

Why Compost?

25.9 Million Tons of food discarded annually - Organic matter in landfills generates methane, a greenhouse gas 23 times as potent as carbon dioxide - Valuable resources wasted – Compost ingredients!

What is Composting?

“Unstable Feedstock (ability to change - e.g. rot, decompose, etc.) undergoing a Biological Process (microbial activity) resulting in a Stable End-Product”

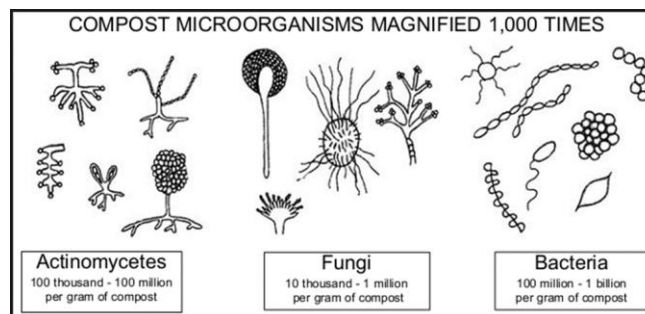
- Compost is a soil amendment (not fertilizer). The minerals within the compost are fertilizers

Ingredients (for traditional compost)

Nitrogen rich “**greens**” (Food Waste, Fresh Grass, Coffee Grounds) – Provide proteins, amino acids, enzymes

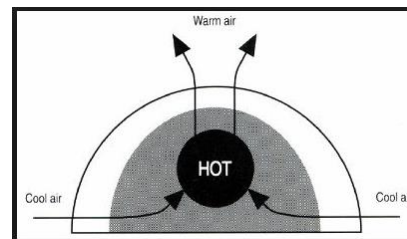
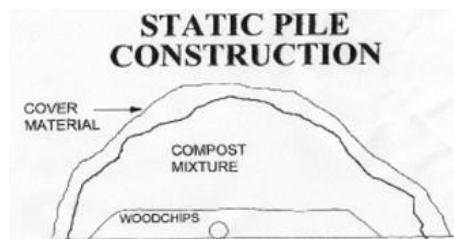
Carbon Rich “**browns**” (Leaves, Dry Grass, Wood Chips) – Provides energy and building blocks for cells

Who does the work?



<https://sabacooperative.wordpress.com/permaculture-compost-microorganisms/>

Pile Structure

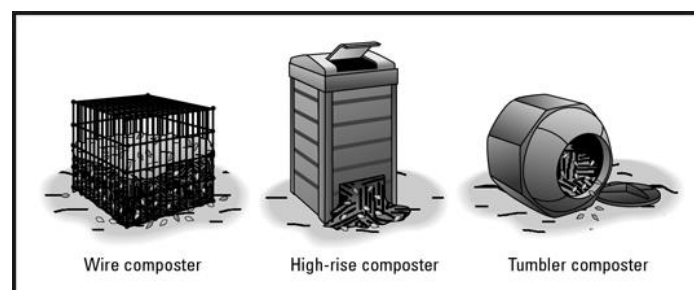


http://www.umass.edu/cranberry/pubs/bmp_composting.html

<http://articles.extension.org/pages/8859/passive-composting-of-manure>

- Optimal size of pile – 3’ x 3’ x 3’
- Layering – Mixture in the middle is activity center, cover material buffers heat, moisture and odor.
- Air flows in from the sides to the core then out the top. Water flows the opposite way.

Setup Options

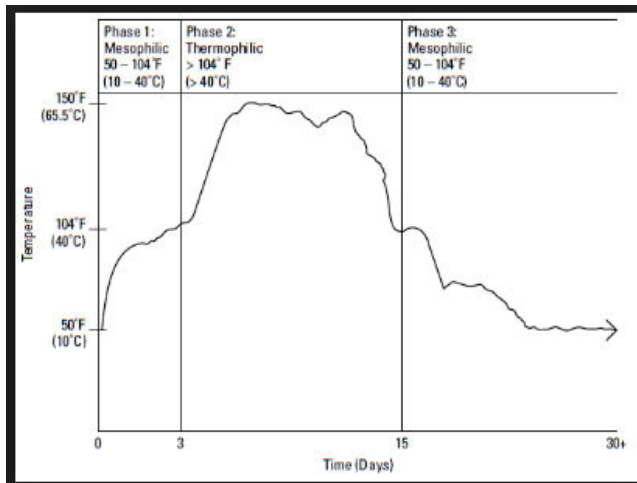


<http://www.dummies.com/home-garden/gardening/how-to-make-compost/>

Factors to Monitor

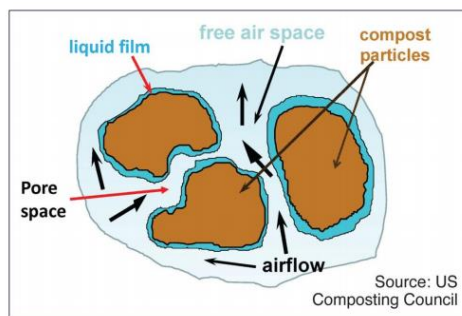
- Temperature

Optimal range between 130 and 140 degrees for active pile. Pathogen kill at 131 degrees



<http://pantryparatus.com/wilsons-book-review-composting-for-dummies/>

- Temp increases with microbe activity
- Curing reduces microbial activity – Microbes are better at absorbing nutrients than plants (“hot” compost will harm plants!)
- C:N Ratio
20-30:1 (Rule of thumb, 2 parts brown for 1 part green)
- Oxygen
5-10% (Active piles consume more oxygen. Turn pile and vary particle size to optimize)
- Moisture
50-65% (Squeeze Test: clumps but doesn’t drip)
- pH - Neutral
- Particle Size
¼ - 3 inch (Larger objects increase airflow, and create dryer conditions, but take longer to break down)



*Interaction of liquid, air, and surface area

Pile Management

- Turn pile once a week or if temperature hit 150 degrees or drops in temp without external cause (rain, weather, etc.)
- Eliminate compact zone, monitor even breakdown, add material as needed
- Troubleshoot – Moisture, Odor, Results

Bokashi

What is Bokashi?

The term bokashi means 'fermented organic matter' and is a Japanese method of recycling food waste that uses the process of fermentation (think sauerkraut) to break down material. It is not clear when bokashi was first used by farmers. Some say bokashi has been used by farmers since the 1940's while others say that it may have been around since during the early Edo period (mid 1600's) in Japan. The practice of making and using some form of fermented organic matter may have also been used in other cultures throughout the world in ancient times to the recent past. In urban environments, this process is done in air-tight 5-gallon buckets with the assistance of introduced activated microbes.

What can I add?

With bokashi you can not only add fruits, veggies, coffee grounds and egg shells to your bucket but oils, meat, and dairy items as well. Because the fermentation is taking place in an air-tight environment, these items will not go rancid before they break down.

How does Bokashi work?

Start with a 5-gallon bucket with air-tight lid and one pound of dried wheat bran that is infused with the activated microbes. You can make your own activated bran or buy it online. All you do is fill up the bucket with produce scraps, leftovers, and spoiled food, sprinkling in the bran mix as you go. Once full, keep the bucket closed for at least two weeks. The longer it sits the more complete the fermentation process. After that time the material can be trenched into the garden or incorporated into to a traditional compost pile. Easy!

Infused Bran Recipe

10 lbs. bulk wheat bran

10 cups of water

0.8 fl oz (1.6 tablespoon, or 24 mL) of EM1 (microbe liquid)

0.8 fl oz (1.6 tablespoon, or 24 mL) of black strap molasses



Add EM1 and molasses to water (mix to dissolve). Add water to bran in large bin mixing with your hands until bran clumps together but is not saturated (30% moisture). Place mixture in air-tight container for two weeks to allow microbes to bloom and multiply. After two weeks the mixture should be dried for long-term storage.

Troubleshooting

Too Dry Bokashi Bucket

- Need enough moisture for microbes to be active. There may not be any smell, or the smell is weak or mild indicating possible slow fermentation.
- Start adding liquids that would ordinarily be poured down the sink (cooking oils, spoiling milk, juices, soda, etc.)
- Generally, try to have a balance of wet (fruits, vegetables, sauces) and dry food waste mixed in.

Too Wet Bokashi Bucket

- The more watery and less oily, the more likely the liquid will oxidize (exposure to oxygen) and rot.
- Add dry materials to soak up the liquid, such as stale bread and paper (used paper napkin, paper plates, paper shopping bags, corrugated cardboard, etc.)—tear up the paper products; avoid waxy paper products

Not Enough Food For The Microbes

- To help maintain a better smelling bokashi bucket, add all of your leftover/used salad dressing, oils, sauces, vinegar, gravy, etc. to the bokashi bucket (instead of rinsing them off in your sink). What also helps are leftover drinks (juices, wine, beer, soda, etc.)
- These are rich in sugars/carbs, salts, minerals, etc. which the microbes love to eat.

Sustainable Jersey City runs a Bokashi bucket exchange program at St. Paul's Episcopal Church (440 Hoboken Ave Jersey City NJ). Please contact Tyler Randall (tylerc.randall@gmail.com) for details).

Worm Composting

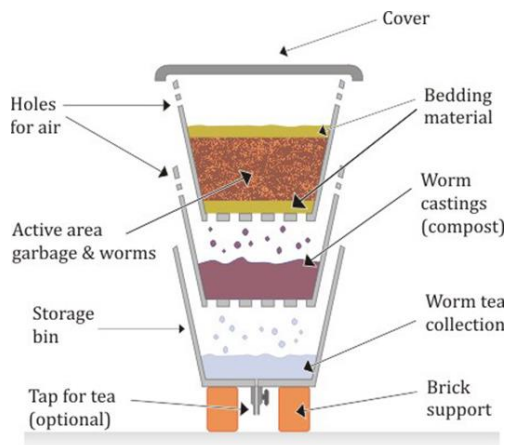
- AKA - Vermiculture
- Use Red Wiggler worms
- Two pounds of worms — about 2,000 wigglers — for every pound per day of food waste.
- Maintain temperatures in the 55 to 77 degree range – Move inside for winter

Process

- Create bedding out of moist newspaper
- Add something gritty such as a bit of soil, fine sand, leaves, cornstarch – aids digestion
- Add worms and leave for one week before adding food – the same items you'd compost
- Be sure to not over-feed (uneaten food will rot)
- Worms can be picky – monitor what they eat and don't eat

Containers

Containers can be as simple as a plastic storage tote with air and drainage holes, or they can be purchased.



Zones: Active area, casting (compost) collection, excess moisture collection

Troubleshooting

Common problems:

- Odors – reduce feeding amount, mix food within bedding, unblock drainage holes
- Fruit Flies – Mix food into bedding
- Worm migration – Ensure foods are not too acidic and bedding does not get too wet.

Resource: <https://www.planetnatural.com/worm-composting/>

Remember - While composting in the various forms provides a sustainable method for processing food waste, the best solution to address food waste is to not create it in the first place! Follow SJC's guide to reducing food waste to save money, time and resources for you, your community and the planet.