Gardening Basics

Composting

Compost is decomposed organic material that when integrated into your soil helps mitigate many of the challenges North Texans gardeners may face when growing plants. Builders often add mostly sterile topsoil to new build sites, and some native soils may contain heavy clay that doesn't allow proper drainage and uptake of nutrition. Beneath the soil we often find hard pan alkaline soils. Fortunately, nature creates compost automatically. Materials all break down eventually and become compost. However, this natural process takes a long time—one to two years. You can speed up the process by starting your own composting system.

Benefits

- Utilizes the bounty of fall leaves, yard waste, and vegetative kitchen waste.
- Reduces the amount of household waste that reaches the landfill
- Provides nourishment for the garden
- Produces free fertilizer and mulch
- Means better stewardship of our environment

Preparation/Planning

The best area for establishing a composting site is on the bare ground so that composting organisms have contact with both soil and the atmosphere. The pile should not be placed in direct sunlight which can be hostile to micro-organisms. Your compost pile should not be saturated but only kept moist as this will prevent it from becoming anaerobic. Choose a convenient location to allow easy access for turning and moistening.

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Tools & Materials

- Depending on the amount of raw materials you want to compost, you can choose to build a set of composting bins made of wood or cinder block, create a wire mesh enclosure to hold yard and food waste, or invest in a manufactured bin or tumbler.
- Garden fork or pitchfork for turning the pile

Warnings

- Do NOT put meat, fats, dairy products, diseased plants, or pet feces into your pile.
- Do NOT use grass clippings or other vegetation that may have been exposed to persistent herbicides or pesticides. Manure from cows and horses may be added if the animals have not been fed hay treated with persistent herbicides. Chicken manure is hot (high nitrogen content) and needs time to break down before using in the garden.

Components needed for successful composting:

1. Material

Adding the right ingredient mix is the secret to making a compost pile work for you. Composting professionals talk about green and brown ingredients. "Greens" provide nitrogen while "browns" add carbon. A simplified recipe is equal proportions by weight or if using volume -- 2/3 brown to 1/3 green.

Examples of green ingredients:

- Fruit and veggie scraps
- Eggshells
- Tea bags, tea leaves
- Fresh green grass clippings and plant trimmings (grown without pesticides or weed killers)
- Garden refuse
- Coffee grounds

Examples of brown ingredients:

- Chopped dry leaves, dried grass clippings
- Wood shavings or sawdust
- Straw
- Nuts and shells
- Untreated coffee paper filters
- Pinecones, pine needles—chopped
- Shredded newspaper and other paper products
- Twigs
- Peanut shells

Tip: Keep a couple of large BLACK (more heat absorbent) trash bags full of leaves (with plenty of holes poked through the sides to let the AIR in) next to your compost bin. After dumping a gallon bucket of greens into the bin add enough leaves to thoroughly cover the greens.

Tip: If greater precision on ingredients for composting is desired, online software will help assess the carbon to nitrogen ratio (C:N) for each ingredient type and the amount being added. Quantities can then be adjusted to reach the desired ratio of 30 (carbon) to 1 (nitrogen) or 30:1. Cornell University offers a "Compost C:N calculator":
https://compost.css.cornell.edu/download.html

Common compostable materials and their respective ratios:

Organic material	C:N ratio	Organic material	C:N ratio
Alfalfa hay	12:1	Cornstalks	60:1
Food waste	15:1	Leaves	60:1
Grass clippings	19:1	Straw	80:1
Rotted manure	20:1	Sawdust	500:1
Fruit waste	35:1	Wood	700:1

From *Composting and Mulching: A Guide to Managing Organic Landscape Refuse* by Wayne J. McLaurin (retired) and Gary L. Wade, Extension Horticulturists, The University of Georgia Cooperative Extension Service.

2. Mass

Under proper conditions, a composting pile will heat to a temperature of 70° to 100° as energy is released by the breakdown of raw materials. For more rapid decomposition and killing weed-seeds, and bacteria, a pile requires a hot temperature—about 140° Fahrenheit. To achieve a high temperature, a pile should be fairly large, the ingredients added all at once, and the pile turned frequently. It needs to be big enough to retain heat and moisture, but small enough so air can penetrate to the center of the pile. Ideally, a pile will be 3 feet in height, length, and depth, 3' x 3' x 3' = 27 sq. ft. If your pile is smaller, understand your composting will take longer.

3. Air

Turn over or rotate the pile. While the composting process can be anaerobic (no oxygen), it's best to stick with the aerobic (with oxygen) process. Composting happens more quickly if the pile is turned once or twice a week.

4. Moisture

A regularly maintained pile with a proper mixture of ingredients and moisture will successfully decompose organic materials. A pile should be moist but not sopping wet. Think of a damp sponge that, when squeezed, releases just a few drops. If it's too wet, no air will circulate, resulting in slimy and smelly contents. Conduct a squeeze test to gauge the moisture content of the compost materials. Add water until squeezing a handful will yield one or two drops of water. Adding too much water may leach out nutrients.

Tip: --If your pile is too wet, add more carbon. If it is too dry, add more nitrogen.

5. Time

Over time the temperature of the pile will increase. The more microbial activity taking place in the compost pile, the greater the increase in temperature within the materials being composted. Higher temperatures help the breakdown of organic materials.

The final stage of composting is called curing the pile. During this time, the pile cools down to ambient temperature and does not require turning or added moisture. The size of the pile should be one-half to one-third of its original size. This may take a couple of months, or the pile can be left unattended for several months before mixing into your garden soil. You will not be able to recognize most of the original materials in your finished pile and what remains should be dark and crumbly. The smell should be slightly sweet. You may choose to screen out the stubborn ingredients like eggshells, corn cobs, and wood chips that did not fully decompose, but that is not essential. When the compost is ready to use, mix it into the soil about 6 inches deep to provide nutrition for plant roots.

Tip: Particle size affects how quickly your materials break down – the smaller the better. Chop up anything larger than a quarter. Yes, it takes a little extra time, but the results will be worth it.

Trouble Shooting:

Symptoms	Problem	Solution
The compost has a bad odor.	Not enough air	Turn it. Add dry material if the pile is too wet.
The compost is not breaking down, and the center of the pile is dry.	Not enough water	Moisten and turn the pile.
The compost is damp and sweet-smelling but will not heat up.	Not enough nitrogen	Mix in a nitrogen source such as fresh grass clippings, fresh manure, or blood meal.
The compost is damp and warm only in the middle.	Too few materials and too small area	Collect more material and mix the old ingredients into a new, larger pile.
From *Composting and Mulching: A Guide to Managing Organic Landscape Refuse* by Wayne J. McLaurin (retired) and Gary L. Wade, Extension Horticulturists, The University of Georgia Cooperative Extension Service.		

Resources:

DCMGA, "Gardening from the ground up – soil and composting", (accessed 1 Dec 2024), https://www.dcmga.com/garden-basics-ground-up-gardening/

Masabni, Joseph and Patrick Lillard, Texas A&M AgriLife Extension, "Composting", (accessed 1 Dec 2024), https://aggie-horticulture.tamu.edu/wp-content/uploads/sites/10/2013/09/EHT-069.pdf

NC State Extension, "Herbicide Carryover in Hay, Manure, Compost, and Grass Clippings", (accessed 1 Dec 2024), https://content.ces.ncsu.edu/herbicide-carryover

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Texas A&M AgriLife Extension, "Chapter 3, Composting Structures", Earth-Kind® Landscaping, (accessed 1 Dec 2024), https://aggie-horticulture.tamu.edu/earthkind/landscape/dont-bag-it/chapter-3-composting-structures/

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