Backyard Compost Workshop

What’s in your compost pile?
DECOMPOSERS IN A COMPOST PILE

Compost is produced through the hard work of a number of different decomposer organisms that break down organic material and convert it into finished compost. These decomposers are naturally present on the organic materials that you add to your compost pile, and also exist in the areas surrounding your compost system.

COMPOST ECOSYSTEM

Decomposers in a compost pile are part of a complex compost ecosystem in which food, water, air, and shelter are provided by the material within the compost pile. If any of those essential ingredients are missing, the organisms either slow down or stop working altogether. This web of interdependence is the driving force behind the production of compost.

Some organisms feed on decomposing plant materials, while others feed on other organisms. The two main categories of decomposers are chemical and physical decomposers.

**Chemical decomposers** work by using chemicals in their bodies to break down organic matter into simple compounds for energy. This is similar to how the acids in our stomachs dissolve the food we eat. Chemical decomposers are mostly microorganisms that cannot be seen without a microscope. Examples of chemical decomposers include bacteria, protozoa, and fungi.

Bacteria are the most abundant of the microorganisms found in a compost pile and perform the majority of the decomposition. An important by-product of their work is the generation of heat, which can warm up the pile and attract other heat-loving organisms to assist with the breakdown process.

**Physical decomposers** work by feeding on the organic materials in a pile. Similar to how we use our teeth to break up large pieces of food, physical decomposers chew, grind, and squeeze the materials into smaller pieces. After digestion, they excrete waste products which are then broken down even further by the chemical decomposers. Physical decomposers are mostly macroorganisms that can be seen without a microscope. Examples of physical decomposers are worms, mites, flies, and snails.

Earthworms do a large amount of the decomposition work among the macroorganisms. Several species of worms dig tunnels and feed on the decomposing materials in the compost pile. The spaces that the worms create as they move through the compost pile allow air, water, and nutrients to circulate, creating the necessary conditions for many of the other organisms to thrive.

COMPOST FOOD WEB

All of the decomposer organisms in the compost ecosystem are linked by a “what eats what” food web, wherein organisms are classified according to what they eat. There are three levels of consumers in the compost food web: primary, secondary, and tertiary. This web structure keeps the different populations under control and maintains a healthy and balanced compost pile.

**Primary (first level) consumers** feed directly on dead plant materials (and other decomposers that have died) in the compost pile. This group consists of chemical decomposers such as bacteria and fungi, but also includes larger physical decomposers such as snails, slugs, beetle mites, worms, and flies.

**Secondary (second level) consumers** feed on primary consumers and their waste products. This group consists of physical decomposers which include springtails, mold mites, nematodes.

**Tertiary (third level) consumers** feed on secondary (and sometimes tertiary!) consumers. This group consists of fast-moving consumers which include centipedes, pseudoscorpions, predatory mites, and rove beetles.

The NYC Compost Project, created by the NYC Department of Sanitation in 1993, works to rebuild NYC’s soils by providing New Yorkers with the knowledge, skills, and opportunities they need to produce and use compost locally. Learn more at nyc.gov/compostproject.
Decomposer organisms in a compost pile are an important part of the complex ecosystem that is required to decompose organic waste. Within this ecosystem, decomposer organisms are classified according to what they eat, or consume. The structure of this food chain keeps different populations under control, maintaining a healthy and balanced compost pile.

The decomposer food chain shows decomposer organisms according to what they eat and what eats them. Follow the guide below to identify decomposers in your compost pile and learn who may be eating whom.
Why Compost?

- Most efficient way to reduce food & yard waste
- Sustainably “closes the loop”, returning nutrients to the soil
- Mitigates climate change
  - Organics in anaerobic environment of landfill \(\rightarrow\) methane production
- Reduces water pollution
  - Landfills leak toxic leachate
- Finished compost = gardeners’ “black gold”
  - Reduces the need for chemical fertilizers
  - Suppresses plant diseases and pests
  - Promotes higher yield
  - Improves water retention in soil & reduces erosion

Essential Habits for a Successful Backyard Compost Bin

Following these basic rules will go a long way in maintaining an effective compost pile. Most common problems – such as wildlife infestations, unpleasant odors, and slow rates of decomposition – can be avoided or remedied by adhering to these guidelines. For more information, visit www.BoulderCountyRecycles.org.

1) **Keep a 50/50 ratio of “browns” and “greens” by volume in your pile at all times.** If you add a handful of kitchen scraps (which are “greens”) to your pile, you’ll need to toss in a handful of “browns” (like dried leaves). This means you need to keep a stash of browns handy at all times.

2) **All materials going into your bin must be cut down to 1”-2” in size.** This is the ideal size – smaller isn’t better! There are some exceptions to this rule; for instance, coffee grounds are small particles, but are great for your bin in moderation.

3) **Feed your pile a balanced diet of greens.** In other words, no single food item should be the bulk of your bin’s “greens”. Usually this isn’t an issue, as the average household produces a variety of food scraps. This mostly applies to greens. While a variety of browns is great (dried leaves, dried grass clippings, twigs/sticks, etc.), dried leaves can be used as all your browns.

4) **Don’t “dump and run”.** Dumping your kitchen scraps on the top of your compost pile and walking away is the worst thing you can do, generating odors and attracting wildlife. Instead, when you head outside with your kitchen scraps, do the following:
   a. Remove the lid of your bin
   b. Dig a little pit in your compost pile
   c. Empty your kitchen scraps into the pit
   d. Add an equal volume of browns
   e. Cover up the material you’ve just added
   f. Put the lid back on

5) **Keep your pile damp as a wrung-out sponge, and turn often.**
   a. Turning should be done once a week, or once a month at the very least. When you head out to turn your pile, bring the garden hose over, stick it in the pile, and soak it for a minute or so.
   b. Then mix, mix, mix with a pitchfork.
   c. Grab a handful of stuff from your bin. Squeeze. When you let go, it should stick to your hand a bit. If water runs down your arm, it’s too damp (but will dry out in no time!). If nothing sticks to your hand, it needs to be watered and mixed again until it is damp as a wrung-out sponge.
What are Browns and Greens?

Food for your compost pile!

50/50 mix by volume
1-2” sized pieces

Browns (Carbon)
Dry, Woody, Crunchy

✓ Dried fallen leaves (ok to have all browns from this)
✓ Dried grass clippings
✓ Brown garden waste
✓ Twigs and sticks
✓ Small woodchips and pieces (not chemically treated)
✓ Straw
✓ Dried out animal bedding
✓ Natural fibers like cotton, linen, & wool (cut into small pieces)
✓ Dryer lint
✓ Shredded cardboard containers
✓ Newspaper (1” strips, no glossy ads)
✓ Dried pine needles (only small amounts)
✓ Sawdust (only small amounts)
✓ Napkins and paper towels

Greens (Nitrogen)
Moist, Fresh, More Recently Alive

✓ Fresh green plant trimmings
✓ Green grass clippings
✓ Fruit & vegetable waste from your kitchen
✓ Coffee grounds & filters
✓ Tea bags
✓ Green garden waste
✓ Breads and pastas (no fatty sauces or spreads)
✓ Eggshells
✓ Manure of plant eaters
✓ Hair (human & animal)
✓ Vacuum wastes
✓ Spent hops
✓ Most weeds (nothing gone to seed)
✓ Hay
✓ Dead insects

Do Not Backyard Compost

✗ Plastic-coated paper
✗ Treated wood or sawdust
✗ Pesticides or poisons
✗ Used kitty litter
✗ Human waste
✗ Waste of omnivores or carnivores

✗ Grease, fat, oil
✗ Coal or charcoal ashes
✗ Particle board or plywood
✗ Meat & bones
✗ Dairy products
✗ Heavily colored paper
✗ Shredded office paper

✗ Chemically treated lawn clippings
✗ Diseased plants
✗ Weeds gone to seed
✗ Ground bones or bone meal
✗ Compostable tableware
✗ Compostable bags

Items written in green should be commercially composted instead

What you put in your compost is what you get out!
Where to Get Extra Composting Materials

Need more greens for your browns? Need to start or revive your bin?
Check with local vendors - many businesses give away great compostable material!

Greens (Nitrogen)

- Barbers: if concerned, try to make sure hair was not color-treated or permed
- Grocery Stores: usually stores will set aside bad produce and trimmings of sellable produce
- Pet Groomers: if concerned, find out if pet was sprayed with any flea-killing spray
- Juice Bars: Great place for pureed fruit, peels, and rinds
- Coffee shops: Call in morning, ask them to save the day’s coffee grounds for you
- Local farmers with chickens, rabbits, goats, cows: manure from herbivores is great to compost. Remember, you don’t want to use manure from any meat eater, including cats and dogs.
- Neighbors, friends: Ask them to save their produce scraps for you
- Breweries: Spent hops
- If not composting over the winter, can save your food scraps in the freezer

Browns (Carbon)

- Neighbors, friends: Ask them to save their leaves for you in the fall
- Leaf drop-off locations: Many cities have a leaf drop-off every fall, and composters frequently grab people as they enter these sites to get their bags of great, compostable leaves
- Yard waste collection sites: year-round yard waste drop-off centers. Please visit their websites for locations, hours, and more info.
  - Longmont
  - Superior
  - Boulder (Western Disposal)
  - Louisville
  - Nederland
  - Meeker Park/Allenspark
Soilsaver = #1 Recommended!!!

Features to Get
1. Solid wall construction
2. Locking lid
3. Fewer vent holes
4. Thick plastic build
5. Pieces held together by bolts, not plastic tabs
6. No bottom

Features to Avoid
1. Stacking pieces
2. Loose or no lid
3. Tumbling, turning bin
4. Large holes or vents
5. Anything not in direct contact with ground
6. Knock-offs of Soilsaver at Costco, etc.
7. Base plates (not required here)

Get your bin at today’s workshop! Bins are only $55, cash or check only. Or contact Boulder County’s Resource Conservation Division at 720-564-2220 or resourceconservation@bouldercounty.org
Currently $97.00 on www.amazon.com

Earth Machine or Compost Machine = Next best recommended because cheaper, similarly priced, and works, but doesn’t hold up well.

This is a marketing ploy → by having a bottom door, compost will simply come out as finish material! Don’t be fooled!
Tools

Must at least have a pitchfork!

Compost Aerators

*Good tool options after you have a garden pitchfork*

<table>
<thead>
<tr>
<th>Best Metal Aerator</th>
<th>Alternative Metal Aerator</th>
<th>Best Plastic Aerator</th>
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<tbody>
<tr>
<td>Called the Yard Butler Compost Turner:</td>
<td>Bosmere Compost Aerator:</td>
<td>(Melanie’s favorite!)</td>
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<tr>
<td>Amazon.com ($20.87)</td>
<td>Amazon.com ($27.17)</td>
<td>Exaco Plastic Composting Tool</td>
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<td>McGuckins ($29.99)</td>
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<td>Amazon.com ($22.35)</td>
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<td>Home Depot ($24.99)</td>
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Building A Backyard Compost Pile in Colorado

Step 1 - Materials

• Collect enough green and brown material to create a 1-cubic-yard (3’x3’) pile. If you don’t have enough materials for that, start with whatever materials you do have.

• Chop or shred the material to be 1-2” in size to increase surface area

Step 2 - Location

• Pick the location of your pile that is close to you and the hose. Don’t make it too difficult to reach or you’ll never go. Ideal is a level space, in shade, but a sunny spot also works. Choose a site close to where material will be used.

• Pile must be in direct contact with the ground (on dirt or grass), not over weedcloth or on any gravel, stone, etc.

Step 3 - Building a Compost Layer

• Start the pile with a 3-inch layer of greens (nitrogen) material such as food waste or fresh grass clippings.

• Add onto the green layer a 3-inch layer of browns (carbon-based) material such as dried leaves.

• Mix the layers together with a pitchfork. Use the garden hose to make this compost layer damp as a wrung-out sponge (do squeeze test to make sure it’s the correct dampness).

Step 4 - Repeat Step 3

• Repeat by building another mixed layer (Step 3) on top of the first layer, and then repeat again, and again, until you either run out of either greens or browns, or the bin/pile is full.

Step 5 - Cover

• Put a locking, tight fitting lid over the pile on top of your bin.

• If not using a bin, use a tarp or an old piece of carpet to cover the pile to reduce evaporation, especially critical in dry Colorado.

Caution

• Despite what the internet says, DO NOT add a layer of soil or other compost or manure to the mix as a nitrogen starter.

• Only add a small handful of soil to your compost mix if you are using a tumbler/turning bin (one that is NOT in direct contact with the ground) or if you have extremely poor soil conditions (such as after new construction).