

# Neighborhood Soil Rebuilders

## COMPOSTER TRAINING PROGRAM



## Best Management Practices for Community Composting Sites

Well-run composting demonstration sites, or sites that are open to visitors, are critical to improving people's understanding of what good compost is and how it is made. Such sites can help garner support for composting from neighbors, the general public and policymakers. But, regardless of whether or not your site is open to visitors, good site hygiene will be critical to your success. The NSR Composter Training Program advocates for the following best management practices for small-scale composting sites:

### Before You Get Started

- ✓ Unwanted critters are avoided through use of rat-resistant composting systems and proper storage of **feedstocks**, or compost ingredients, and compost at all stages. Rat-resistant systems will employ hardware cloth, paver stones, crushed concrete, thick **biolayers** and other features to prevent access to food scraps.
  - For community-based composting projects in urban areas or other places where pest pressure is high—particularly where volunteers make up most or all of the labor force—the use of fully enclosed bin systems can help make pest management a little easier.
  - If using an open pile system, it is particularly important to fully cover, or **cap**, any active compost piles with a **biolayer**: at least 2 inches of finished compost, at least 6 inches of unscreened compost, or 12 inches of wood chips to prevent pest problems.
- ✓ Provide space for each step of the composting process (i.e., carbon storage, feedstock handling, curing area, screening area, finished compost storage, etc.). Keep in mind that your finished or curing piles should always be upslope from any active piles.
- ✓ Nothing involved in the composting process (tools, feedstocks, compost systems, active compost piles, curing or finished compost piles) should ever sit in standing water, and water that may run through the compost site should never run directly into a waterway. Instead, it should run into a meadow, a berm, a filter, or a sewage drain (but not a storm water drain!).
- ✓ Educational signage and proactively engaging the community surrounding your composting project are key to gaining support and meeting any concerns regarding your project head-on.
- ✓ Composting sites should only be active if at least one operating manager is in place. The level of attention and effort available will determine how much and what types of materials your project can process.

### Getting Started

- ✓ Start small and simple! Regular and active management will generally allow your site to maximize what and how much you can compost. But, building new piles and turning existing piles are likely to be the most labor-intensive part of your project—be realistic about what your team can manage!
- ✓ It is essential to have an adequate supply of carbon-rich material on hand when composting wet and putrescible food scraps. Unlike high-nitrogen green materials, browns can and should be stored onsite in some manner.

## Managing Your Compost

### Odors & Pests

- ✓ Food scraps should only be added to the composting system raw or fermented (using a process such as *Bokashi*). If they must be stored and fermentation is not possible, food scraps should be immediately mixed with enough browns to soak up any liquid and prevent anaerobic conditions—that is, a starved oxygen environment that leads to odors—and secured from unwanted pests.
- ✓ Always make sure there is a biolayer of course browns, like wood chips or straw, at the bottom of your pile. This layer will filter odors that could attract pests, soak up liquid from the feedstocks being used, and allow air into the pile. A layer 4 to 6 inches deep is ideal.
- ✓ Biolayers are important for managing odors and fly problems even in enclosed bin systems, but in open piles they are the only protection from unwanted critters. Cover your pile with a layer of browns (wood chips are ideal) to keep flies out and smells down.

### Mixing and Shaping Your Pile

- ✓ For every 1 bucket or wheelbarrow of high-nitrogen green material, add 2 to 3 buckets or wheelbarrows of high-carbon brown material—use the same size container for measuring both greens and browns!
- ✓ The ideal bulk density of a material mix for composting is lighter at ~800 pounds/cubic yard. Browns serve as a bulking material to decrease density and increase air space in the pile. One ideal mix of browns, courtesy of Earth Matter in NYC, is 3 parts leaves, 2 parts wood chips/ chopped plant stems, and 1 part wood shavings/sawdust.
- ✓ Fresh ingredients such as leaves and straw are hydrophobic, meaning they repel and shed water. Shower water slowly as you mix the pile to allow materials to slowly soak up water, as opposed to just pouring water on the pile.
- ✓ Why create a dome shape? So that it's highest in the middle. The middle of the pile is where the most microbial activity will take place and thus where the most heat will build up. If a pile is built in the shape of a cube, the corners or shoulders will never heat up leading to inconsistent composting.
- ✓ A more thorough mix can be achieved by mixing on a tarp or a mixing bin before transferring to the system—mixing in a bin can make mixing large amounts of heavy material easier, too.
- ✓ Thorough mixing when building a compost pile coupled with thorough and regular remixing during the active composting phase will speed along the process and create a higher quality finished product with less chance for nuisance issues along the way.

### Monitoring & Recordkeeping

- ✓ Tracking temperature, moisture, and odors AND regularly mixing or turning are required for active or hot composting
- ✓ Use compost thermometers, the hand-squeeze test, and your nose to gauge and record temperatures, moisture content, and odor levels throughout the composting process. Allow these measurements to guide the process.

### Turning & Remixing

- ✓ The first 3 weeks of composting is considered the active phase. Weekly turning is recommended during this period, but at a minimum piles should be turned after the temperature peaks. After the active phase, piles can be turned once or twice a month.
- ✓ When you turn a pile, your goal should be to move what was in the outside of the pile to the middle, and what was in the middle of the pile out.

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### Pathogens & Contamination

- ✓ Active management includes meeting Process for Further Pathogen Reduction (PFPR) guidelines for thermophilic composting, and avoiding pest and nuisance odor issues. Active management is strongly recommended at sites accepting large amounts of food waste from off-site.
- ✓ To meet PFPR:
  - Material composted in enclosed systems must be maintained at a minimum average temperature of 55° C (131° F) or higher for 3 continuous days, followed by at least 14 days with a minimum of 45° C (113° F).
  - Passively aerated and windrow style piles need to keep material at a minimum average temperature of 55° C (131° F) or higher for at least 15 days (they don't need to be consecutive days). During this period, there must be a minimum of five turnings with a minimum of 3 days between turnings.
  - We further recommend 153° F as the ideal temperature to reach for at least 3 continuous days/15 nonconsecutive days.
  - Everything in the pile must hit these temperatures—that means that these temperatures must be reached after new material has stopped being added.
- ✓ Water that comes in contact with raw food waste or actively composting piles, should be minimized. But what is produced should drain away from edible plants and curing or finished compost, into a field, berm, rain garden, or bioswale.

### Finishing & Testing

- ✓ In unfinished compost, bacteria compete with plants for nitrogen in the soil, continue to consume oxygen—reducing the availability of oxygen to plant roots—and can also contain high levels of organic acids. These will all stunt plant growth. Curing is necessary to allow the compost to gradually complete degradation to produce a more chemically stable finished product.
- ✓ Water may no longer need to be added, as the moisture level only needs to stay around 40% (remember the hand-squeeze test!). Curing piles should continue to be turned twice a month, or at least monthly. A minimum of 4 weeks is needed for curing but 2 to 4 months is preferable.
- ✓ Finished compost will appear dark brown and crumbly. Original material feedstocks should not be recognizable with the exception of a few wood chips (which can be screened out). It will smell earthy. The internal temperature will match the outside temperature.
- ✓ Regular compost quality testing is recommended for any site that is: producing compost for sale, creating large quantities of compost for food production, or accepting materials that have the potential for pathogens (such as manures, meat, and large amounts of food waste from off-site).

### What to Avoid!

- ✓ **Select feedstocks:** While all organic materials are compostable, certain items should not be accepted at urban community-based sites. Fats, oils, greases, dairy products, meats, bones, seafood, pet wastes, and chemically treated grasses and yard trimmings hinder the composting process, attract pests, create odors, and/or contaminate the composting system. These materials should only be accepted where systems that are designed to handle these materials and are managed by very experienced operators.

- ✓ **Exposed food scraps:** Even acceptable food material can promote pest and odor issues if left exposed. Composters should make sure that all food is well covered with finished compost or a carbonaceous feedstock such as wood chips.
- ✓ **Odors:** Odor control is critical to advancing community-based composting. Maintaining aerobic (adequate oxygen transport) conditions in the composting system (e.g. by using the correct C:N ratio, mixing wet feedstocks with porous bulking amendments, consistently turning or aerating the composting system) is key to controlling odor.
- ✓ **Pests:** Controlling odors will help control pests. Following all of the above guidelines and preventing the system from going anaerobic should be the goal. The key is to create favorable, aerobic conditions for the microorganisms within the composting system, not for outside critters. Operators should always ensure their site and tools are left clean with no visible food and that all vector deterrents on their composting system are securely in place (e.g. bins locked, hardware cloth fastened, holes repaired).
- ✓ **Contact and stormwater:** Maintain sites with good drainage in order to avoid pools of standing water, which can cause odors and attract mosquitoes and other unwanted pests. Composters can also implement proactive watershed protection measures by installing a buffer (e.g. a vegetated filter strip or compost or wood chip berm) between the composting system and any surface or groundwater resources to intercept potential **contact water** (this is water that has contacted raw feedstocks or actively composting materials).
- ✓ **Unsanitary practices:** Composting systems are resource recovery sites, not waste disposal facilities and should be treated as such. Always maintain a clean, safe, and friendly environment. Composters, as sustainability stewards, should respect themselves and all site visitors by wearing protective gloves while composting and washing their hands to avoid the spread of bacteria when finished.

## Health & Safety Considerations

Adapted from <http://greenmountainfarmtoschool.org>.

- ✓ Hands should be washed after gloves are removed. Anyone with cuts and abrasions should cover them with bandages and wear gloves.
- ✓ Protect those likely to be most sensitive. Involve participants and guardians where appropriate to discover anyone potentially susceptible (those with allergies, asthma, weakened immune systems or who are infection prone).
- ✓ Control exposure of these individuals by restricting who actually comes in contact with the compost. Other individuals could feed the compost bin or take samples. Do not stir or otherwise disturb the pile or bin when people susceptible to inhalation of allergens are nearby.
- ✓ Though most people will not be affected, *Aspergillus fumigatus* is a common fungal strain that can become airborne that susceptible individuals may be sensitive to. Maintaining proper moisture, regularly turning & mixing (avoiding windy days), and watering while mixing will help minimize exposure to healthy individuals that are physically able to manage the compost.
- ✓ Turning the compost pile will release airborne particles and gases that can cause symptoms in some people. So if a pile is turned, be aware of the wind direction and of the susceptibility of those nearby and those doing the turning. Susceptible individuals should not turn the compost.
- ✓ Keeping food scraps covered with high-carbon materials will keep down flies and dispersal of fungal spores. Make sure you always have high-carbon materials in storage or in a bin.
- ✓ If the temperature of the compost pile is properly maintained, the risk of pathogens is decreased. Be sure to monitor temperatures and turn the pile frequently.