Backyard Composting

Waste to Resources

LSU AgCenter Research & Extension

This publication explains what composting is and how it works, and it describes different composting systems. Solutions to problems that may arise are provided as well as suggestions about how to use your compost. The list of resources will help you learn more about composting.

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Tiny living things do much of the work of breaking down organic materials to form compost. These tiny workers are called microorganisms and include such things as bacteria and fungi. Animals living in the soil help microorganisms break down organic materials. Worms and pill bugs are examples of soil animals that help change organic waste into compost.

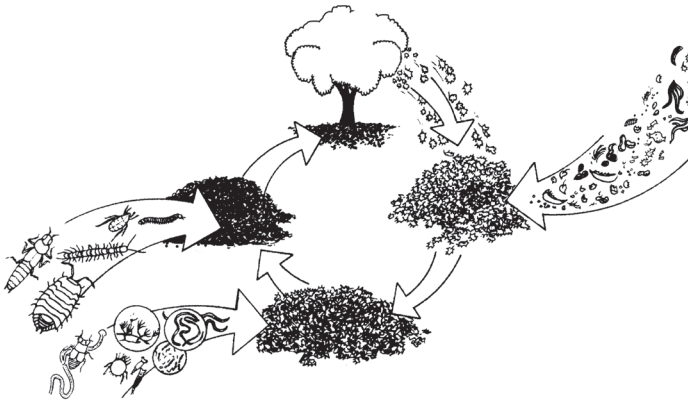
As microorganisms and soil animals turn organic materials into compost, they use the organic materials as food. The organic materials provide nutrients for growth and activity. Eventually, these nutrients are returned to the soil, to be used again by trees, grass and other plants. This is nature's way of composting and recycling!

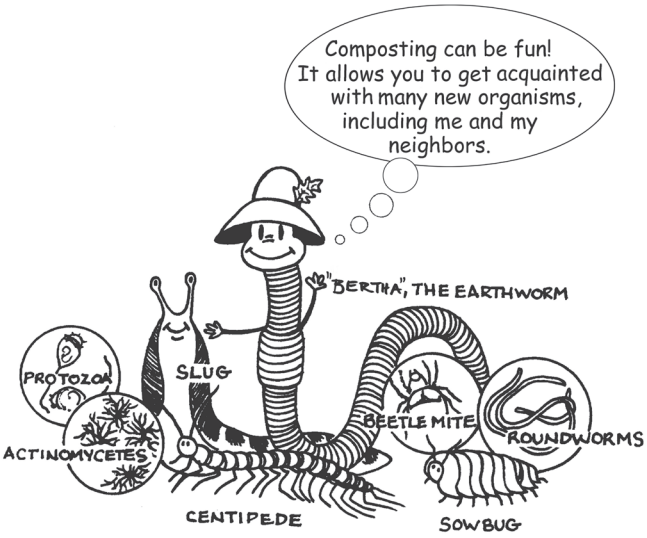
Section I

Welcome to Composting

What is Composting?

Composting occurs naturally nearly everywhere! Leaves drop from trees. Grass clippings are left after mowing the lawn. Plants and animals die. Over time, these organic materials break down or decompose. The rich, dark, soil-like material that results is called compost.





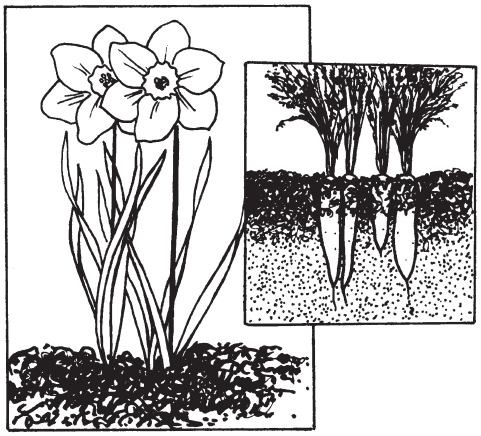
Why Compost?

With the composting methods described here, you can help the composting cycle work even better than it does in nature. The organic waste you put back into the environment can be used by other living things. This way, instead of going to a landfill or garbage-burning plant, your wastes become valuable resources.

Reasons to Compost

Yard waste and food scraps make up 20 percent to 30 percent of garbage! Many landfills are filling up and closing. Finding places to put garbage is a big problem. By composting yard and kitchen waste, you send less garbage to landfills.

Gardeners use compost. Compost allows the soil to hold more water and adds nutrients to the soil. Flowers, vegetables, trees, shrubs, house plants, lawns and container gardens grow better in soil mixed with compost.



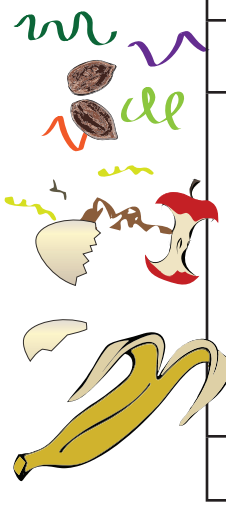
Best Ever Compost

Just Follow the Recipe!

Composting is like baking a cake. Simply add the ingredients, stir, "bake" and out comes - compost!

Whether you compost kitchen waste or yard and garden waste, there are a few basic steps to follow. Here are the necessary ingredients and general directions for composting.

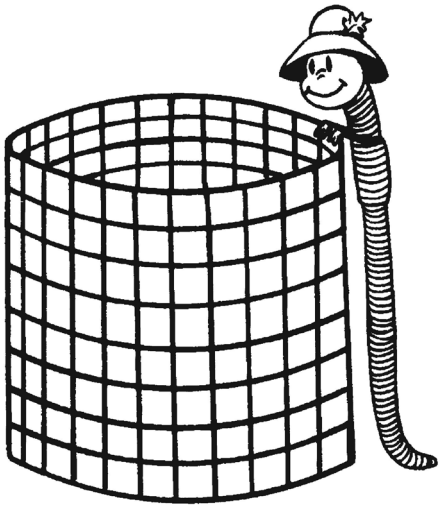
Ingredients



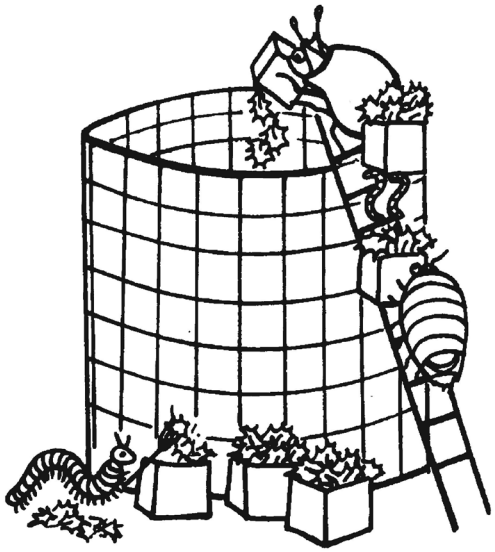
Kitchen Compost	Yard or Garden Compost
Add a mixture of some or all of these ingredients:	
vegetable peels and seeds eggshells fruit peels and seeds nutshells coffee grounds any other vegetable or fruit scraps	hay or straw wood chips weeds and other garden waste grass clippings leaves manure ashes shredded paper sawdust
Note: Do not add meat scraps, bones, dairy products, oils or fat. They may attract pesty animals.	

Best Ever Compost Directions

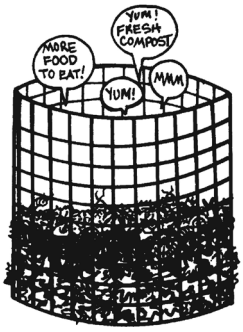
1 Choose a "pot" for baking your compost. Any type of composting bin will do.



2 Place kitchen or yard waste in the composting bin. Chop or shred the organic materials if you want them to compost quickly.

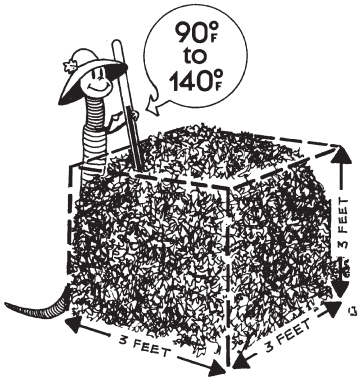


3 Spread soil or "already done" compost over the compost pile. This layer contains microorganisms and soil animals that do the work of making the compost. It also helps keep the surface from drying out.



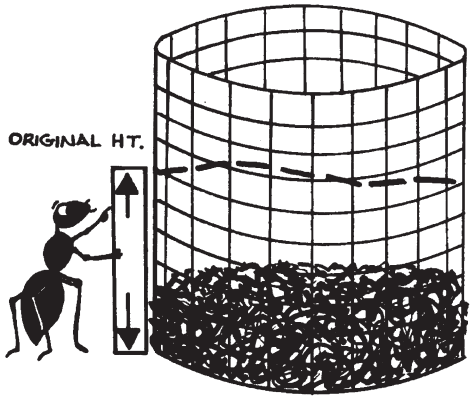
4 Adjust the moisture in your compost pile. Add dry straw or sawdust to soggy materials, or add water to a pile that is too dry. The materials should be damp to the touch, but not so wet that drops come out when you squeeze it.

5 Allow the pile to "bake." It should heat quickly and reach the desired temperature (90° to 140°F, or 32° to 60°C) in four to five days.



6 Stir your compost as it bakes if you want to speed the baking time.

7 The pile will settle down from its original height. This is a good sign the compost is baking properly.



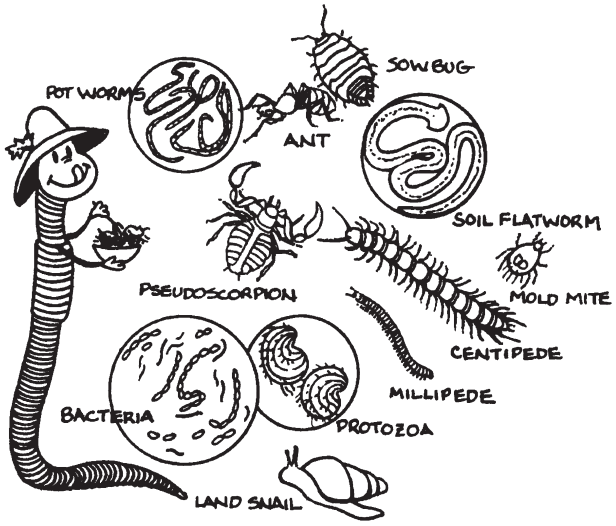
8 If you mix or turn your compost pile every week, it should be "done," or ready to use, in one to two months. If you don't turn it, the compost should be ready in six to 12 months.

9 Your "best ever" compost should look like dark crumbly soil mixed with small pieces of organic material. It should have a sweet, earthy smell.

10 Feed compost to hungry plants by mixing it with the soil.

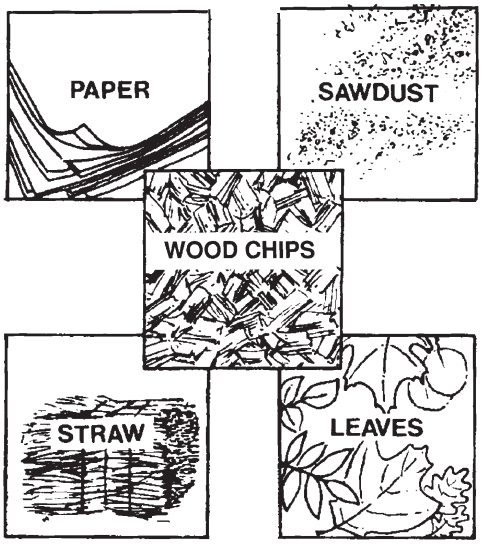
How Does Composting Work?

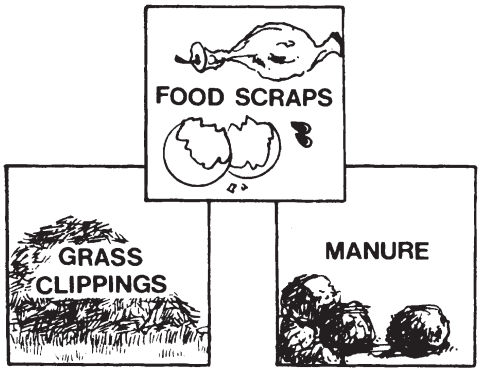
1 We are the key to composting. Normally, we live in the soil and eat small tidbits of organic matter such as leaves and twigs that nature provides. We'd like to have more to eat. A lot of the things you call waste - for example, banana peels, rotten apples, brown wilted lettuce, fallen leaves and weeds from your garden - are food for us.



2 We need a balanced diet! We need carbon for energy and nitrogen to help build our bodies. Some of your wastes are high in carbon. These include:

paper
sawdust
wood chips
straw
leaves



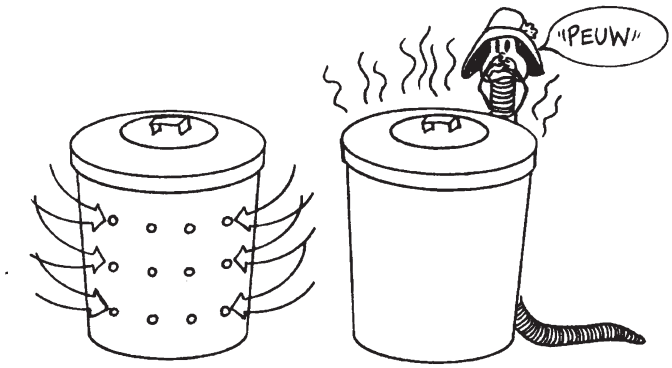


Other wastes are high in nitrogen. These include:

food scraps
grass clippings
manure

Be sure to include a mixture of wastes high in nitrogen in your compost pile.

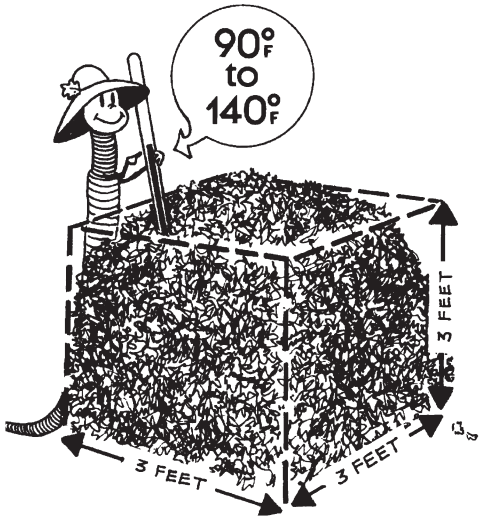
3 Don't smother us! We need air to survive. Be sure your compost container has holes to allow air to get into the compost pile. If possible, stir or turn your compost pile every week or so to let in more air. If we don't get enough air, many of us will die, and other microorganisms that don't need air will break down the waste in your compost pile. These organisms give off a nasty smell and are slow workers. I think you'd prefer us in your compost pile!



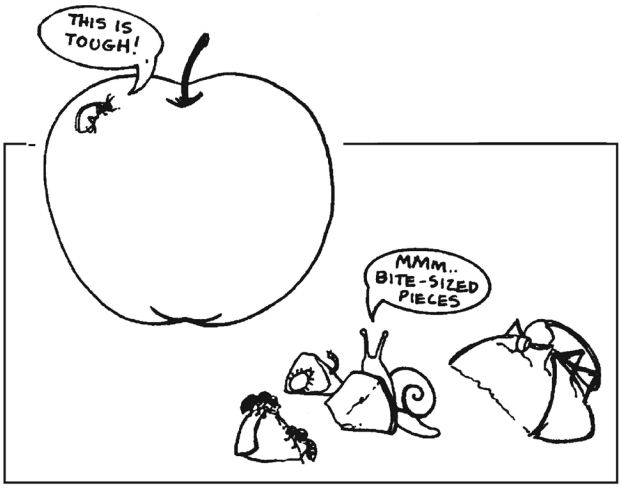
4 Don't let us dry out! We need water. Your compost pile should be about as moist as a sponge that has just been wrung out. If there is not much rainfall, add water to your compost pile.

5 Don't let us get cold! We like temperatures of 90° to 140°F (32° to 60°C). If the temperature is too low in your compost pile, many of us will die, and other microorganisms that work more slowly than we do will come into your pile.

If your compost pile is too small, we'll feel the cold air coming in from the sides. The best way to keep us warm is to build a pile at least 3 feet x 3 feet x 3 feet (1 meter x 1 meter x 1 meter).



6 We must be able to get to our food! It's harder for us to eat large pieces of food than to eat small pieces of food. For example, if you throw a whole apple into your compost pile, only a few of us can eat it at a time. If you cut up your apple into small pieces, then a lot of us can get to eat at once.

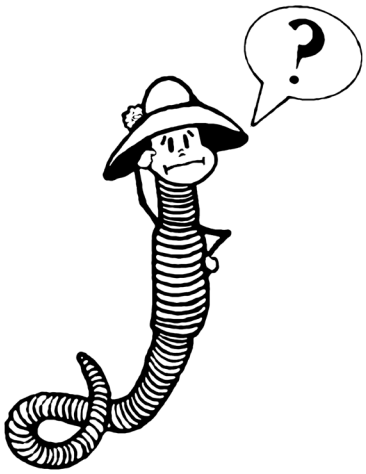


7 If you supply all these things - food, air and moisture in a good-sized pile - we'll be glad to make compost for you. Our job can take from six weeks to three years, depending on how you care for us. When we have completed our work, the compost will be ready to help your plants grow.

Section II

Which Composting System Is for Me?

There are many ways to compost waste. Some methods need a backyard, and others can be used by apartment dwellers. The method of composting you choose will depend on whether you plan to compost yard waste or kitchen waste, how much money and time you wish to spend, how much room you have and how soon you need the compost. To determine which composting system is for you, first decide whether you will compost yard and garden or kitchen waste. Then read the brief comparisons of the different systems on the chart. More information on each composting system follows.



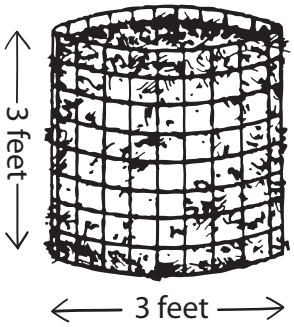
System Used	Cost	Time for Finished Compost (Rate of Composting)
Yard Waste		
Compost mound	None	Slow if not turned; fast if turned often
Holding unit		
Turning unit		
Commercial bin		
Kitchen Waste		
Garbage can	Low	Slow; faster if turned or composter mixed
Worm composting bin	Medium	Fast, minimum 4 weeks
Turning unit	High	Fast, minimum 6 weeks
Note: Kitchen and yard wastes can be composted together, but the combination may attract rodents.		

Composting Systems

Wastes can be composted using any of a number of systems, from simple to elegant. The simplest designs are inexpensive and require relatively little work. The fancier systems - for example, a wood and wire turning unit or a worm composting bin - can cost $100 or more. These descriptions are a brief introduction to the different types of composting systems.

Holding Unit

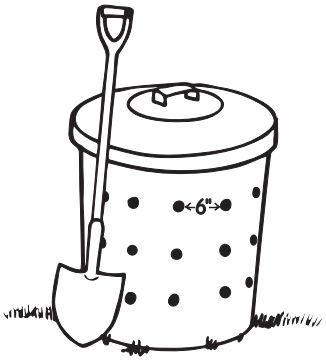
A holding unit can be any simple container that holds your yard and garden wastes while they break down. Once your holding unit is built, no other work is required except placing the wastes into the container. Because the amount of air reaching the waste is not increased by turning, this method takes a relatively long time to produce compost - from six months to two years. You can speed the process by chopping or shredding the waste.



Nonwood materials such as grass clippings and garden weeds work best in a holding unit. These materials can be added continuously.

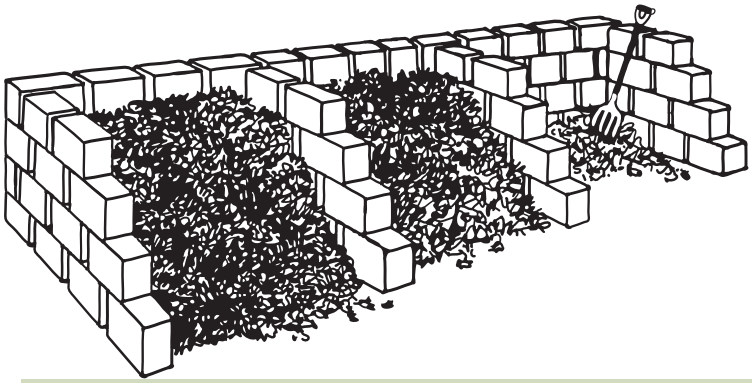
Garbage Can

A garbage can may be used to compost food waste. This system is not fancy, but it works. It's best to turn your composting waste with this method.



Turning Unit

A turning unit looks like three holding units placed side by side. While the compost in one bin is "cooking," you add waste to the empty bin right next to it. As you might have guessed from its name, in a turning unit the waste is stirred or turned every week or so. This speeds the composting process by allowing more air to reach the microorganisms and soil animals in the compost pile, but it requires a lot of time and energy!



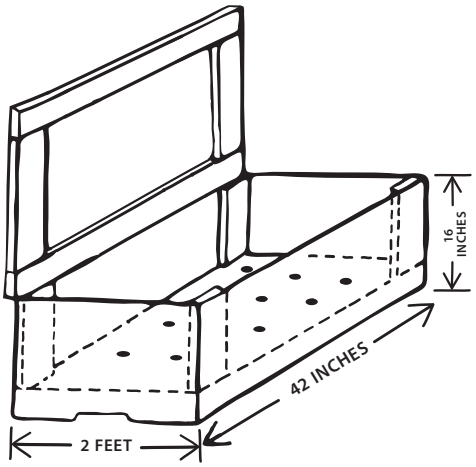
You can use a turning unit for either yard or kitchen wastes. If you plan to compost food scraps, be sure to build a unit that prevents nuisance animals from getting to the wastes.

When putting wastes in a turning unit, do not add too much of any one material at a time. This is important because the microorganisms in the turning unit need a variety of nutrients. Either add thin layers of different kinds of organic materials or mix your wastes together.

When the microorganisms in a turning unit have the right mixture of nutrients and enough air, they work quickly and give off a lot of heat. The organic materials in a turning unit can heat up to about 150°F (66°C). If you turn your compost pile as the temperature starts to drop, the microorganisms get more air and a new mixture of materials. They start working hard again, and your pile heats up. Keep turning your pile until the compost is ready. A "hot" pile in Louisiana makes compost in about two months. You can design and make your own turning unit by using either cinder blocks or wood to build three holding units right next to each other.

Worm Composting Bin

A worm composting bin, if built with care, can look quite elegant and can even be used as a bench. After you have built the bin, provided bedding and located a source of worms, a worm bin requires relatively little maintenance. Simply add kitchen wastes as they become available.



Section III

My Compost Isn't Working

Use this chart to identify and fix problems in your compost pile. It shows the importance of air, moisture and the size of the pile when making compost, as well as the need to balance wastes and protect the pile from nuisance animals.

Symptom	Problem	How to Fix It
Pile is wet and smells like a mixture of rancid butter vinegar and rotten eggs	Not enough air	Turn pile
	Or too much nitrogen	Add straw, sawdust or wood chips
	Or too wet	Turn pile and add straw, sawdust or wood chips; provide drainage
Pile doesn't heat up	Pile is too small	Make pile larger
	Or pile is too dry	Add water
Pile is damp and sweet smelling but will not heat	Not enough nitrogen	Add grass clippings or other sources of nitrogen
Center is dry and contains tough materials	Not enough water	Add water and turn
Pile attracts animals	Meat and other animal products have been added	Keep meat and other animal products out of pile; enclose pile in 1/4-inch hardware cloth

Section IV

What Can I Do with My Compost?

1 Spread compost on your garden before roto-tilling or turning the soil in the spring. Then mix the compost into the soil while roto-tilling or turning.

2 Place or bury compost in your garden between plant rows. The plant roots will grow into the compost and take up the nutrients.

3 In flower gardens, dig in compost around the plants.

4 Use compost as a mulch for shrubs, trees and plants.

5 When transplanting house plants, mix compost into the soil.

Composting Don't!

Don't use compost to sprout tender seed. The seed may be killed by a fungus in the compost that causes damping-off disease.

Section V

Glossary

Actinomycetes Microorganisms that have the characteristics of both fungi and bacteria. Actinomycetes create cobweb-like growths throughout the compost and give it an earthy aroma.

Bacteria In a compost pile, the microorganisms that do most of the work to decompose wastes. Hardworking bacteria cause the compost pile to heat. Under a microscope, bacteria look like small round or rod-shaped organisms.

Carbon An element that is abundant in wood chips, sawdust, straw and leaves. Carbon provides energy for living things.

Celsius (C) A temperature scale in which 0° is freezing and 100° is boiling. [Degrees Celsius = 5/9 x (degrees Fahrenheit 32)]

Compost A rich soil-like mixture produced when organic materials break down.

Compost mound A pile of yard, garden or kitchen wastes not contained by a bin; the wastes take six months to two years to break down, depending on the amount of good management.

Composting Converting organic wastes into a rich soil-like material.

Composting system The method used to convert organic wastes into compost (a compost mound, a compost pocket, a holding unit or a turning unit).

Damping-off disease A plant disease caused by a fungus that damages plant roots; the damping-off disease fungus is found in soils and compost and may cause young plants to die.

Decompose To break down or rot.

Fahrenheit (F) A temperature scale in which 32°F is freezing and 212°F is boiling. [Degrees Fahrenheit = (9/5 x degrees Celsius) + 32.]

Fungi Organisms such as molds, yeast and mushrooms that feed on dead organic matter.

Holding unit A simple container that holds yard, garden and kitchen wastes while they break down.

Invertebrate An animal without a backbone, such as an insect or worm.

Kitchen wastes Food scraps, such as potato peels, apple cores, moldy food and wilted lettuce.

Microorganisms A tiny living thing that is so small you need a microscope or magnifying glass to see it. Microorganisms help break down organic wastes.

Millipede A tiny worm-shaped animal with many pairs of legs. Millipedes live in soil and compost.

Mite A tiny animal, no bigger than a pinhead, that lives in soil and compost.

Mulch A covering, such as leaves, straw, peat moss or compost, that is placed on top of the soil in gardens and around trees. Mulch suppresses weeds, keeps soil moist and keeps plant roots cool in summer and warm in winter.

Nitrogen An element found in food scraps, grass clippings and manure. Nitrogen is used by living things for growth.

Nutrient A food ingredient that supplies energy for living and growth.

Organic material Matter that has come from living things (plants and animals).

Perlite/vermiculite A lightweight material used for starting plant seed.

Pill bug A small animal that lives in moist soil and rolls up in a little ball when it is threatened or scared.

Potworm A small worm that lives in soil and compost.

Roundworms (also known as nematodes) The most abundant invertebrates in the soil. These small worms (less than one centimeter) prey on fungal spores, protozoa (a type of microorganism) and each other and are very good for compost.

Solid waste Household trash, yard and kitchen wastes, old machinery and equipment, and many agricultural and industrial wastes-items that people discard.

Turning In a compost pile, mixing and moving the organic material.

Turning unit Three holding units built next to each other. After compost has been in one bin long enough to start breaking down, it is turned into the next bin. Wastes from the top and sides are put on the bottom and middle, and wastes from the bottom and middle are put on the top and sides. This way, more air reaches the compost and it breaks down quickly. New wastes are added to the empty bin rather than to compost that is already started.

Yard and garden wastes Grass clippings, dead leaves, small branches and weeds.

Section VI

Finding Out More about Composting

Contact an agent in your parish LSU AgCenter Extension Office for more information on backyard composting – as well as a variety of other topics including 4-H youth development, family and home, crops and livestock, lawns and gardens, and much more. To find the LSU AgCenter office nearest you, check your local phone listings or visit www.lsuagcenter.com. (If you don't find LSU AgCenter listed in the business pages of your phone directory, try "county agent" or "extension service" in the blue pages or government services listings of your phone book.)

LSU AgCenter composting publications:

Backyard Composting Series:

Cinder Block Bin, #2610-C, rev 1/10
Cinder Block Multiple Bin, #2610-D, rev 1/10
Composting Mound, #2610-E, rev 1/10
Composting Mulch, #2610-F, rev 1/10
Garbage Can Composter (online only), #2610-B, rev 1/10
Wire Mesh Bin, #2610-G, rev 1/10
Wood and Wire Three-Bin Turning Unit, #2610-I, rev 1/10
Wooden Box Bin, #2610-H, rev 1/10
Worm Composting Bin, #2610-J, 11/95
Basic Principles of Composting (online only) #2622, 12 pp., 4/96
Static Pile Backyard Composting (online only) #2516, rev 5/94
Troubleshooting Your Compost Pile (online only) #2517, rev 11/99

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