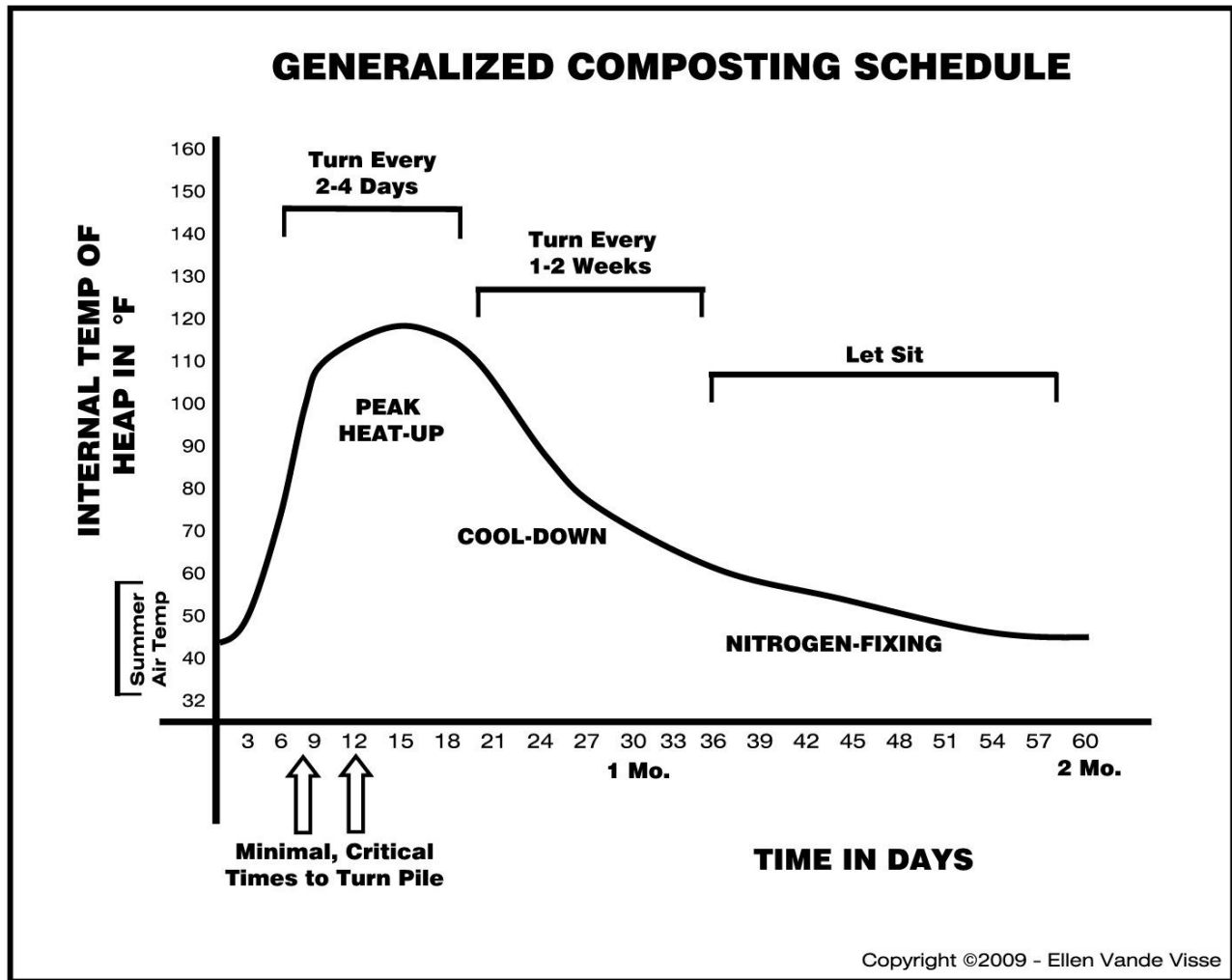


## ON THE FIRST TURN, CHECK THE PILE FOR

Moisture: Add water if there are dry spots, which look like ash. Keep moisture at 60%, or like a wrung-out sponge.

Temperature: Aim for a minimum of 120<sup>o</sup> F and a maximum of 160<sup>o</sup> F. For example, a temperature range that peaks at 120- 140<sup>o</sup> F would be very serviceable. Ideally, construct so that your pile obtains 135<sup>o</sup> F for 3 days to kill plant pathogens. Below 120<sup>o</sup> F, the pile decomposes more slowly. Above 160<sup>o</sup> F, desirable microbes die from too much heat. Above 180<sup>o</sup> F constitutes a fire hazard. Corrective measures: **if the temperature is too low, add more nitrogen source.** If pile temperature is **too high, immediately turn, moisten, and add more carbon-rich materials.** If the temperature suddenly plummets, the microbes have run out of oxygen and the pile has gone anaerobic. Turn the pile immediately. It will resume decomposition with the refreshed oxygen.

Air, odor, color: If the pile smells strongly of ammonia or barnyard, it has excess nitrogen, which is escaping into the atmosphere. Correct this by adding more carbon source. If the pile smells like sewage, methane, or hydrogen sulfide, and perhaps has a sickly yellow color, that means aerobic microbes in the pile have run out of oxygen and most have died. Anaerobic microbes have taken over the workload, but their by-products are smelly. Simply turn the pile to restore oxygen and thus aerobic microbe conditions.



### CONTINUE TURNING AND MAINTENANCE

1. Do not add any new materials unless you must further correct for an optimal C : N ratio and temperature range.
2. Continue monitoring temperature and moisture. Add more water if dry spots occur.
3. Continue turning the pile every 3-5 days while it is hot, and less often as it cools.
4. The pile will gradually darken in color and reduce to about ½ its original volume.
5. After pile cools to air temperature, let it sit another 2 weeks to completely cure.

**WHAT ABOUT WINTER?** Let it freeze and take a rest! A partially decomposed pile will resume when it thaws in the spring. Start a new stockpile for building a new and separate compost heap for the next growing season.

**IT'S DONE WHEN** it is about 6-8 weeks later, the core temperature has completely cooled, texture is crumbly, color is dark brown or black, you cannot recognize the original ingredients except the occasional piece of leaf or egg shell, and the smell is as sweet as a forest floor! Your product is stable humus. It is rich in available nutrients and beneficial microorganisms. When applied to the garden, these diverse soil food web members in the compost will steadily release those nutrients to your plants.

### APPLY YOUR BLACK GOLD

1. For spring soil preparation, spread compost 1-3" deep and cultivate. You may want to screen out large and unfinished items before spreading your compost.
2. To use mid-season on maturing crops and perennials, side-dress or mulch with it.
3. In the fall, cover the finished pile and save until spring. Don't let it leach nutrients all winter.

**CONGRATULATIONS!** You've just vastly improved soil structure, tilth, pH stability, essential mineral content, and fertility. You've just reduced insect and disease infestation, soil compaction, hardpan formation, and drought damage. You have practiced the ultimate in recycling, and you are an accomplished steward of your local ecosystem!

### ALTERNATIVES TO HOT COMPOSTING (& still build your soil food web)

1. **Worm composting** with red wigglers in a bin is great for small quantities of kitchen waste. It requires a warm location of 60<sup>o</sup>F -80<sup>o</sup>F.
2. **Cold composting** means letting your pile sit for a year or two without turning it. Watering helps! Decomposition happens anaerobically, but you'll get useful compost when it's finished. Remember that with cold composting, weed seeds will still be viable.
3. **Compost tea** (that is, actively aerated, properly brewed compost tea) is an excellent way to extend your compost supply. As a liquid, it is easily applied over large areas and also suppresses diseases. See [www.goodearthgardenschool.com](http://www.goodearthgardenschool.com) for information and the product.
4. **Soil ReVive + Soil ProVide** from Earthfort packages a compost tea with a stable shelf life and supplies the full count of beneficial microbes. Available at AK Mill & Feed, Anchorage.
5. **Manure tea** is made by soaking a feed bag of manure in a barrel of water a few days.
6. **Mulch** your plants and trees with grass clippings and wood chips. These organic materials feed microbes which, in turn, feed plants and trees, and hold moisture in the soil, too.
7. **Green manure/cover crops**-- this is the cheapest & best way, especially for farm-scale.
8. **Biochar** mixed with compost will vastly extend your compost longevity. Call 907-232-2252, [BiocharAK@gmail.com](mailto:BiocharAK@gmail.com)
9. **Buy compost** bagged or bulk from local suppliers.



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