

DIGGING IN:

A BACKYARD COMPOSTING GUIDE



LETTING THINGS GO BAD...PRODUCTIVELY

Composting isn't just about tossing banana peels into a bin—it's a quiet revolution happening right in your backyard. With every eggshell, coffee ground, and wilted lettuce leaf, you're joining a cycle that nourishes the earth, reduces waste, and builds something truly regenerative from what we usually throw away. We've designed this book to help those who are wanting to start their composting journey or for those who have experience but want to improve the performance of their compost pile.



Consider it your no-nonsense, dirt-under-the-fingernails guide to composting: what it is, why it matters, and how you can start today, no matter where you live. It is Recycling Connections' goal to help you find enjoyment in composting and to reap the benefits it has to offer. Get ready to turn your food scraps into soil amendment and make a lasting impact.

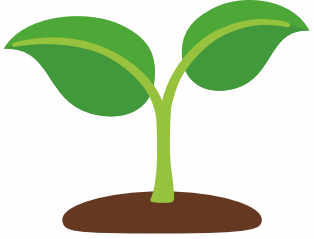
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WHAT IS COMPOSTING?

Composting is simply managing nature's decomposition cycle.



Let's take plants as an example:

Plants take up nutrients from the soil and absorb sunlight to help the plant to grow.



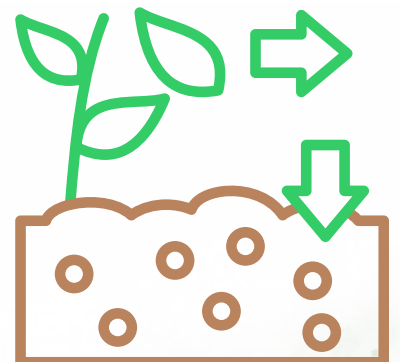
Those leaves are then eaten by other organisms or decomposed after the plant dies.



During decomposition, nutrients from the leaves are converted by the millions and billions of microorganisms, fungi, and other decomposers releasing nutrients and energy back into the soil allowing plants to grow again.

This is the natural decomposition cycle of growth, decay, and re-growth.

With better understanding of this cycle, we can better manage our own compost by mimicing and speeding up the natural decomposition process in our own yards.



WHY SHOULD WE COMPOST?

Think of composting like recycling; we're helping nature "recycle" valuable nutrients back into the soil. In turn, we reap the benefits of that nutrient-rich soil amendment.

In the 2020-21 Wisconsin Waste Characterization Study conducted by the WI Department of Natural Resources, organic material such as food scraps and wasted food make up 30.4% of our solid waste going to landfills in the state. That's one-third of what we send to landfills that could be diverted. By composting, we divert the organic material from the landfill which also saves space for other material and reduces potent greenhouse gas emissions that contribute to climate change. Composting yard and food scraps at home is one of the easiest and cheapest ways of taking responsibility for your own waste and being good stewards.



PROBLEMS AT THE LANDFILL

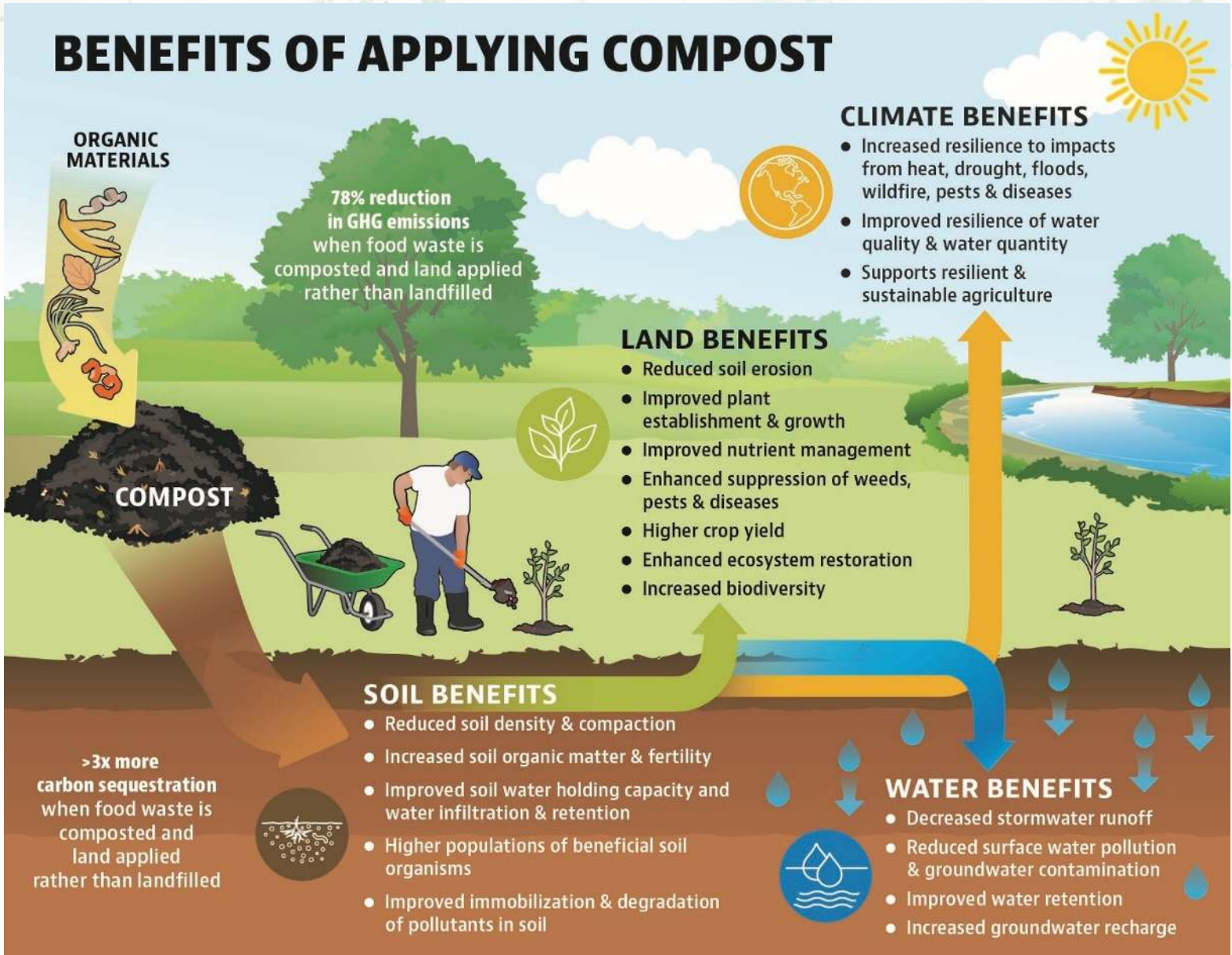


Waste at landfills is compacted and sealed, creating an environment lacking oxygen. Within these closed environments, organic material decomposes very slowly by microorganisms, called “anaerobic microbes,” that do not require oxygen to live and grow. When these anaerobic microbes breakdown organic material, they release methane gas, a greenhouse gas more than 20 times more potent than carbon dioxide. If this gas is not captured in the landfill system, then it is released into our atmosphere contributing to climate change.

When food waste and organic materials are composted, materials are broken down in a way that is actually healthy for the environment and reduces climate impacts. Material in an oxygen-rich environment quickly decomposes, turning it into nutrient-rich, soil amendment.

BENEFITS OF COMPOSTING

BENEFITS OF APPLYING COMPOST

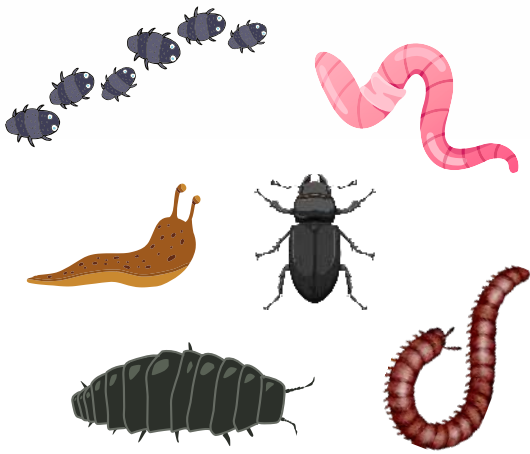


Source: www.epa.gov/sustainable-management-food/benefits-using-compost

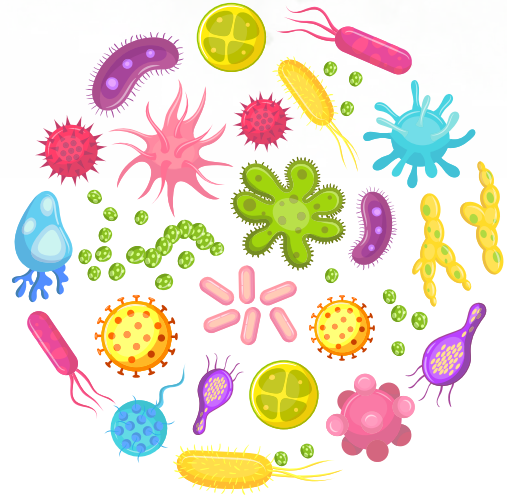
Graphic from United States Environmental Protection Agency (EPA). This infographic demonstrates the benefits composting has on soil, land, water, and climate.

HOW DOES COMPOST HAPPEN?

Decomposition of organic material is aided by the help of beneficial macroscopic and microscopic organisms.



Macroscopic organisms are organisms that are visible to the naked eye; think worms, insects, millipedes. These organisms physically break down large pieces of organic material into smaller pieces, aiding in aeration and creating pockets of oxygen to help other organisms thrive.



Microscopic organisms require a microscope to see. Did you know? A teaspoon of healthy soil can contain between 100 million and 1 billion bacteria, according to Ward Laboratories. These tiny organisms are the true work horses in decomposition. They break down the organic material chemically, releasing nutrients into a form that plants can absorb easily, creating the nutrient-rich compost we're looking for.

The interaction between macroscopic and microscopic organisms is essential for a successful composting process. Encourage this interaction by creating favorable conditions to keep these organisms happy and working for you.

FAVORABLE CONDITIONS

The key requirements to help micro and macroorganisms thrive is the same things needed by all living things: Air, water, food, and shelter.

Let's take a deeper look into these.

AIR

The macro and microorganisms that we want to favor in our compost piles love oxygen. They are called aerobic organisms, or oxygen-loving organisms. When these organisms break organic material down, they give off a pleasant, earthy smell similar to that of a forest after a good rain. Therefore, incorporate air pockets in your compost pile by occasionally “turning it” and adding some bulky material like leaves and twigs to help create air channels and pockets throughout the pile. The air channels help the microbes work more efficiently and speed up the decomposition process.



For more information on
adding air to your
compost pile, see:
[Turning Your Pile](#) on
page 24.

WATER

All living organisms need water to live; this includes tiny microscopic organisms in your compost pile. When the compost is too dry, microbes will move deeper into the earth, leaving your pile, where they can access water. This slows decomposition in your compost until the moisture conditions become more favorable to the microbes. On the other hand, if the compost pile is too wet, water will fill the air spaces and hinder the microbial activity by preventing the flow of oxygen. The optimum moisture levels are anywhere from 45% to 60%; moisture levels above 65% develop anaerobic conditions which will lead to those unpleasant smells and the compost feels soggy.



Squeeze Test: A good frame of reference for an ideal moisture level for compost is about as damp as a wrung-out sponge. If you pick up a handful of your compost and squeeze, only a few drops of water should be released. The material should stay in a clump for a few seconds after opening up your hand.

- *Too Dry:* If you pick up a handful of your compost and it crumbles to pieces, it is too dry. Add water or hose your compost down.
- *Too Wet:* If it is too wet, add some dry material such as leaves, straw, or hay or leave the lid off on a sunny day.

FOOD

So, what do you “feed” your compost? Think of your compost as a living organism – because it is! The aerobic microbes need food to survive, just as all living things do. A good balance of carbon-rich, organic material and nitrogen-rich, organic material creates the perfect recipe for microbes to thrive. In the composting world, these materials are often referred to as **Browns** and **Greens**.



Carbon-rich materials are often brown or tan in color. Examples are dead, dry leaves, woodchips, straw, hay, and twigs. The **Browns** help microbes **produce energy to break down material**.



Nitrogen-rich materials are “**green material**” or more fresh and colorful. Examples are food scraps, grass clippings, plant scraps. The **Greens** help microbes with **growth and reproduction**.

A balanced ratio of carbon and nitrogen ensures efficient decomposition. As a general rule, ratios of nitrogen and carbon is 1:1 by weight. That is half **Brown** material and half **Green** material by weight. Go to page 15 for more information on carbon and nitrogen materials.

HOME

All organisms need a home or shelter. For microbes to thrive, you must keep them in an environment that maintains conditions as favorable as possible. Compost will happen in an open pile, but creating a bin or container will provide the conditions that will be most suitable for them to work more efficiently for you in breaking down material quickly. Here are some examples of compost bins.

Do It Yourself



Creating a bin or bin system using materials you already have is a great way to create a system that is cost effective. We recommend a 2-3 bin system for the more active composter. There are many plans on the internet for building cost effective compost systems that work well.

Home Composter



Tested and true, our most recommended home compost bin is the Home Composter. But, any compost bin that has the capacity of holding 4-5 garbage bags of yard material with an open bottom will do well.

Tumblers



Although we don't suggest tumbler systems since they are detached from the free flowing movement of earth-living microbes, these are liked by some homeowners, particularly those with small yards. They are, typically, more expensive.

GETTING STARTED

EQUIPMENT - WHAT DO YOU NEED?

- Compost bin (DIY or Purchased Bin)
- Pitchfork or garden fork
- Kitchen pail
- Thermometer (optional)

MATERIALS REQUIRED

- **Brown Stuff**: carbon rich material such as dried leaves, broken twigs, or wood chips
- **Green Stuff**: nitrogen rich material such as grass clippings or vegetable kitchen scraps
- **Access to a Hose** (optional): to keep moisture levels at ideal conditions, it is nice to have a hose to water the compost pile in during warm, dry months.

SAFETY FIRST!

- Garden Gloves are recommended
- A bandana or face mask should be used when turning the compost. Fungal spores or other plant material get airborne and can cause irritations if breathed in.

LOCATION



The location of your bin placement should be centered around convenience. Consider placing your bin a reasonable distance from your house, but not too great of a distance to where accessing it is difficult. We want our bin placed directly on the ground (as opposed to concrete or other hard surfaces) to promote good contact with microorganisms. Ideally, find a dry location that is easily accessible to a water source. Good drainage is important to avoid a soggy, unpleasant smelling compost. Additionally, avoid areas that may be exposed to high winds that could damage your bin or cause your compost pile to dry out. The bin can be in a sunny location or a shady location, but keep in mind the sun will cause the compost to dry out faster. If it is in shade, it may take longer to dry out if conditions get very wet.

GATHERING MATERIALS



Gathering and storing carbon-rich materials, like leaves, is easy. Save your raked leaves and store in extra garbage bins or bags until needed, or ask a local farmer or store that sells straw or wood chips. These types of materials are easy to store and won't break down quickly.

You will also want to gather nitrogen-rich materials like grass clippings or vegetable food scraps. These materials break down quickly and release stinky smells and gases if not blended with brown material right away. When starting your compost, be sure to have enough brown material ready to mix with your green material. Add a layer of brown every time you add greens to your pile.



COLLECTING KITCHEN SCRAPS



Keeping a container available in the kitchen for food scraps makes kitchen composting even easier! Any sort of container or bucket with a lid works. Kitchen scraps can stay in the container for a few days before being brought out to your compost bin which saves you a trip to the compost bin each and every time you have an eggshell or peelings from dinner.

At Recycling Connections, we prefer our Kitchen Katcher Pail! These pails are stainless steel with a 1.25-gallon capacity and are dishwasher safe. The decorative design keeps them looking sleek on the counter, but they're also small enough to fit into a cupboard or under the sink.

If you're interested in purchasing one, visit our website at:

www.recyclingconnections.org/shop

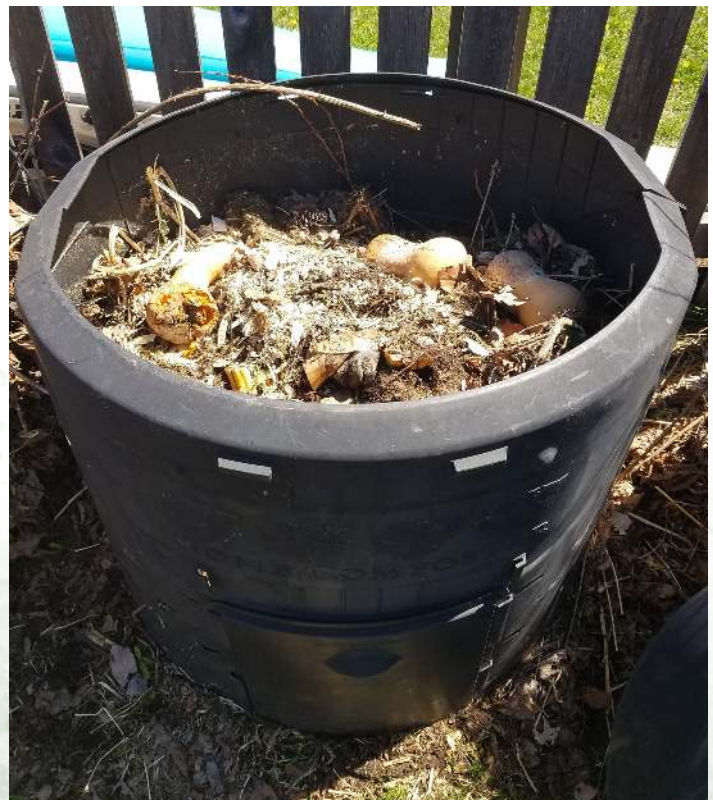


SETTING UP

After assembling your bin, add the brown material first. It is helpful to dampen it to start. Then, add green material. Top with an equal amount of brown material **by weight** over the green material. The microbes need both carbon and nitrogen to do their magic.



Repeat this layering process every time you add to your bin. Always cap off your bin with carbon-rich, brown material to help deter pests and odors.



GOLDEN GREEN & BROWN

RATIOS

Scientists have experimented with carbon and nitrogen (C:N) ratios to find which is best for a fast working, “hot” compost pile. Within these experiments, scientists found a C:N ratio of 30:1, by volume, creates the ideal conditions for microbial decomposition which allows the compost pile to quickly break down.

While there are formulas to calculate the perfect ratio, a helpful general rule is to use **equal parts green** (nitrogen-rich) **and brown** (carbon-rich) **materials by weight**. Green materials—like food scraps and grass clippings—tend to be heavier than brown materials, such as dried leaves or wood chips. Because of this, you may need two to three times more brown materials by volume to balance out the weight of the green materials.

If you're not in a hurry to produce finished compost, the exact ratio is less important. Instead, you can adjust the amount of green and brown material based on what you have available. For example, compost piles with a lot of brown materials like wood chips will still break down, but the process will be slower — taking anywhere from six months to a year.

CARBON SOURCES (BROWN MATERIAL)	NITROGEN SOURCES (GREEN MATERIAL)
Hay	Vegetable Scraps
Dry Leaves	Grass Clippings
Paper	Fruit Scraps
Sawdust	Seedless Weeds
Paper	Dead Plants

“HOT” COMPOSTING



“Hot” composting is a method that maximizes microbial activity to speed up the composting process. As microbes break down organic material, they generate heat as a natural byproduct. When conditions are favorable - such as the right moisture level, oxygen, and nutrient balance - microbes become more

active, reproduce faster, and increase the internal temperature of the compost pile. In general, higher temperatures lead to more rapid microbial decomposition. The faster this process occurs, the sooner the compost is finished and ready to use.

Hot composting can produce finished compost in as little as 4 to 6 weeks, much faster than traditional methods. However, to maintain the high level of microbial activity, the pile needs to be turned every few days. Turning introduces oxygen, which is essential for aerobic microbes, and helps regulate temperature by mixing the materials. This also prevents certain areas from becoming too hot, which can damage the beneficial microbes responsible for decomposition.

“HOT” COMPOSTING PROCESS

STAGE	TEMPERATURE RANGE	STAGE DURATION	WHAT HAPPENS	KEY ACTIVITIES
1. Preparation & Pile Building	Ambient (~50–77°F / 10–25°C)	Initial setup	Materials are mixed to achieve ~30:1 C:N ratio	Chop/shred materials, moisten pile, ensure airflow
2. Mesophilic Phase	68–104°F (20–40°C)	1–2 days	Moderate-temp microbes begin breaking down simple organics	Heat begins to build from microbial activity
3. Thermophilic Phase	104–160°F (40–71°C)	Several days–1 week	Thermophilic microbes decompose proteins, fats, and complex materials	Turn pile every few days to add oxygen and distribute heat

OPTIMAL RANGE	130–150°F (54–66°C)	High temps kill pathogens and weed seeds	Avoid exceeding 160°F to protect beneficial microbes
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4. Cooling Phase	104–68°F (40–20°C)	1–3 weeks	Easily digestible materials are gone; temperature drops as activity slows	May turn pile occasionally. Mesophilic microbes return
5. Curing Phase	Ambient (~50–77°F / 10–25°C)	4–8+ weeks	Remaining material stabilizes and matures into finished compost	Do not skip. Curing prevents plant harm from immature compost

Curing is the crucial last step of composting. It allows the compost to stabilize, which reduces the risk of harmful substances, like phytotoxins and ammonia, reaching plants and causing damage. Finished, cured compost is dark, crumbly, and smells like fresh soil.

MATERIALS TO AVOID

MATERIALS TO AVOID

Non-food items, aluminum, plastic, stickers, twist ties, etc.

Meat & Bones

Fats & Oils

Dairy Products

Pesticides & Poisons

Cat & Dog Feces

Diseased Plants

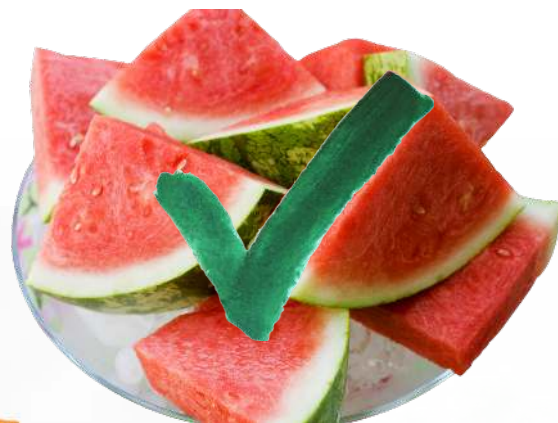
Weeds that have gone to seed

Many materials should be kept out of the compost bin. Non-food items like metal or plastic won't break down and should be recycled or disposed of according to your local solid waste guidelines. Dairy products, meat, and bones can attract pests, so it's best to avoid putting them in your backyard compost bin. Items like pet waste, yard trimmings, or plants treated with pesticides may contain harmful chemicals that could affect both plants and humans. Instead, focus on composting fruit and vegetable scraps, grass clippings, wood chips, and leaves.



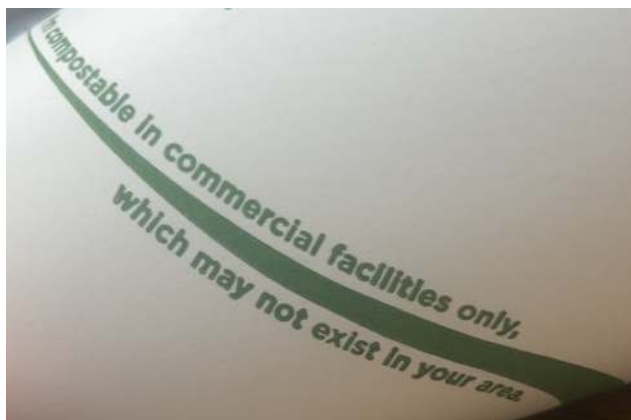
SIZE OF MATERIALS

Keep in mind that the size of the pieces of the material placed into the compost bin will affect the speed of the decomposition. Our microbial friends work from the outside in, so smaller pieces with more surface area will be broken down faster. Throwing a large log into your bin will take considerably more time to break down than if it was cut apart. A whole potato will take more time than a chopped potato to decompose. It doesn't have to look pretty – it just has to be small!



“COMPOSTABLE” FOOD PACKAGING

There are many options for single-use plastic and paper items that are labeled as compostable: plates, bowls, silverware, cups, etc. There are misinterpretations of the true composability of these items. These items often consist of a combination of materials like bioplastics, films, or coated paper, and some of these components can be more challenging to compost than others. The standards for items to be “compostable” are based on lab tests, not necessarily tested in the small scale backyard composter.



Commercial composting facilities are designed to optimize conditions for rapid and complete breakdown, but there’s no way to tell how long it actually takes for these products to break down and decompose completely in a backyard compost bin.

So, while these items may be compostable at commercial composting facilities, the conditions for backyard compost vary and won’t generate the high temperatures and controlled conditions needed for full decomposition of this type of food packaging. Avoid putting single use compostable service ware in your home compost bin.

MAINTENANCE: TURNING YOUR PILE



Turning your compost pile helps produce high-quality compost more efficiently. It ensures that every part of the pile gets a balanced amount of air, water, and nutrients. Turning the pile brings in fresh oxygen and creates air pockets, which are crucial for microbes to break down the organic matter. By mixing the materials, the decomposition process speeds up. Move materials that are less

decomposed from the outer edges into the center where they can benefit from heat and microbial activity. This also helps distribute moisture and heat evenly, preventing overly dry or soggy spots.

MAINTENANCE: TURNING YOUR PILE

Like many aspects of backyard composting, the frequency of turning the pile depends on personal preference. The materials will break down without intervention from us, but actively managing the pile can speed up the process. For those who prefer a less hands-on approach, visual and odor cues can indicate when it's time to turn the pile. A compost pile with a strong, unpleasant odor instead of a fresh, earthy smell is one that isn't breaking down properly should be turned.



If you prefer a more active composting routine, start by turning the pile weekly while it's building and heating up. Once the pile is well-established and at peak activity, you should turn it more frequently, perhaps every 2-3 days, to ensure proper aeration.

HARVESTING YOUR COMPOST

As your compost bin begins decomposing, the volume will shrink. It is normal for the volume to shrink 75% - 80%. The layering process of adding nitrogen sources and carbon sources can continue until the pile stops shrinking and there's no more room for material.



Once the pile gets large, turning and mixing your compost pile can get challenging. At that point, it's time to turn the pile completely and harvest your finished compost.

HARVESTING YOUR COMPOST



The easiest way to do this is to disassemble the bin and remove it from the pile. The contents will hold shape because of the moisture level.



Compost is finished when there are no longer any recognizable pieces of material; finished compost should look similar to dark, crumbling topsoil and have an earthy smell.



Place your assembled bin next to the pile and begin the layering process again, adding nitrogen and carbon material as needed. As you sift through, throw any big pieces back into the bin to finish composting. Use the squeeze test to check moisture level – remember your compost should feel like a wrung-out sponge, not crumbling apart in your hand or releasing so much water it runs down your hand.

WHAT TO DO WITH FINISHED COMPOST?

Using compost reduces the need for artificial, chemical-based fertilizers. Those types of fertilizers can throw off the natural cycle of decomposition and living things out of balance. Plus, compost from your backyard is free! Here are some tips to put that compost to work:

VEGETABLE GARDENS

Compost is a great soil amendment. A few weeks before planting your vegetable garden, spread a 1 to 3 inch layer of finished compost over the surface of your garden and work it into the soil at a 3-to-6-inch depth.

POTTED PLANTS

Add an inch of compost to your potted plants and work into the soil to provide them with a nutritious meal.

MULCH

Spread compost around trees or shrubs and work into the soil at a depth of about 2 inches. Compost can be used the same way you would use peat moss, manure, or other mulch.

FLOWERBEDS

Similar to a vegetable garden, prepare your flower bed with a 1-to-2-inch layer of compost and work into the soil.

LAWNS

Compost can be sprinkled on top of established lawns. You can screen your compost before placing it into a lawn spreader. More than a quarter inch of compost can smother your lawn so it is important to keep it to a very thin layer.

Note: Make sure your compost no longer has any recognizable materials and is a stable temperature before adding it to your garden, flower beds, lawn, or potted plants. Too much carbon will cause the microbes to look for sources of nitrogen to process material and will compete with plants.

PREPARING COMPOST FOR WINTER

Think of composting in the winter like composting in the summer, but in slow motion. As the colder months approach, the food scraps in your bin will freeze. While there is still decomposition happening, it's happening at a much slower rate. We want to ensure our bin will have adequate space to continue to hold food scraps even throughout the colder months when decomposition has slowed.

First, we'll want to disassemble our bin and remove it from the pile. Turn the pile to incorporate any materials that have yet to decompose. Reconstruct your bin next to your pile or select a new location – ensuring it's accessible, particularly if you live in an



area that's expected to have a large amount of snow accumulation (reference page 14 for more information on how to choose a location for your compost bin). Consider placing your bin in a sunnier location to help with decomposition process during these colder months. Once placed and reassembled, you are ready to begin placing green material in your bin and starting the process over again with ample space to get through those winter months.



FAQS & TROUBLE SHOOTING

WILL THE COMPOST BIN SMELL BAD?

Your compost bin shouldn't smell bad – a pile that is properly tended won't create unpleasant odors. It should have an earthy smell, sort of like a forest.

TROUBLE SHOOTING

Rotten Egg Smell: Pile needs more air or it's too wet. Turn the pile and add browns to soak up excess moisture.

Ammonia Smell: Too much green material. Restore balance by adding browns.

WILL THE COMPOST BIN ATTRACT ANIMALS?

TROUBLE SHOOTING

Attracting Flies: Bury food scraps three inches below surface.

Attracting Animals: Bury food scraps and consider adding a critter guard.

If your compost bin is attracting animals or flies, try burying your green material or cease adding it for a bit. There are also barriers for animals that can be added to your bin if the problem persists.

FAQS & TROUBLE SHOOTING

NOTHING IS HAPPENING

There are a few reasons this could be happening. Your pile might be too small, too wet, or too dry. Don't get discouraged! There are many troubleshooting options.

TROUBLE SHOOTING

Too Small: Add material until at least 3 feet deep

Too Wet: Turn pile and add brown material

Too Dry: Turn pile and add water

WHEN WILL MY COMPOST BE READY?

Finished compost can be ready in as early as 6 weeks depending on how active you are. Aiming for a good balance of carbon and nitrogen material and turning your pile frequently will help speed up the decomposition process.

If you are not in a rush or you don't feel compelled to use the finished product, then don't stress it. Just enjoy keeping food waste from the landfill and helping Mother Earth!

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ADDITIONAL RESOURCES

Institute for Local Self Reliance (ILSR) has a focus area of Community Composting. They list excellent resources for the home composter at ilsr.org/composting/home-composting.

Recycling Connections. For over 30 years, Recycling Connections has provided education and outreach in home composting. Visit www.RecyclingConnections.org/composting.

University of Wisconsin Extension. They offer a free course titled “Compost and Soil for Master Gardeners.” Visit <https://blogs.extension.wisc.edu/compostandsoils>.

Wisconsin Department of Natural Resources This page offers state focused resources on composting. Visit dnr.wisconsin.gov/topic/Recycling/Compost.html.

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