May 15,1998, revised 2-25-09
Good Earth Garden School

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HOW TO COMPOST

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

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 to easily access a water source and the garden. Select a place in sun or shade (doesn't matter), 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 plywood sheet floor will prevent weeds from invading the pile. Absolutely avoid using pressure treated lumber for construction (or chips in pile).

GATHER BROWN and GREEN RAW MATERIALS (see below) First, scavenge brown materials. It's free "waste" found locally. Stockpile it until you have a cubic yard's worth (3' x 3' x 3') minimum. When you gather green raw materials**,** immediately construct the compost pile.

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

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

If you can chop or shred these materials, they will decompose faster. Bacteria have small mouths!

GREEN OR NITROGEN (N) RICH SOURCES

EITHER:

Green grass clippings (without weed killers)
Fresh manure (except horse manure if horse was wormed recently)
Fresh crop wastes
Fresh weeds: see the NO list; chickweed, dandelion are okay,
Fresh legume or "compost crop" cuttings, such as Kochia, clovers, peas, and vetches.
Hair clippings w/out beautician chemicals, dog hair
Fish wastes
Kitchen wastes

OR substitute: Organic fertilizers 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 nitrogen-rich powders for green organic matter, use only a dusting. The higher the nitrogen content, the more sparsely you'll need to sprinkle the powder. You can also use diluted unsulfured molasses or fish emulsion, but you'll have to experiment with the quantity.

OPTIONAL INGREDIENTS TO BUILD MINERAL CONTENT

If you have these items, add them in! They provide valuable minerals other than carbon and nitrogen.

Crushed clam and egg shells for Calcium (Ca)
Ash from wood stove for Potassium (K) and trace elements -(use only a dusting to avoid drastically pushing the pH balance to the alkaline end.)
Greensand for K
Bone meal or rock phosphate for calcium and phosphate (P_2O_5)

NEVER USE AT ALL

Toxic materials: pressure treated wood, materials with weed killer, bug killer, fungicides, etc.
Ashes from charcoal grill
Pet manure and waste: dog, cat, bird
Fats and cooking oils
Large pieces of meat
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: simply because they don't rot so slowly.

CONSTRUCT YOUR PILE: the layered cake!

Have enough stockpiled material to build the pile all in one day.

1. Spread a 4' x 4' area with a base layer of brown material about 4-6" thick.
2. Water well.
3. Now spread a layer of material from the green list, again 3-4" thick (or a dusting of organic fertilizer).
4. Continue alternating brown and green layers, constructing the pile like a layer cake.
5. Water each layer thoroughly before adding the next, (a wrung-out sponge moisture level.)
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—keeps moisture in, and excess rain out.
9. Don't add any new materials now; let this pile finish. 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 won't have to adjust the C:N ratio.
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 25% grass with 75% leaves for a good C: N balance.
Wheat straw averages 100:1. Paper has a C:N ratio around 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" composting thermometer.
2. Turn the pile every 3-5 days. Turning means to fluff, mix, and aerate with a pitch fork or a "stabber tool", ideally moving materials into a new location, next to the old one.

ON THE FIRST TURN, CHECK THE PILE FOR

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

Temperature: Aim for a minimum of 120^0 F and a maximum of 160^0 F. For example, a temperature range that peaks at 120- 140^0 F would be very serviceable. Ideally, construct so that your pile obtains 135^0 F for 3 days to kill plant pathogens.
If the temperature is below 120^0 F, the pile decomposes very slowly.
Above 160^0 F, desirable microbes die.
Above 180^0 F constitutes a fire hazard.
Corrective measures: if the temperature is too low, add more nitrogen source.
If it is too high, immediately turn, moisten, and add more carbon-rich materials.
If the temperature suddenly plummets, the pile has run out of oxygen and has gone anaerobic. Turn the pile immediately.

Air, odor, color: If the pile smells strongly of ammonia or barnyard, it has excess nitrogen, which is escaping into the atmosphere. It may be too wet. Add 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 do further correction for optimal C : N ratio and temperature.
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 to a rich black color and reduce to about ½ the 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 is completely cooled, texture is crumbly, color is dark, and the smell is as sweet as a forest floor! Your product is stable humus. It is rich in available nutrients.

USE 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.

CONGRATULATIONS! You've just vastly improved soil structure, tilth, pH stability, trace mineral content, and fertility. You've just reduced soil erosion, insect and disease infestation, soil compaction, hardpan formation, and drought damage. You have practiced the ultimate in recycling and stewarding your ecosystem!

ALTERNATIVES TO HOT COMPOSTING

1. Worm composting is great for small quantities of kitchen waste
2. Cold composting means letting your pile sit for a year or two without turning. Decomposition happens anaerobically, but you'll get useful compost when it's finished. Remember that with cold composting, weed seeds may still be viable.
3. Compost tea (that is, actively aerated, properly brewed compost tea) is an excellent substitute. As a liquid, it is easily applied over large areas and gets amazing results. See www.soilfoodweb.com or inquire about local brewers and aerated compost tea.
4. Mulch your plants and trees with grass clippings and wood chips.
5. Plant a green manure/cover crop and plow under before it matures.

SUPPLEMENT YOUR SUPPLY by purchasing commercially made compost.
Buy it bagged at local gardening stores. Bulk loads at composting site are sometimes possible.

IN ALASKA:
Anchorage --watch for a new compost facility and inquire about obtaining bulk loads.
Anchorage--***Alaska Humus*** at Alaska Mill and Feed, gardening stores, 258-1504.
Anchor Point --***Fishy Peat*** call 907-235-7288, Anchor Point Greenhouse