

GROW YOUR OWN: COMPOST

GARDEN RECYCLING

Many people practice the “three R’s” of conservation. They **Recycle**, **Reuse** and **Reduce**. If you apply the “three R’s” to yard trimmings and leftover food, then you have **composting** - an economical way to reduce garbage, reuse organic materials, and recycle nutrients as a soil conditioner.

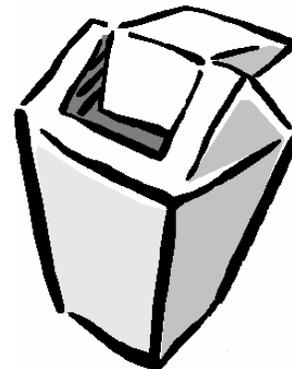
Organic: living or previously living materials.

Look at what is in your garbage. Do you see any foodstuff - banana peels, fuzzy leftovers, coffee grounds? Do you have any yard trimmings - grass, small twigs? These types of materials are easy to compost.

WHAT’S IN MY GARBAGE?

Write down some of the foodstuff in your garbage:

E.g banana peels



WHAT IS COMPOST?

Composting is the process by which organic materials (such as branches, leaves, and fruits) biologically decompose under controlled conditions to produce *humus*, which is a more stable form of organic matter.

BENEFITS OF COMPOST

When mixed with soil, compost can help make the soil looser, which makes water, oxygen, carbon dioxide, and minerals (plant food) more available to growing plants. Compost saves water by helping the soil hold on to it better.

COMPOST

HOW COMPOSTING WORKS

A balance of five important ingredients is the key to quick, trouble-free composting:

- Water
- Oxygen (air)
- Carbon
- Nitrogen
- Decomposing organisms

An easier way to think about nitrogen and carbon is to think of them as 'greens' and 'browns'.

'Greens' are things that contain a lot of water and decompose quickly. Green things are alive. For example one or more of these: Grass clippings. Fruit and vegetable trimmings. Fresh, leafy garden trimmings. Palm leaves (chopped/shredded). Kitchen scraps like coffee grounds, egg shells, leftover bread, rice. Seaweed and aquatic plants (washed to remove salt).

'Browns' are things that are dead. For example one or more of these: Chipped trees. Twigs, small branches from trees and shrubs (chopped). Sawdust (from untreated wood). Stems of fibrous grasses. Newspaper or white paper (shredded). Dry brown leaves



On page 1 you made a list of your 'greens' (kitchen waste). Now make a list of the 'browns' you have:

DO NOT PUT THESE THINGS IN YOUR COMPOST

- Dog or cat feces, used kitty litter - these are human health hazards
- Oils/Fats. Dairy products. Meat or bones of animals, poultry, fish - these may attract flies, rats or other animals.

COMPOST

YOUR COMPOST PILE

Basic compost heap: Simply pile and mix the compost materials on the ground. The pile should be at least 3 feet high by 3 ft wide by 3 ft long to get hot enough on the inside. Cover the pile with a tarp or plastic when it rains to prevent it from getting too wet. Turn the heap regularly with a fork (every two weeks).

Bins: Can help to contain the compost heap, keep it out of sight, and can make it easier to turn. They can be made of concrete blocks, wire mesh, or wood (although wood may lead to termite problems).

Turning bins: Some commercial composting units have rotating barrels that make mixing the pile easier and reduce the use of shovels or forks for turning.

The speed of composting varies, but at some point the center of the pile should feel hot or very warm to the touch.

MAKING THE PILE

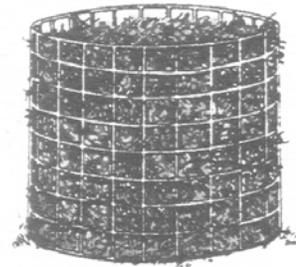
Make the compost in layers and add kitchen waste every day.

Start the compost pile with a layer 4-6 inches thick of plant material such as small twigs or chopped corn stalks (browns). This will help with aeration and drainage. Wet this layer.

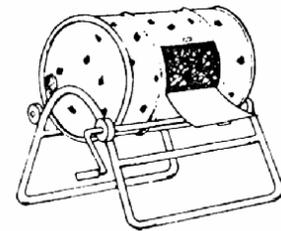
Add a layer of greens. Green layers should be no more than 1 or 2 inches thick. Food scraps may make up part of this layer. Make sure the food scraps are covered with browns to discourage scavengers.

Keep building by adding browns then greens, adding water as needed. Brown layers should be two to three times as thick as green layers.

WIRE MESH PILE



TURNING BIN



A Rotating Barrel Composter



For more information: CTAHR Publication 'Backyard Composting' HG41.
<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/HG-41.pdf>

COMPOST

MANAGING THE PILE

- The pile should always be as wet as a wrung out sponge.
- Turn or mix the compost heap every 2 weeks to help it rot and break down.
- The hotter the pile, the faster the composting process.
- If the pile is too wet, turn it to allow air in and improve drainage, protect from rain.
- If the pile is too dry, water it and turn it.

COMPOST PILE PROBLEMS AND SOLUTIONS

Symptoms	Likely problems	Solutions
Bad smell	Not enough air	Turn and 'loosen' pile
Ammonia smell	Too much 'greens'	Add 'browns'
Pile doesn't get hot	Not enough 'greens'	Add 'greens'
Pile attracts flies and other animals	Wrong materials	Don't use meat, oils

WHEN IS IT READY?

The pile should be much smaller than its original size, and the original materials should no longer be recognizable. The compost should be dark, loose (crumbly), and should not have any strong or unpleasant odor.

HOW DO I USE IT?

Use the compost to mix into the soil or to make compost tea* to use for watering crops and seedlings. Spread compost on your vegetables, and also your trees, flowering plants, lawn and under shrubs.

* see 'Grow Your Own: Food & Water' lesson for information about compost tea

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VERMICOMPOSTING

COMPOSTING WITH WORMS

WHY VERMICOMPOSTING?

Using worms to decompose food waste offers several advantages:

- It produces a free, high-quality soil amendment (compost)
- Worm poop, or vermicast, recycles nutrients back to the soil.
- It requires little space, labor, or maintenance;
- Free worms for fishing!



EQUIPMENT AND SUPPLIES

The materials are simple and inexpensive. All you will need are a worm bin, bedding, water, worms, and your food scraps.

WORM BIN

The bin size depends on the amount of food produced by your household. The general rule of thumb is one square foot of surface area for each pound of garbage generated per week.

The average family generates four pounds of food waste per week, so a box 2 feet wide, 2 feet long, and 8 inches deep should be adequate.

To provide the worms with air and for drainage, drill nine ½ -inch holes in the bottom of the 2-foot-by-2-foot bin. Drilling holes on the upper sides of your bin will also help your worms get needed oxygen and prevent odors in your worm bin. Place a plastic tray under the worm bin to collect any moisture that may seep out. Keep a lid on the bin, as worms like to work in the dark.

GETTING WORMS

It is important to get the type of worms that will thrive in a worm bin. Compost worms are NOT the worms you find in the soil. Soil worms require soil to survive so do not put them in a worm bin. It is **illegal to import worms** into the state of Hawaii*. Do not mail-order worms from the U.S. mainland or any other location outside Hawaii. Within Hawaii, there are various suppliers of compost worms - check the internet for details. Search "worms Hawaii".

*(and can result in fines of up to \$200,000)

VERMICOMPOSTING COMPOSTING WITH WORMS

PREPARING THE BIN

The worms need bedding material in which to burrow and bury the garbage, in addition to food. Shredded paper or newspaper, and shredded cardboard are good bedding materials for worm composting. Do not use glossy paper or magazines. Soak the bedding well with clean water and then squeeze it to remove excess liquid. The bedding should be damp, like a wrung out sponge. Worms will eat the bedding, so you will need to add more within a few months.



- Spread a 1–2 inch layer of damp bedding on the bottom of the bin
- Add compost worms to the bedding; no need to spread them out.
- Add a small amount of food scraps to the bin, about 1–2 cups.
- Cover the scraps with another layer of damp bedding. Make sure all food scraps are covered with bedding material.
- Replace the lid. Excess moisture will drain to the tray below the bin. Remove any liquid and use it in your garden or outdoor compost pile.

MAINTAINING YOUR BIN

Worms like the “3 Ds” - Damp, Dark, and Dinner!

DAMP: worm bin bedding should be damp, like a wrung-out sponge, but not soggy. Worms will die or try to escape if the bin is too wet or dry.

DARK: worms are sensitive to light and should be kept in a *dark* environment. If worms are trying to escape, it is a signal that conditions are not ideal inside the bin. If the bedding dries out, use a plant mister to spray some water on it.

DINNER: worms love to eat! Feed your worms any non-meat organic waste such as vegetables, fruits, eggshells, tea bags, coffee grounds, paper coffee filters, and shredded garden waste. Break or cut food scraps into small pieces so they break down easier. Do not add meat scraps or bones, fish, greasy or oily foods, fat, tobacco, or pet or human manure. A pound of worms can eat up to 2 pounds of food scraps each day.

For more information: Small scale vermicomposting
<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/HG-45.pdf>