

Compost Ingredients: Lists, Ratios, & Cautions For Beginners

By Sydney Bosque



Anything that was once living can decompose and provide nutrition for soil. Dead leaves, grass, twigs, insects, and animals will all break down into basic elements that fertilize plants.

However, **meats, cooked vegetables, bread, and similar organic materials are *not* recommended for home compost piles. Not because they can't decompose, but because they attract animals that disrupt the composting process.**

Also, cooked foods and meats can introduce food-borne diseases that may transfer to vegetables if the compost is used in a vegetable garden (this is how leafy greens become contaminated with E. coli).

Therefore, compost piles are limited to *plant material*. A successful active compost pile will have a 2 to 1 carbon-to-nitrogen ratio by volume. So, in general, you should have 4" layers of brown material alternating with 2" layers of green material ([source](#)).

There are **two ways to build a compost pile**:

1. **Collect all of your ingredients and build a pile at one time.** This is easier for gardeners with ample ingredients who create multiple piles, and who want to have usable compost within a few months.
2. **Put down a layer of brown material and add ingredients as you have them.** This is easier for gardeners with limited access to ingredients. Compost won't mature until a few months after the last addition of organic material, so keep this in mind as you plan your compost piles.

It is easier to maintain an active compost pile if you choose to collect all of your ingredients and build a pile at once. However, this isn't possible for gardeners with limited access to ingredients. If you are adding to your compost pile gradually, it will fluctuate between active and passive composting.

Nitrogen



Materials that fall into the nitrogen category are still higher in carbon than nitrogen. However, they have much more nitrogen than brown materials like dead twigs and cardboard.

Nitrogen materials are harder to store up than carbon materials. Grass clippings, vegetable peels, and rotten tomatoes begin to shrink and stink if you store them for too long. If you want to build your compost pile at one time, ask neighbors for yard waste and kitchen scraps, and talk to local restaurants about picking up vegetable peels or old produce.

If you are building your pile gradually, make sure you add nitrogen in the correct ratio to carbon. Most kitchen and yard waste is green, so piles that are built over time can become nitrogen-heavy. Throw in a few handfuls of shredded paper or cardboard to keep your pile balanced.

Choosing Ingredients

Each compost ingredient has a different Carbon:Nitrogen (C:N) ratio. In order to build a balanced compost pile, try to use a mixture of ingredients instead of just using grass clippings or

vegetable peels. A variety of green ingredients boosts the overall nutrient content while helping to keep a balanced C:N ratio.

One 4' cubic compost pile should be $\frac{1}{4}$ - $\frac{1}{3}$ green materials. So, you will need 16-20 cubic feet of nitrogen ingredients per compost pile.

Pesticides

Grass clippings and garden waste can retain pesticides even through the composting process. These pesticides can harm plants when the compost is applied. Make sure your compost ingredients are chemical-free before introducing them to your pile.

Moisture Content

Nitrogen materials are a key source of moisture within a compost pile ([source](#)), so try to add them as soon as possible. If you are saving up materials to build a pile at one time, try to wait until you've collected most of your brown ingredients before you gather your green ingredients. This will ensure your green materials are still moist and haven't begun to shrink too much.

Cost

One of the major benefits of making your own compost is that you save money and recycle yard waste and kitchen scraps. If the cost of gathering ingredients outweighs the cost of buying a similar amount of compost (about \$45), it may be time to rethink your composting strategy.

Often, it is the green ingredients that are difficult to find in large volumes. You would need about 20 5-gallon buckets of green material to build a balanced 4'x4'x4' compost pile. If that's not possible, consider alternative composting methods like vermicomposting, mini tumblers, and trench composting, which requires far less material at one time.

Accessibility

Again, because green materials are so dense, and don't store well, it's difficult to find an ample amount at one time to build a full compost pile. If your neighbors bag their grass clippings (and they don't spray their lawns), you may have plenty of access to nitrogen ingredients.

However, if you're having a difficult time gathering a sufficient volume of green material, it may be time to look elsewhere:

- Restaurants. Many local restaurants will allow you to pick up old produce if you arrange a time and provide the containers. Make sure you break down large items (like whole melons or heads of lettuce) so they decompose faster.
- Grocery Stores. Some grocery stores have strict policies about disposing of old produce. However, if you're lucky, you can find local grocery stores, farmer's markets, and fruit stands that will part with expired fruits and veggies.

- Farms. These are the dirtiest and perhaps most rewarding sources of nitrogen. Manure has its own set of rules, but it's a great source of nitrogen and other nutrients. If you're willing to do the shoveling and transporting, many farms will happily allow you to clean up after their animals.

Any time you gather ingredients from another person, make sure they are chemical-free, disease-free, and weed-free (as much as possible).

Kitchen Waste

One of the more useful aspects of a compost pile is that you have a place to put vegetable peels, melon rinds, moldy peaches, and rotten tomatoes. Instead of these things sitting in your trash and making it smell, you can get them out of the house and into the compost where they will be useful.

Almost any vegetable or fruit waste is eligible for the compost pile. Breads, meats, and cooked foods (even fruits and veggies) are a no-go.

Canned fruits and vegetables *can* be composted, but if the can is bulging, or the canned food has gone bad, it's safer to toss it out. Canned foods can harbor nasty bacteria, like botulism, which can survive the compost process and spread to plants in your veggie garden. It's not likely, but it's not a risk worth taking.

Tomatoes and potatoes are two ingredients that could cause problems in your compost. Both can carry viruses that infect tomato and potato plants in your garden. If your potatoes have green spots, or your tomatoes look lumpy or have brown spots, throw them away.

List of Acceptable Ingredients

There are many options for green ingredients in your compost pile. The following is a list of common ingredients, along with the average C:N ratio for each:

Hot Greens

Hot greens is the term used for extremely high-nitrogen ingredients. These ingredients are difficult to come by naturally, but all of them have a C:N ratio of 10:1 or less:

- Fish emulsion 3:1
- Blood meal 3:1
- Bone meal 6:1
- Cottonseed meal: 6:1
- Flaxseed meal 6:1
- Poultry manure 8:1

Moist Greens

These are the most common compost ingredients, and they also provide moisture (hence, *moist greens*). These ingredients have a C:N ratio of 10:1-35:1 and are readily accessible to most gardeners:

- Vegetable waste 15:1
- Cow manure 15:1
- Horse manure 15:1
- Alfalfa hay 15:1
- Clover hay 15:1
- Coffee grounds 20:1
- Grass clippings 20:1
- Fresh leaves/weeds 25:1
- Fruit waste 35:1

Carbon



Carbon materials are brown, dry, and bulky. They help with aeration and provide most of the volume of finished compost.

Brown ingredients are easier to store than green ingredients, provided you have the space. A pile of dead twigs doesn't shrink or begin to smell, so you could store it for months until you have enough green material to build a pile.

However, this means you may have a *giant pile of twigs* in your yard for months with no real purpose.

Other high-carbon materials, like [shredded paper](#) or cardboard, can be stored inside in garbage bags. But, again, space becomes an issue. While these ingredients store almost indefinitely, it can be a pain to store them for too long.

Choosing Ingredients

Brown materials vary widely in C:N ratios. While high-nitrogen ingredients range from 3:1-30:1, carbon ingredients can go as high as 900:1. Therefore, you should make sure you use a mixture of brown ingredients in order to keep a balanced pile.

Storing dead twigs, leaves, and straw outside can create one hazard: pests. These piles can provide a nice habitat for mice, snakes, and spiders. Keep the grass around these piles cut short, away from the sides of buildings, and on concrete if possible.

Pesticides

Most carbon-rich ingredients will be pesticide free. Even if they were sprayed, dead twigs and leaves have been sitting so long that the chemicals have worn off. However, it's important to be aware of pesticide exposure in case a pile of leaves gets spray drift from your lawn or salt from salt trucks.

Moisture Content

Carbon ingredients are extremely low in moisture. This makes them easy to store long-term, and helps balance out the moisture provided by green ingredients.

Try to keep stored carbon materials as dry as possible. This will prevent moist habitats for creatures, and helps keep things like shredded paper and cardboard free from mold.

Cost

The cost of collecting carbon-rich ingredients is time and effort.

Brown materials are easier to find than green materials. Grass clippings, leaves, and vegetable peels begin to stink in a few days, so you have to find the right time to gather them.

However, brown ingredients can sit for years without an issue. You can ask neighbors if you can take dead leaves they've raked up, remove old brush piles, or clear out fallen branches. Most homeowners will be grateful for the free labor, and even more happy with free waste disposal.

Paper and cardboard are also easy to come by. Ask the local newspaper for old editions (anything with black ink is fine), and contact grocery stores and department stores to pick up boxes before they're crushed.

Accessibility

Loading up large volumes of dead leaves and old straw will require some basic equipment (or friends with trucks).

By volume, a compost pile will be $\frac{2}{3}$ - $\frac{3}{4}$ brown materials. This means you will need 42-48 cubic feet of carbon materials for one 4'x4'x4' compost pile.

The average long-bed pickup truck can hold 64 cubic feet of material, which is the same as a 4'x4'x4' compost pile. So, when you're picking up brown materials, you need to fill a long-bed pickup $\frac{2}{3}$ - $\frac{3}{4}$ of the way full per compost pile.

Kitchen Waste

Almost all kitchen waste is green. The only exception is egg cartons (not the styrofoam kind). Tear up cartons into small pieces and add them into a garbage bag full of shredded cardboard or paper to store them up for a compost pile.

Eggshells are compostable. They don't count towards the carbon or nitrogen content of the compost pile because they are almost entirely calcium, which makes them a valuable addition. Crush eggshells before adding them to the compost pile.

List of Acceptable Ingredients

Brown materials are fairly straightforward. If it's dead and brown, it's a viable candidate. The only exception is weeds that have gone to seed; these may sprout after the mature compost has been applied.

Browns

These ingredients are high in carbon, but not so high that they will create a nitrogen imbalance. Try to use more browns than dry browns to keep your C:N ratio within range:

- Peanut shells 35:1
- Baled grass (non-legume hay) 50:1
- Dead leaves 55:1
- Straw 75:1
- Corn cobs 75:1
- Corn stalks 75:1
- *Pine needles 80:1

Dry Browns

The dry brown ingredients are extremely high in carbon. Although you could theoretically achieve a 30:1 C:N ratio between dry browns and hot greens, both categories are dry, and the volume of dry browns would be nearly 99% of the compost pile, as the hot greens are very potent powders. Try to make your brown ingredients *at least* 50% browns and *no more than* 50% dry browns.

- Paper towels 100:1
- Shredded newspaper 175:1
- *Sawdust 325:1
- Shredded cardboard 350:1
- *Wood chips 400:1

*These ingredients can vary widely in their C:N ratio, but they can also have a very low pH. Too much may cause an acidic compost.

Amendments

Many compost amendments make big promises, but are little more than hot greens or bacteria in a bag. Both can help kickstart a dead compost pile, but they aren't a fix-all for a passive compost pile, and troubleshooting a compost pile that refuses to decompose is usually as simple as wetting it down and throwing in some rotten apples.

Accelerators

An accelerator is an amendment that is supposed to speed up the composting process. Usually, this is accomplished by adding in some extra bacteria. The idea is that the more bacteria present, the faster the pile will break down.

Technically, this is true. More bacteria = faster decomposition ([source](#)). However, accelerators only provide bacteria that are already present in your compost pile, and they aren't magical. They can only survive in an environment that supports bacterial growth and reproduction, so if you have a dry compost pile, dumping an accelerator on top won't help.

Also, bacteria multiply rapidly under the right conditions. If you keep your compost pile aerated and moist, you won't need to add an accelerator. Active compost heats up because bacteria multiply *incredibly fast* and then start metabolising plant material *rapidly*. An accelerator is pointless if your compost pile is already active.

That being said, Paul has reviewed what he believes to be the [best compost accelerators](#) and provided his suggestions.

Enhancers

A compost enhancer, or additive, is a product that is supposed to add value to finished compost. In general, these are similar to soil amendments that provide a key nutrient, like iron or calcium.

The composting process revolves around bacteria metabolizing plant material and converting it into basic elements. Most enhancers are already plant soluble, meaning they aren't really adding anything to the composting process. It's more like adding salt to your meal; it does enhance the flavor, but it doesn't change or enhance the process.

And, like salt, you can add an amendment at any time and still benefit. Adding iron to compost will (maybe) increase the iron content of your compost. However, it's better to learn to identify iron deficiencies in your plants and apply iron directly to them. You can also add compost, as it helps retain nutrients in any soil, but whether you add an amendment to your compost or directly to a plant, it has the same effect.

Modifiers

Compost modifiers attempt to change the nutritional value or pH of matured compost. Modifiers are usually added to make up for a lack of nitrogen or extremely acidic ingredients.

Bone meal, feather meal, and fish emulsion are common compost modifiers, but they are really just hot greens that pack a punch of nitrogen. If you add hot greens to your compost pile, make sure you measure accurately, and make up for the loss of moist greens with extra moisture.

If the ingredients you are using are acidic, like pine needles or wood ash, you may need a modifier to get the compost process started. Lime is the most common pH modifier to increase pH.

If you have the opposite problem and need to lower pH, you can add pine needles, manure, and small amounts of wood ash.

However, manipulating the pH of a compost pile in either direction is difficult, as bacteria tend to override a modifier and produce a pile with a pH of 5-7 regardless of ingredients.

Learn More About Composting

Thriving Yard has created [extensive resources](#) to help you get started composting. Our library of articles will guide you in getting your compost pile started, keeping it in balance, and creating nutrient-rich organic matter for your garden, flowerbed, or lawn.

About the Author



Sydney Bosque has over 15 years of experience in lawn maintenance, landscape design, and organic gardening. Her first job was watering trees at a nursery, and as payment, she received free flowers.

This led to a love of landscaping, and she spent the next 5 years building up a mowing and landscape business. After she sold it, she went to school and graduated with an A.A.S. in Landscape Design/Organic Produce Production from the Nebraska College of Technical Agriculture.

Sydney has managed greenhouses and college campuses, and now lives with her husband and three children on Catalina Island, California, and is enjoying the challenge of growing an organic garden in the desert.