

A User's Guide to **BACKYARD COMPOSTING**



Addison County
Solid Waste Management District

(802) 388-2333
AddisonCountyRecycles.org

What is compost?

In natural ecosystems, dead plants and animals decompose into the soil, where the nutrients are recycled into new life. **Composting is when humans manage natural biological decomposition.** Finished compost is stable, humus-like organic matter that contains a diverse population of microorganisms. Microbes and decomposed organic matter generate the structure and fertility of healthy soil, holding on to water and making nutrients available to plants.



Why compost?

Nearly a quarter of Vermonters' trash is organic material that could be composted!¹ Buried in landfills, decomposing organic matter releases methane, a greenhouse gas much more damaging than CO₂. That's one reason why Vermont passed the Universal Recycling Law (Act 148), which **bans all food scraps from the landfill** starting July 1, 2020. This mandate refers to all Vermont businesses, schools, offices, towns, events, and residents. The law passed unanimously in 2012 and has been implemented in phases since 2014.



By composting our organic waste, we reduce greenhouse gas emissions, recycle nutrients locally, and create a resource for growing healthy soil and food in our communities.

Home composting is an inexpensive and simple way to create a soil amendment for your lawn and garden while keeping your household in compliance with the law. **If composting at home is not for you, there are other options**, including:

- All Vermont **transfer stations** accept food scraps, including the ACSWMD Transfer Station.
- **Town trash & recycling drop-offs** accept food scraps, often for a fee. You can also ask your curbside **hauler** if they offer food scrap collection services.
- Ask a **neighbor** if they can compost your scraps or **feed them to chickens**. Gardeners love having extra compost!

Compost Ingredients

“Greens” and “browns” are the two types of ingredients in compost. Use **three times more browns than greens** to prevent odors.

Greens are rich in nitrogen:

- Fruit & veggie scraps
- Bread, grains, & pasta
- Eggshells & eggs
- Coffee grounds & filters
- Tea bags & loose tea
- Fresh grass clippings
- Fresh garden clippings

Browns are rich in carbon:

- Dry leaves
- Straw & hay
- Wood chips & shavings
- Small sticks & twigs
- Dry grass & garden clippings
- Shredded newspaper
- Paper towels & napkins
- Cardboard, paper egg cartons

What to keep out:

- **Meat, bones, fish & grease***
- Large amounts of dairy
- Weed seeds
- Diseased & invasive plants

- Dog or cat feces or litter
- Paper with glossy colors
- Pesticide-treated materials
- Cut flowers from a florist

***If you compost at home, you are allowed to throw meat, bones, fish, and grease in the trash**—those items break down slowly in small compost systems, which can cause odors and attract wildlife. You can also bring them to a drop-off location or use a Green Cone digester (see next page).



Tips for collecting food scraps

- Collect scraps in an easy-to-clean container with a lid.
- Chop food scraps into small pieces to speed up composting.
- Empty your pail every few days or keep it in the fridge or freezer to prevent odor or fruit flies.
- Remove PLU stickers before composting.

Compost Containers

Containers keep the pile tidy and make it easy to harvest the finished compost. Keep in mind that **decomposition is a natural process that will happen whether or not you use a container.** Here are several options for containers. Pick one that will best suit your needs!

Pit or Trench

Dig a hole or trench at least one foot deep; put food scraps in the hole in a layer of no more than four inches; cover with the original soil. Wait several months to a year before planting on top of the covered pit or trench.

Open Pile

Start with a layer of carbon-rich browns. Every time you add food scraps, cover with a generous amount of browns. Make sure no food scraps are visible from outside the pile. The pile should be dome-shaped to shed rain.

Wire Bin

Drive 3-4 stakes into the ground in a ring. Wrap chicken wire, hardware cloth, or other mesh fencing material around the stakes to make a ring. Starting with browns, begin layering materials.

Pallet Bin

Get four wood loading pallets (the ACSWMD Transfer Station often has free pallets). Wire three pallets together at the corners, leaving one side open. Line the bottom and sides of the bin with $\frac{1}{4}$ " or $\frac{1}{2}$ " hardware cloth (wire mesh). Line the fourth pallet with hardware cloth and attach with wire or hinges as a door. Optional: add pallets to create a 2- or 3-bin system. *More info: instructables.com/id/Pallet-Compost-Bin*

Trash Can

A great option for winter. Drill several holes in the sides and bottom to promote airflow. Starting with browns, begin layering materials. Cover with lid. Optional: roll on its side to mix. Once bin is full, let sit or empty into a pile to cure for several months before harvesting.

Tumbler

Tumblers work well as a fully enclosed first step in a compost system that finishes in a bin or pile. Start with a scoop of finished compost or soil to inoculate with microbes. Add food scraps and browns, turning occasionally to mix. When it's full, empty into a bin or pile, cover with browns, and let sit for several months before using.

Multi-Bin System

Use untreated lumber to make a 2- or 3-bin system. Line the interior and bottom with hardware cloth to keep pests out. Use boards as a removable front wall. Add a hardware cloth-lined lid. Always add fresh material to the first bin. As each bin fills, move the contents into the next bin to aerate and mix the materials. *Plans available at: cvswwmd.org/home-composting*

Green Cone Solar Digester

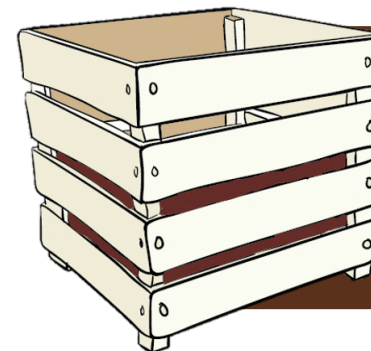
Green Cones digest materials including meat and bones underground and fertilize the soil nearby (they don't make compost). Green Cones need well-drained soil and full sun for at least half the day. They are totally enclosed systems. They should be moved every few years but otherwise do not require management. Green Cones are sold at cost at the ACSWMD Transfer Station. *More info: addison-countyrecycles.org/food-scraps/composting/green-cone*

Store-Bought Bin

There are many styles of manufactured bins available for sale. The ACSWMD Transfer Station sells SoilSaver brand compost bins at cost. Simply assemble the bin, and starting with browns, begin layering materials.

Choosing a location

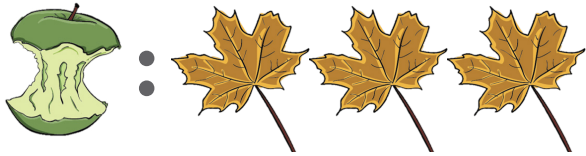
Locate your compost pile in a well-drained area that is **easily accessible**. Consider whether you will need access to the compost during the winter or if you will bring food scraps to a drop-off location during snowy months.



Managing Your Compost Pile

1 Part Green : 3 Parts Brown

For every container of food scraps, add three containers of browns. This ratio gives the microbes a balanced diet of carbon and nitrogen to break down the food scraps without odors. Using plenty of browns makes it more pleasant for you, speeds up the compost process, and deters wildlife.



Building the pile

1. If you're using a bin that is open on the bottom, consider laying **hardware cloth** ($\frac{1}{4}$ " to $\frac{1}{2}$ " wire mesh) underneath to keep critters from burrowing up into the pile. Secure with soil around the base.
2. Next, add a **layer of browns** to absorb moisture and allow air into the bottom of the pile. Coarse materials such as wood chips or criss-crossed dry plant stalks or sticks work well for this layer.
3. Now you're ready to **add greens**—food scraps and other fresh, moist materials. Mix or layer in plenty of browns.
4. Every time you add greens, finish by **covering with a layer of browns** to filter odors and deter flies and wildlife. Make sure no food scraps are visible from the outside of the pile.

Tips for collecting browns

- Collect browns in the fall when they are abundant.
- Shred leaves with a bagging lawn mower or trimmer to prevent them from compacting in the pile.
- Keep browns dry in a trash can with a lid or covered with a tarp.
- Store browns right next to the compost pile for easy access.

Let it breathe

Just like you, the microbes in your compost need **food, water, and air**. The pile should be as moist as a wrung-out sponge. Any wetter and odor-causing microbes will take over—which stinks!

Adding **plenty of browns of various sizes** creates air space, as does turning or mixing the pile. You can occasionally **turn the pile** by moving it into an empty bin, rotating it in a tumbler, or stirring it with a pitchfork or aerator tool. While optional, turning speeds up decomposition.

Winter Composting

- Think of tromping through the snow to your pile as fresh air & winter exercise!
- Scraps will pile up when they freeze. Start winter with an extra or empty bin to accommodate the volume. The pile will shrink significantly come spring.
- **Keep adding browns!**
- Or, you can take a break from composting at home and bring your scraps to a drop-off location.

Compost is alive!

When you compost, you're really **farming microbes!** Bacteria, fungi, and actinomycetes do most of the decomposition. The larger decomposers include mites, millipedes, centipedes, springtails, spiders, slugs, beetles, ants, nematodes, flatworms, rotifers, and earthworms. Diversity is your friend!

Hot or cold?

Commercial compost piles reach high temperatures that decompose materials quickly and destroy pathogens and seeds. Most home compost piles are too small to generate much heat and take several months to finish. Seeds and pathogens aren't guaranteed to die in a "cold" compost, so keep meat, weeds, and diseased plants out of the mix.

For hot composting, you need at least one cubic yard of material and the right carbon-to-nitrogen ratio. For more info, check out Resources on the back cover.

Troubleshooting

Many common composting challenges have simple solutions.

If your compost stinks...

Make sure you're not adding any meat, bones, fish, shellfish, fats, grease, or large amounts of dairy to the pile. Turn or mix the pile to aerate it. Break up any compacted or especially wet areas. Mix in browns such as dry leaves, straw, or wood shavings. Finish by covering the pile with several inches of browns to act as an odor filter. Even if you can't turn the pile, covering with browns will filter odors significantly. Going forward, be sure to add three times the amount of browns as greens every time. A well-managed compost pile should smell earthy, not stinky!



If your compost is attracting flies...

Flies are not bad for compost, they are just unpleasant for you. Cover exposed food scraps with browns such as dry leaves or wood shavings, or bury fresh scraps deeper in the pile. In the kitchen, cover scraps with sawdust or wood shavings, or keep the container in the fridge or freezer to prevent fruit flies.

If your compost attracts animals...

Make sure you're following all the steps listed to the left to reduce odors. To keep small animals out, line your compost system with ¼" hardware cloth or start materials in a tumbler. Regularly turn your pile so it composts more quickly.

To deter bears, take down bird feeders between March and December and secure your trash (make sure neighbors do, too). In addition to keeping out meat and bones, do not add sweet-smelling fruit (such as cantaloupe rinds) between March and July. Bury these items or take them to a drop-off location. Leave an ammonia-soaked rag in a bucket next to your pile. Replace every 2-3 weeks.

If a bear enters your yard, make noise! Yell or bang pots and pans so it has an unpleasant experience, making it unlikely to return. You can stop composting at home until the bear leaves the area (bring scraps to a drop-off location). Or, surround your bin with an electric fence (bait the fence with peanut butter). Contact VT Fish and Wildlife for advice before a bear becomes a problem.

More info: vtfishandwildlife.com/learn-more/living-with-wildlife/living-with-black-bears

Harvesting & Using Compost

When is it ready?

It takes several months to a year for a cold compost pile to finish. Take finished compost from the bottom of the pile if you don't want to wait for the whole pile to finish composting. When compost is ready, it smells earthy and looks like dark mulch or soil—or crumbly chocolate cake! You may still see broken egg shells, small sticks, or other chunks.

Optional: Screen it!

If you don't mind the occasional egg shell or avocado pit, use the compost as is. If you prefer a less chunky product, screen it. Use a mesh nursery tray or make a screen by stapling ½" hardware cloth to a lumber frame. Sift compost over a bucket or wheelbarrow, and return large intact materials to your compost pile.

How to use compost

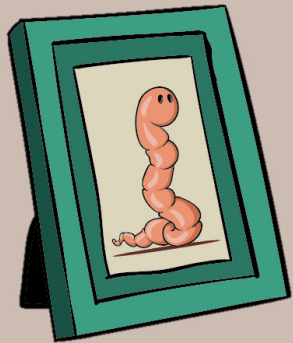
- **Lawn:** Compost will reduce watering needs and help prevent erosion. Apply a layer up to ¼" deep. Water thoroughly.
- **Garden beds:** Add compost every year before planting. Apply 2-4" (more for deficient soils) as a top dressing or turn into the soil. Apply a top dressing again in the fall.
- **Planting:** Mix 1 part compost with 2 parts soil to use as potting mix.
- **Established trees & shrubs:** Top dress a 1-2" layer of compost a few inches from the base of the plant in the spring or early summer.
- **Potted plants:** Add compost to soil when you repot your plants (no more than 1 part compost to 2 parts soil). Or top dress with a ¼" layer of compost and scratch into the potted soil.
- **Starter mixes:** Create your own seed starter mix using: 1 part mature sifted compost; 2 parts soil; 1 part sand, perlite, or vermiculite.
- **When mulching:** Put compost around plants before adding mulch.

Composting with Worms

Vermicomposting, also known as worm composting, is the digestion of food scraps by worms. It's odorless, easy, and fascinating! Worm composting can be done indoors year-round. Worms won't eat all food scraps, so they should complement another option such as an outdoor pile, Green Cone, or drop-off location.

Red wiggler worms are efficient at breaking down food scraps and generating "castings" (worm poop) that are an excellent soil amendment for house plants and gardens.

Specially made worm bins are available for purchase, but the worms will be just as happy in a bin you make yourself.



Making a worm bin

Materials:

- One or two plastic containers with a lid—minimum of one cubic foot. Opaque storage tubs work well.
- Drill with approximately 1/4" bit
- Newspaper, clean cardboard, used paper towels (chemical-free), or fiber egg cartons for bedding
- Fine screen or mesh (optional)
- Tray or pan that fits underneath the container (optional)

Instructions:

1. Drill several holes in the bottom, sides, and lid of the bin(s) for drainage and air circulation. If you are using two containers, you can leave the bottom of one container intact and use it as the bottom bin.
2. Optional: Cut a piece of screen or mesh to cover the holes you drilled to keep the worms from falling out and as a barrier to insects.
3. If using two bins, place one inside the other with the bin without holes in the bottom underneath.
4. If using one bin, place the tray underneath to catch liquid.

Use the right worms

Red wigglers (*Eisenia fetida*) are the best species for worm composting because they thrive between 55 and 75°F in environments with lots of organic matter. Common garden worms will not survive in a worm bin. Get worms from someone in your community, a bait shop, or an online supplier. Ensure the species you are getting is *Eisenia fetida*. Red wigglers eat up to their body weight every day, so start with about a pound.

Managing the worm bin

Shred enough newspaper or other paper to cover the bottom of each bin with about two inches of bedding. Moisten the newspaper so that it is about as moist as a wrung-out sponge. Add worms on top of the bedding.

Feed worms about once a week, and wait to add more food until they have finished their last meal. Start with an amount of food about equal to the amount of worms you have. Pay attention to how much your worms eat, and adjust the amount you feed them accordingly. Bury fresh food scraps in the bedding already in the bin, or add the food scraps on top and cover with fresh, moist bedding.

Menu

Feed your worms mostly scraps from fruit and vegetables. You can also add coffee grounds and filters, paper tea bags and tea leaves, plain pasta and rice, and crushed egg shells in modest amounts. Bread, citrus, and pineapple can be added in minimal amounts.

Do not feed worms meat or dairy products, onions, garlic, leeks, hot peppers, oils, butter, vinegar, or spicy, salty, or pickled foods. Avoid feeding worms cruciferous veggies (like broccoli) if you notice an odor.

Using the castings

There are multiple ways to separate the castings from the worms. Use the castings in the same ways you would use compost, making sure not to use more than 1 part castings to 3 parts soil.

Drain any liquid that accumulates in or under the bin and dilute it to make a "worm tea" for watering plants.

For details and troubleshooting, visit addisoncountyrecycles.org/food-scraps/composting/vermicomposting



Resources



Community-Scale Composting Systems. McSweeney, James. White River Junction, VT: Chelsea Green Publishing, 2019.

Find food waste reduction strategies at savethefood.com

Become a Vermont Master Composter. Learn more at uvm.edu/extension/mastergardener/vermont-master-composter-course

Visit www.AddisonCountyRecycles.org for food waste reduction tips, compost workshops, food scrap drop-off locations, vermicomposting info, and more.

The ACSWMD Transfer Station sells SoilSaver Compost Bins, Green Cone Solar Digesters, and SureClose Kitchen Collectors at cost. Free 5-gallon food scrap buckets are available for bringing food scraps to a drop-off location.

References

The Dirt on Compost. Cassandra Hemenway, Central Vermont Solid Waste Management District and Vermont Master Composter, 2019.

NYC Master Composter Manual. NYC Compost Project, nyc.gov/compostproject.

The Vermont Master Composter Resource Manual. State of Vermont Agency of Natural Resources, 2017.

Images: Hannah Rand, www.hannaharand.com



Addison County Solid Waste Management District
1223 Route 7 South, Middlebury, VT 05753
(802) 388-2333 · AddisonCountyRecycles.org

