

ENVIRONMENTAL EDUCATION IN THE COMMUNITY GARDEN

LESSON 9

COMPOSTING WITHOUT THE NUISANCE

Composting methods for the kitchen and home gardens provide numerous containers and decomposition methods. Once thought of by many gardeners as a messy, rodent-attracting process that could only be successful in a large yard or garden, there are many tips and techniques gardeners can learn to create fly-, gnat- and odor-free small-scale compost at home or in the community garden.

Compost recycles carbon and organic matter from dead plants back into the soil through the decaying action of bacteria and fungi. Just like healthy garden soil, healthy compost is alive with bacteria and archaea, fungi, nematodes, and protozoa. Gardeners are adding both nutrients for plants and valuable soil biology when they develop a successful composting system that cultivates soil biology and nutrient retention. While organic matter will decompose on its own without any human intervention, the process takes much longer than a gardener usually wants to wait. Accelerating and controlling the composting process allows gardeners to minimize both the space, effort, and finishing time needed to turn decayed materials into nutrient-rich soil.

Gardeners can determine which type of compost system best suits their needs and space options. Urban community gardeners might need to use a worm-bin at home, and then bring the finished compost to their garden plot. Options for easy compost systems include: an outdoor layered compost structure, manufactured compost containers or tumblers, and worm bins.

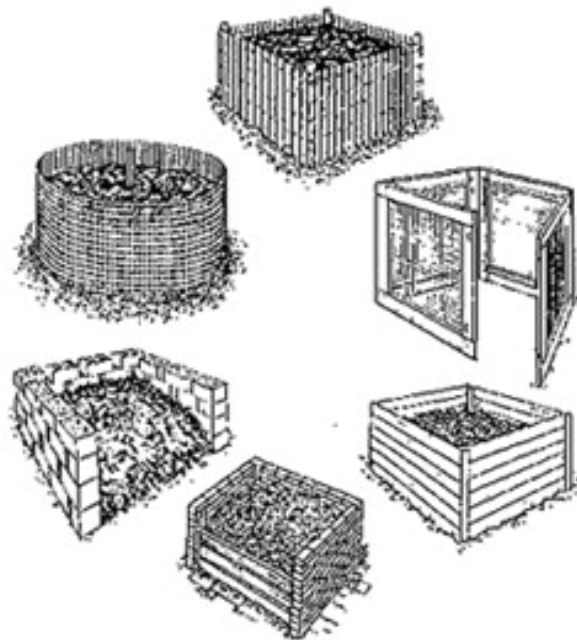
The best way to ensure that a compost system does not become smelly or swarming with gnats is to make sure that aerobic bacteria can thrive with adequate air circulation and a hospitable temperature range.

COMPOST PILES

The pile system of composting works well in a farm environment as a large, uncontained heap that is turned over from time to time to adjust air circulation, moisture, and temperature. Many cities require that compost piles be contained in some way to deter rodents from making comfy homes for themselves.

Gardeners can build easy, inexpensive containers for compost piles using cinder blocks, untreated wood, hardware cloth, or chicken wire wrapped around fence posts. These options allow air and water to reach the pile while providing gardeners with easy access to the pile for turning, adding ingredients, and monitoring temperature.

Many municipalities sell manufactured enclosed bins and additional pre-built options are available online. Gardeners will need a pitch fork of some sort to turn the pile and a good compost thermometer to monitor the pile as it heats up to 140 and 150F. The pile should not rise above 155 degrees because it will then begin to burn off carbon. Turning the pile acts as a catalyst to heat the pile when it is too cool, and cool the pile if it gets too hot. The pile will need to stay between 104 and 131F for the maturation stage.



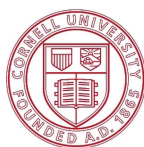
Contained compost pile options.

TUMBLER BINS

Tumbler bins are popular alternatives to compost piles because they allow gardeners to easily turn the compost without needing a pitch fork and heavy lifting. Gardeners will need to alternate the addition of fresh plant materials with brown materials such as dried leaves to maintain a balance between bacterial and fungal activity in the tumbler. The door also needs to be opened frequently to make sure that oxygen is able to circulate through the compost pile and that temperatures remain in the desired range for bacterial and fungal activity to speed up the decomposition process.

VERMICOMPOSTING

Worm bins, or vermicomposting, allow gardeners to build a contained ecosystem for worms to shred and digest compost and cycle nutrients through their waste. The name "worm bin" ends up being misleading because the container actually becomes more of a "living decay bin" where living organisms thrive on decaying organic matter. Worm composting is an easy way to create garden ready soil on a small scale in a short amount of time. With proper maintenance, it is an excellent way to recycle food waste back into the garden without the mess of flies, gnats, and anaerobic smells.



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LESSON PLAN 9

BUILD A WORM BIN

OBJECTIVES:

Show gardeners how to make an easy vermicomposting system at home with plastic totes.

Emphasize the benefits to soil biology: feeding the soil life is the best way to feed your plant life, and in turn to feed the gardener with produce from the garden.

MATERIALS NEEDED:

- One large plastic storage tubs 24 " deep or less with lid (BPA free plastic), wash out in advance and let dry
- Drill with 1/8th in bit for making holes
- Fiber bedding options: Shredded brown paper, newspaper, unbleached corrugated cardboard, straw, sawdust, coconut pith, or dry grass clippings.
- Two to three cups of good garden soil
- Water for moistening
- One pound of worms such as Red Wigglers (*Eisenia fetida*)
- An example tub with an established worm population, if available.

ACTIVITY:

1. Drill 1/8 holes around the sides of the bin.
2. Line the bottom bin with at least 4 inches of a fibrous material (unbleached paper, straw, grass, cardboard, etc.).
3. Cover bedding with a layer of soil to inoculate the bedding. Many people believe that "worms eat garbage" or food scraps, but they actually primarily eat the fungi and bacteria that feast on rotting food. Without fungi and bacteria inoculating a bin filled with food scraps, the food rots and smells before it is able to be turned into something the worms can process. The inoculation would happen naturally over time, but if they inoculate initially with garden soil and/or active compost, gardeners can skip the super smelly stage. .
4. Moisten bedding and soil thoroughly with water without flooding.
5. Add worms once the bedding has rested and moistened.
6. Show gardeners an example of an established worm bin and explain tips and techniques for feeding and harvesting the worm compost.
7. Demonstrate techniques for harvesting compost by gently separating worms from compost. The much slower, but equally effective method, involves pushing compost to one side of the bin, placing fresh food in an empty space and waiting for the worms to move out of the compost and toward the new food.



Uncovered worm bin tubs with holes.
Image source: www.growrealfood.com

HOW TO TAKE CARE OF YOUR WORMS

- Feed the worms! Red wigglers can eat more than half their body weight in food in a single day. It is best to begin ramping up the feeding levels slowly as the worms begin to reproduce. Gardeners can begin by feeding a small amount once a week in the beginning and then build up to a quart of scraps per square foot of soil surface per week.
- The worms will process kitchen scraps more quickly if gardeners cut them into finer particles before mixing into the bedding. Excellent food scraps for worms include vegetables, bread, coffee grounds, grains, fruits, egg shells, and tea leaves.
- Mixing the scraps into the bedding rather than simply laying them on top will deter fruit flies and fungus gnats, as well as unpleasant odors.
- Show gardeners how to monitor moisture in the bin and discuss when to add moisture or fresh bedding materials as the worms reproduce and increase their composting capacity.
- Watering bins with a rosette-nozzled watering can will help maintain moisture and an environment that feels as wet as a wrung-out sponge. Keeping the surface dry in addition to burying food scraps when adding them will help deter fruit flies and fungus gnats. Add dry carbon-rich materials if the bin becomes too wet.
- Worms prefer a cool to moderate temperature between 30 and 90F.
- Make sure to feed worms the amount and types of food that keep them healthy. Gardeners should avoid feeding their worms citrus, meats, fish, fats, dairy products, animal feces, and large twigs or branches.
- Gardeners should note that earthworms cocoon look like small yellow-orange seeds and newly hatched worms are tiny and white (not to be confused with maggots).
- Gardeners can also expect to see other organisms such as pill bugs appear in the worm bin over time. These bugs help break down organic matter into sizeable chunks that are more easily colonized and broken down by the microbes, which are then eaten by the worms. Too often gardeners see pill bugs in the worm bin and think there is something wrong.
- After 3 to 6 months, the happy worms will produce excellent compost to use for making compost tea or adding directly to the garden.

