

# GROWING GARDENS

From

# GARBAGE:



A Guide to *Composting,*  
*Mulching and Grasscycling*





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# DON'T TREAT YOUR SOIL LIKE DIRT

*"To forget how to tend the soil  
is to forget ourselves."*

*Mahatma Gandhi*

What is the single most important thing you can do to grow a lush and healthy lawn and garden? Improve your soil! Soil is more than just a growing medium, it is the very heart of your garden. The true secret to healthy plants and lawns is healthy soil.

The soil beneath your feet is a living part of the landscape, teeming with an incredible community of organisms that forms a soil food web. Just one teaspoon of healthy soil alone may contain 4 billion organisms! From microscopic bacteria and fungi to earthworms and springtails, all plants depend upon these hardworking soil organisms. As these soil organisms eat and



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move through the soil, they store and release essential nutrients to plants, turn and aerate the soil, trap and breakdown pollution, and they even help plants fight diseases and insect pests.

The easiest thing you can do to grow healthy soil is to add compost! Compost adds organic material and nutrients that nourish soil organisms and will help you to grow stress-free plants that require less water, fertilizer and pesticides. With food and yard waste making up almost 30% of California's waste stream, composting and grasscycling are gardening practices that provide you with an easy way to recycle these wastes, turning garbage into fertilizer.

This booklet describes three methods for creating healthy soil to help you grow great vegetables, vibrant flowers and lush, green lawns. These methods are:

- composting,
- mulching
- grasscycling

All of these practices will help you grow a healthy, sustainable garden without the use of toxic chemicals.

### **KICKING THE CHEMICAL HABIT:**

Relying on synthetic, chemical fertilizers can sometimes cause problems in the garden:

- Fertilizers high in nitrogen can encourage a burst of new growth in plants that can attract sucking insects and create leggy growth habits.
- Too much fertilizer can alter the pH of the soil making it more difficult for plants to absorb nutrients.
- Strong fertilizers can harm soil microorganisms essential to garden health.
- Run-off from over-watering and from rain can wash fertilizers into storm drains where they can flow directly into local creeks causing algae blooms and fish kills.

If you decide to purchase plant food for your garden, choose an organic fertilizer. If you do choose a chemical fertilizer, purchase one that is in a slow-release form.

### **DID YOU KNOW:**

*One acre of healthy topsoil may contain 900 pounds of earthworms, 2,400 pounds of fungi, 1,500 pounds of bacteria, 133 pounds of protozoa, and 890 pounds of arthropods!*

# **C**OMPOSTING WITH FOOD & YARD WASTE THE SECRET TO GREAT SOIL

Compost is a nutrient-rich soil amendment naturally produced when plant and animal wastes decompose. Making compost is an easy and inexpensive way to copy nature's recycling system and turn your yard and kitchen wastes into a high quality fertilizer for beautiful, healthy plants.

## **WHY COMPOST**

Compost is a key ingredient in keeping your soil healthy. It is packed with the nutrients soil organisms and plants need, including many micronutrients missing from commercial fertilizers. And compost can improve every type of soil – it helps sandy soil retain water and nutrients, and it loosens clay soil promoting stronger root growth.

Composting can:

- Keep plants healthy and resistant to pests and diseases by improving the fertility and structure of your soil – even clay soils!
- Provide food for essential soil organisms that break down organic material and release nutrients for plant growth.
- Save you money by eliminating the need to buy fertilizers or other soil amendments.
- Save you time by reducing the need to bag and haul yard trimmings.
- Save water by adding organic materials to the soil that hold moisture and reduce runoff.
- Reduce solid waste by recycling kitchen scraps and yard waste.
- Protect the environment by eliminating the need for pest control products and chemical fertilizers that can harm people, pets, wildlife, and our local creeks and Bay.

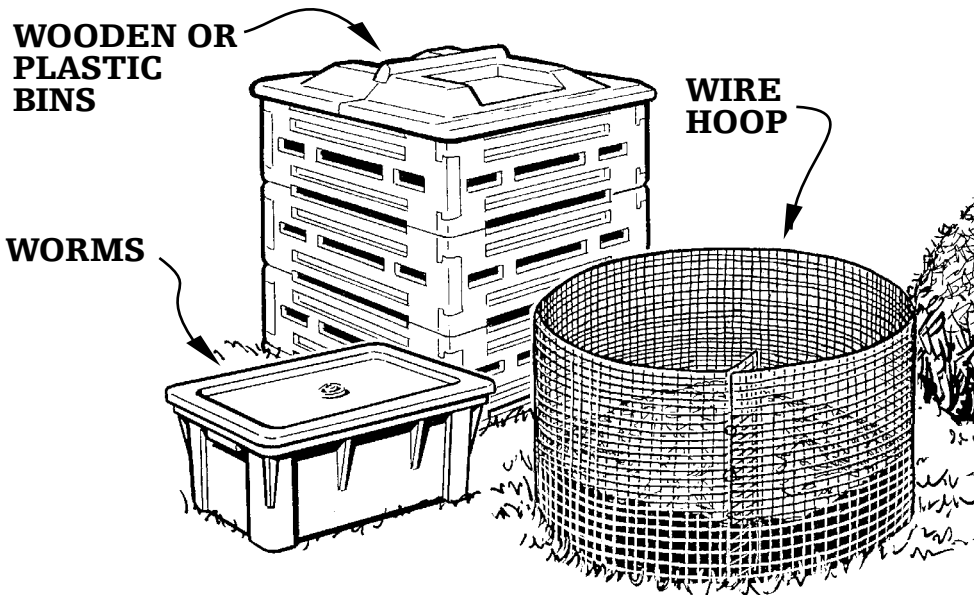
## CHOOSING A COMPOST SYSTEM

There are so many different ways to make compost, that the decision really comes down to choosing the system that is most convenient for you. Before you begin, consider the type and volume of materials you want to compost, how much yard space you have available, and how much time you want to put into maintaining the system. You can create a passive (cold) compost pile by layering organic materials and letting them rot on their own. Or, you can create compost more quickly in an active (hot) pile by turning the compost often and monitoring the moisture levels.

If you want to make compost quickly, you will need to build a pile at least 3' x 3' x 3' (one cubic yard) so that it heats up sufficiently. You can build a smaller pile, it just may take longer for the material to decompose. If you only have a small amount of space, consider the post-hole composting or worm composting techniques described in this booklet. In general, enclosed piles with lids are less attractive to animals, and will hold heat and moisture better. A system that allows you to turn the pile easily will help you to speed up the composting process.

### Here are some common ways to make compost:

**Open Pile:** This inexpensive form of composting takes very little effort to maintain, and works best if you have a large enough area. If not turned, this method will take longer to compost and may be attractive to animals.



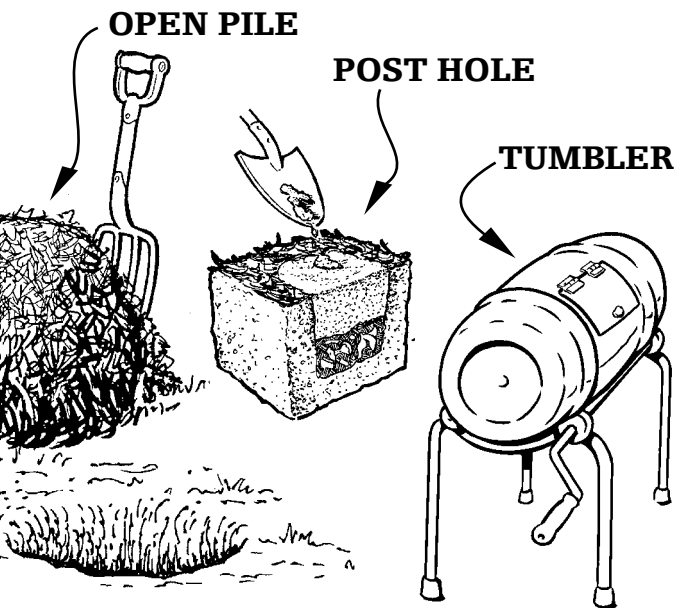
**Wire or Plastic Hoops:** Inexpensive hoops can be made out of wire or plastic. These bins are tidier than open piles and can be moved easily when you want to turn the compost, but they are not animal resistant.

**Tumblers:** Drums or barrels that rotate to mix and aerate the compost can produce compost quickly. Tumblers can fit into small spaces and are animal resistant, but they are more expensive than other systems, need to be turned often, and may be hard to turn when full.

**Wooden or Plastic Bins:** Enclosed bins retain heat well and are animal resistant. Utilizing a multiple bin system will allow you to produce large volumes of compost, and makes it easier to turn compost often. Bins that stack or come apart will make the job of turning the compost much easier. (See the Appendix for ideas on constructing wooden bins.)

**Worm Bins:** Worms can be kept in small plastic or wooden bins that are perfect for small yards or even balconies. Worm bins are usually designed to handle small amounts of food wastes. (See pages 15-19 for instructions on worm composting.)

**Post Hole Composting:** To compost without a pile or bin, you can dig a hole 12" to 18" deep, put in a 3" to 6" layer of food and yard waste, then fill the hole with dirt. Cover the waste with at least 8" of soil. You can plant right on top of the hole without having to harvest the finished compost. This technique requires very little space.



**Building a Compost Bin**  
 For instructions on building some simple compost bins, see the Appendix of this guide.

**Buying a Compost Bin**  
 For information on where to purchase a compost bin, see page 34 of this guide. For additional information, visit [www.marinrecycles.org](http://www.marinrecycles.org)

## CHOOSING A COMPOST SITE

Choose a level site with good drainage. Partial shade is best because too much sun can dry the compost out too quickly, especially in the summer. Pick a site that has easy access to water, is convenient for taking out kitchen wastes, and away from wooden structures, like fences.

## HOW TO MAKE COMPOST

When you create a compost pile, you are really building a 'habitat' for decomposers – the tiny soil organisms that break down organic material and recycle nutrients for new plant growth. Soil microorganisms, like bacteria and fungi, begin the process of decomposition. Then larger organisms, like worms, beetles, mites and millipedes, continue to eat and break down the organic materials.

Bacteria and fungi thrive on a balance of two kinds of foods: carbon-rich, woody “browns” like dry leaves and twigs, and nitrogen-rich, fresh “greens” like grass clippings and food scraps. As the microorganisms digest organic material and reproduce, they give off heat. In fact, the center of a hot compost pile may heat up to 110° to 140°F!

### A Recipe for Success

To make compost, you will need organic materials rich in both carbon and nitrogen. The easiest recipe for making compost is to simply alternate equal amounts of green (nitrogen) and brown (carbon) materials in layers as you build your pile. If you don't have equal amounts of greens and browns, you can still build your pile. Just be sure to carefully monitor the moisture levels so the pile doesn't become too dry or too wet.

Here are the four basic ingredients you need for composting:

1. **Browns:** Dry, carbon-rich, woody materials such as fallen leaves, dried plants, branches, sawdust, and straw. These materials form the bulk of the compost pile.



### A NOTE ON SAVING KITCHEN SCRAPS AND YARD WASTES

*You can store kitchen scraps in a container or bucket with a lid, but don't store them too long. Add them to your compost pile every day or two. During the year, you can save dry brown materials like leaves and wood chips in plastic bags or trash cans. They will be ready to use when you have a supply of green materials.*

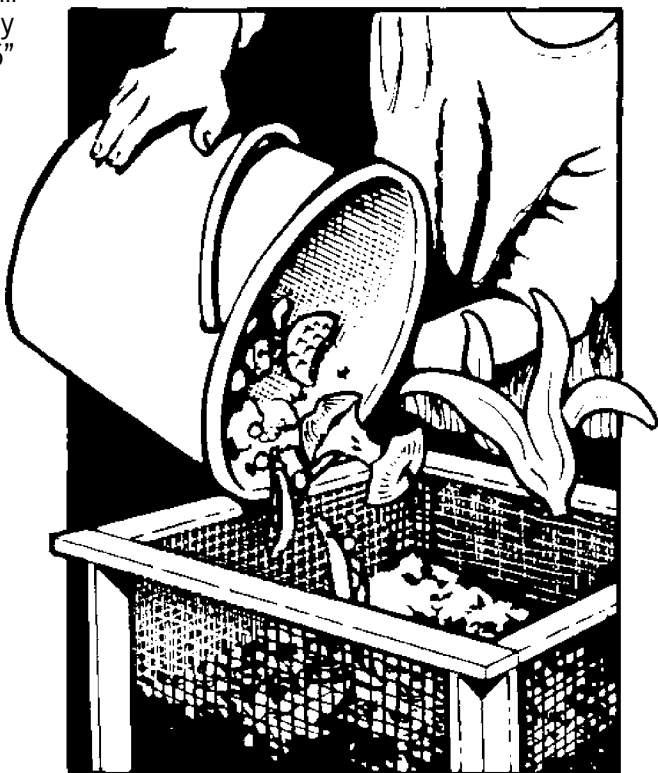


2. **Greens:** Nitrogen rich, moist materials such as kitchen scraps, grass clippings, garden trimmings and manure. These nitrogen rich materials help to heat up the compost pile. Use small amounts of grass-clippings at one time, or mix them together with other organic materials so that they don't mat together.
3. **Water:** Keep your pile moist, but not soaking wet. It should have the consistency of a 'wrung-out sponge.' If the compost pile is too dry or too wet the decomposition process slows or stops. During hot weather, you may need to add water. During the rainy season, you should cover the pile with a tarp.
4. **Air:** Microorganisms, like bacteria, need air to do their work. Turning or fluffing up the compost pile will help keep the material aerated and will speed up the composting process.

## ASSEMBLING A COMPOST PILE

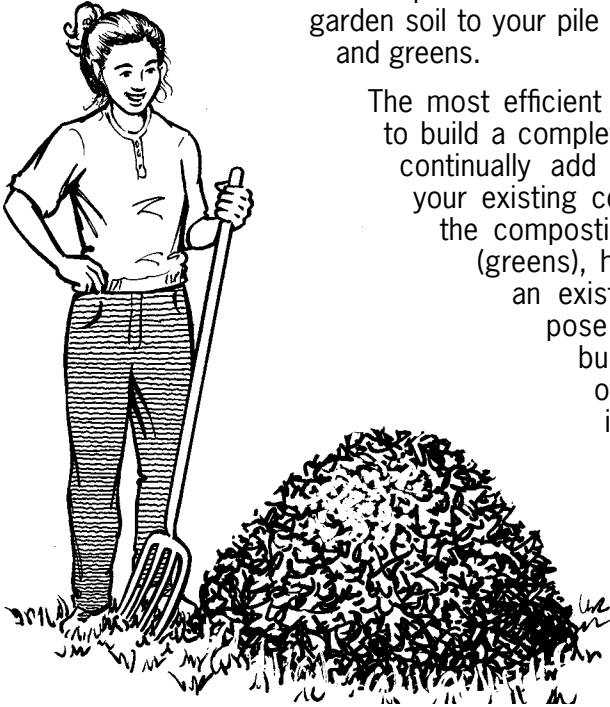
**CHOP:** By shredding or chopping up your organic materials you will expose more surface area for soil organisms to feed on. So the smaller the materials, the faster they will decompose. Cut woody materials into pieces 6" or less. You can run them through a chipper shredder or you can chop them up with a shovel. (You don't need to chop up soft materials like kitchen scraps, green leaves and grass clippings.) You can stack dry leaves and softer yard trimmings in a low pile and run your lawn mower over them.

**LAYER AND MIX:** As you build your compost pile, layer equal amounts of green and brown materials. Start with a layer of coarse,



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brown material like twigs, chopped up branches and woody plant stems. This will provide drainage and ventilation as you build the pile. Alternate equal layers of greens and browns, wetting each layer as you go. End your pile with a layer of browns. Optional: You can 'seed' your compost by adding microorganisms as you build the pile. Simply add a couple of shovels full of finished compost or garden soil to your pile after each layer of browns and greens.



The most efficient way to make compost is to build a complete pile at one time. If you continually add only brown materials to your existing compost, it will slow down the composting process. Food scraps (greens), however, can be added to an existing pile and will decompose fairly quickly. Be sure to bury the scraps in the middle of the pile to avoid attracting rodents and flies.

**MAINTAIN:** Continue to monitor the air and water in your pile. Keep the compost as moist as a wrung-out sponge. Add air by turning the pile frequently or loosening it with a garden fork or compost aeration tool.

This will also help mix the materials so they compost more evenly. The more often you turn the pile, the faster it will compost.

One trick for aerating your compost pile is to use perforated pipe to get air into the middle of the pile. You can use perforated drainage pipes or drill holes into plastic pipes. Insert the pipes into the pile as you build your compost, or push the pipes down into a finished compost pile.

*"The Nation that destroys soil,  
destroys itself."*

*Franklin Delano Roosevelt*

## THE DO'S AND DON'TS OF COMPOSTING

Compost can be made from much more than just kitchen scraps and yard trimmings. Using a variety of organic materials will keep these valuable resources out of our landfills and returns them to nature's nutrient cycle.

DO COMPOST	DON'T COMPOST
<p><b>Greens</b></p> <ul style="list-style-type: none"> <li>• Fruit and vegetable scraps</li> <li>• Coffee grounds &amp; tea bags</li> <li>• Egg shells</li> <li>• Fresh yard trimmings</li> <li>• Lawn clippings</li> <li>• Manure from non-meat eating animals</li> <li>• Young weeds (no seeds)</li> <li>• houseplants</li> </ul> <p><b>Browns</b></p> <ul style="list-style-type: none"> <li>• Dry leaves</li> <li>• Chopped, woody prunings</li> <li>• Pine needles (small amounts)</li> <li>• Untreated wood sawdust</li> <li>• Shredded paper towels, tissues, cardboard and newspaper</li> </ul>	<ul style="list-style-type: none"> <li>• meat, bones or fish</li> <li>• dairy products</li> <li>• fatty or greasy foods</li> <li>• diseased or insect-infested plant material</li> <li>• persistent weeds like poison oak, Bermuda grass or ivy</li> <li>• dog, cat or bird feces</li> <li>• wood sawdust from treated or painted woods</li> <li>• wood ashes or ashes from a BBQ</li> <li>• weeds that have gone to seed</li> <li>• glossy, coated or heavily colored paper</li> </ul>

## HOW LONG DOES IT TAKE TO MAKE COMPOST?

The rate at which organic materials break down is affected by the amount of water and air in the pile, and the carbon to nitrogen ratio. To speed up the composting process, chop up the materials, turn the compost often and keep the pile moist. Turning your pile weekly might produce finished compost in 1 to 2 months, while turning the pile monthly could take 4 to 6 months or longer. If you build an open pile and just let it sit, it might take from 6 months to a year to decompose.

### DID YOU KNOW:

*In nature it may take more than 1,000 years to create 1" of topsoil!*

## How To Tell When Compost is Finished

Finished compost is a dark, crumbly material with a sweet, earthy aroma. You will no longer be able to recognize the original materials, and the compost pile will cool down. If there are any large chunks of woody material or food scraps left, you can screen them out and add them to a new pile, or use large wood chips as a mulch (see page 25).

## PUTTING COMPOST TO WORK

You can use your compost in a variety of ways:

- *As a Soil Amendment:* Work a 2" to 4" layer of compost into the top of your soil before planting or around already established plants. When you are adding new plants, mix 1 part compost to 2 to 3 parts soil to fill in the hole around new plants.
- *As a Mulch:* Spread a 1" to 3" thick layer of compost over the soil around plants, leaving space around the stems of plants.
- *On Lawns:* Spread a ¼" to ½" layer of finely screened compost on your lawn in the fall or spring. (Don't cover or bury the grass.) Lightly rake in and water well. Using a spreader will make the job easier, but you can also use a shovel.
- *For Houseplants and Container Plants:* Spread a thin layer on the top of the soil, or add some compost to commercial potting soils when planting in containers.

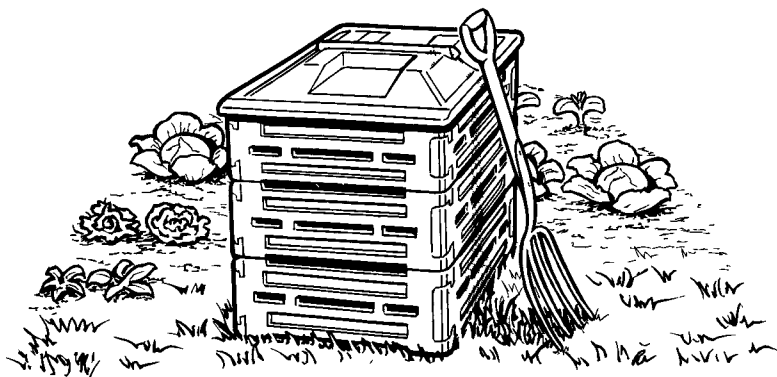


### REMEMBER:

*For a garden that is safer for people, pets and the environment, avoid the use of toxic chemicals. If a chemical is needed as a last resort, use the least toxic product available. For a list of products that are less toxic than conventional pesticides and herbicides, go to [www.ourwaterourworld.org](http://www.ourwaterourworld.org)*

## COMPOST TROUBLESHOOTING GUIDE

SYMPTOM	PROBLEM	SOLUTION
Pile smells bad	Too wet or not enough air	Turn pile & add dry, brown materials
Pile not composting or heating up	<p>Too dry</p> <p>Too much dry, carbon-rich material</p> <p>Pile size too small</p>	<p>Add water</p> <p>Turn and add fresh nitrogen-rich greens: fruit &amp; vegetable scraps, grass clipping, manure</p> <p>Build pile up to 3' x 3' x 3'</p>
Pile attracts rodents or flies	Non-compostable materials present or food wastes exposed	Remove bones, meat, fatty foods; bury food wastes in middle of pile; use a rodent-proof-bin
Pile attracts ants	<p>Too dry</p> <p>Exposed food scraps</p>	<p>Add water</p> <p>Keep food scraps buried</p>



## BREWING UP SOME COMPOST TEA

Compost tea is a liquid plant food made by steeping compost or worm castings in water. The tea can be watered into the soil or sprayed on leaves. Compost tea is teeming with the microorganisms that help to feed plants. There is even research showing that, when used as a foliar spray, the microorganisms in the tea can help to suppress plant diseases and repel pests.



Some of the most nutrient-rich compost tea is made from worm castings. If you have a worm bin, you can make a **small amount** of compost tea by using the liquid that accumulates on the bottom of the bin. Dilute this 'compost tea' until it is the color of weak tea and apply it to soil or leaves. Use this solution as soon as possible.

To brew a **large amount** of compost tea, you will need to use a system with an aerator. Keeping the air circulating through the solution increases the number of beneficial microbes, keeps nutrients from being lost to the air, and will ensure that the right kinds of microbes are multiplying.

There are several companies that manufacture systems for home brewing, or you can build your own system. Below are some resources for more information on purchasing or building your own compost tea brewing system.

### Information on Compost Tea

Compost Tea, CalRecycle: <http://www.calrecycle.ca.gov/Organics/CompostMulch/CompostTea/default.htm>

"Brewing Compost Tea" by Elaine Ingham:  
<http://www.finegardening.com/how-to/articles/brewing-compost-tea.aspx>

Purchasing Brewing Systems:  
Growing Solutions: [www.growingsolutions.com](http://www.growingsolutions.com)

SoilSoup:  
[www.soilsoup.com](http://www.soilsoup.com)

Keep It Simple, Inc.:  
[http://www.simplici-tea.com/what\\_is\\_compost\\_tea.htm](http://www.simplici-tea.com/what_is_compost_tea.htm)

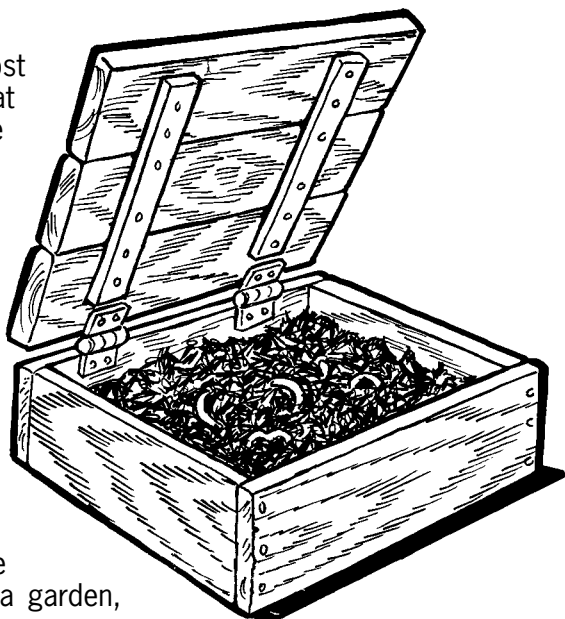
Sustainable Agricultural Technologies, Inc.:  
<http://www.composttea.com/>

# COMPOSTING WITH WORMS

## NATURE'S HARDWORKING RECYCLERS

Worms are one of nature's most important recyclers. As they eat organic materials worms leave behind droppings (called castings) that provide a nutrient-rich fertilizer for plants. Worm composting, also called vermiculture, is simple, low-cost and can be done year-round.

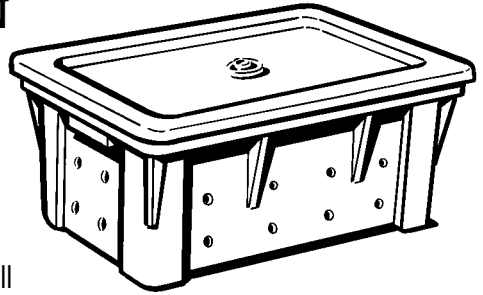
Your worm bin will require very little attention once it is set up. These bins are odorless and don't require much space, so you can keep your worm bin in the house, garage, or outside in a garden, patio or balcony.



Red wigglers, sometimes called red worms or manure worms, are the best choice for worm bins. These worms are surface feeders that can tolerate a wide range of temperatures, and they multiply quickly. In fact, eight adult red worms can produce 1500 offspring in only 6 months! Extra worms can be released into your garden or near your compost pile. Worms are efficient decomposers: one pound of red wigglers can eat about 65 pounds of food scraps in 3 to 4 months.

## MAKING A WORM BIN

To set up a worm bin, you will need worms, a bin, bedding material and food. Each is explained below. On the next page you'll learn how to assemble your bin.



### WORMS

One-half or one pound of worms will be a good start for your bin. You can find red wigglers (*Eisenia foetida*) at bait shops or order them from commercial worm farmers. (For where to buy red wigglers, see page 35 of this guide.) Do not use earthworms that can be found in your garden – they require cooler temperatures and prefer very deep tunnels.

### A WORM BIN

Choose a sturdy container with a tight fitting lid at least 12" to 16" deep. A 10 to 14 gallon opaque (not clear) plastic storage bin works well, or you can construct a wooden box or purchase a commercially designed worm bin. Ventilation is crucial, so drill plenty of air holes. (For directions on making a worm bin, see page 41 of this guide.)

### BEDDING MATERIAL

Bedding material provides shelter and food for the worms, and covers the food scraps to keep out flies. The easiest material to use is newspaper torn into 1" strips lengthwise (or use paper from your personal document shredder). Don't use glossy or coated paper. You can also use leaves, straw or coconut fiber. Wet the bedding material and wring it out. It should feel as moist as a wrung-out sponge.

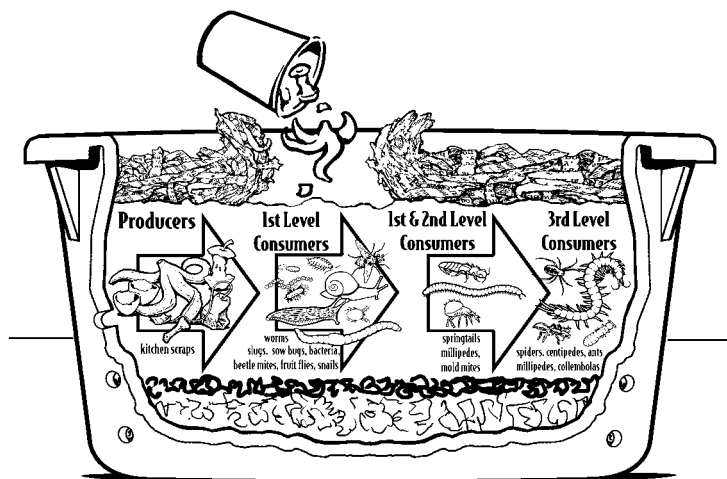
### FOOD

Red wigglers will eat a variety of organic materials. You can use fruit and vegetable scraps, coffee grounds, tea bags, crushed eggshells, leaves, grass clippings and yard waste. DO NOT feed them meat, dairy products, greasy or oily foods. These are harder for worms to digest and can attract other animals.

Cut large food items up into small pieces and don't use too many highly acidic foods (like citrus peels and tomatoes) at one time. Too much acidity can attract other critters and make the bin smell unpleasant. When you add food to the bin, be sure to cover it with several inches of the bedding material so that it does not attract flies.

## CARING FOR YOUR WORMS

- Moisture: check the worm box weekly to make sure the bedding stays moist.
- Food: Add more food only when worms have just about finished eating what is already there. Don't overfeed your worms, as too much extra food can attract pests to the bin. Add a handful of garden soil occasionally for grit.
- Bedding: The worms will gradually eat the shredded newspaper, so add more bedding as needed. Try to keep the worms and their food well covered with a layer of bedding.



### ASSEMBLING YOUR WORM BIN

- Fill your worm bin with moist, fluffed-up newspaper strips.
- Mix in one or two big handfuls of garden soil. This supplies worms with the grit they need to digest food and provides bacteria to help speed the composting process.
- Gently add the worms, covering them with the newspaper.
- Add one or two handfuls of food scraps. Be sure to keep food covered with newspaper to keep flies out of your bin.
- Cover the bin and set it in a sheltered spot out of direct sunlight where it is protected from rains and freezing. Don't feed the worms again until their food is almost gone.

## USING WORM CASTINGS AS FERTILIZER

The Marin County Department of Parks and Open Space uses **worm compost** in the atrium of the Civic Center to improve soil conditions for enhanced plant growth and to reduce the need for synthetic fertilizers!

Eventually your worm bin will be full of a rich, dark, crumbly soil-like material. These castings are a highly concentrated fertilizer. You can dig the castings into garden beds or use them as a topdressing by sprinkling castings on top of the soil. You can also mix a small amount into potting soil (no more than 20% castings), or use the castings to make compost tea. (See page 14 for more information.) Don't worry if there are some worms in the castings you use on your plants – the worms will do fine in the garden or in planted containers.

Here are some easy ways to harvest worm castings:

- Move all the bedding and castings to one side of the bin. Put fresh bedding and food into the empty side of the bin. Once worms have moved to the side with the food, you can harvest the old side.
- Dump the worm bin out onto a tarp in the sunlight. As the worms crawl into the middle of the pile you can remove the casting around the edges until you are left with the worms in a small pile in the middle. Put them back into the bin with fresh bedding.
- Cut some screen slightly larger than the worm bin and set it on top of the castings. Put fresh bedding and food on top of the screen. The worms will migrate up through the screen and you will be able to lift off the screen and harvest the casting below.

### **DID YOU KNOW:**

*In one acre of soil there may be a million worms, eating 10 tons of organic matter and turning over 40 tons of soil!*

## WORM BIN TROUBLESHOOTING GUIDE

You may find other creatures in your worm bin, like ants, fruit flies, sowbugs, slugs and potworms (tiny white worms that look like newborn redworms). Don't worry. They are harmless, and many of these critters help to break down food scraps making them easier for worms to digest.

SYMPTOM	PROBLEM	SOLUTION
Worms are dying	Too dry Too wet Too hot  Too many castings	Moisten bedding Add dry bedding Put bin in shade; move bin to cooler location Harvest castings; add fresh bedding
Bin has a rotten odor	Poor air circulation  Too much food	Fluff up contents; add fresh bedding  Remove excess food; add fresh bedding
Fruit flies in bin	Food is exposed	Cover food with bedding; cover bin
Ants in bin	Too much food	Remove excess food, add bedding; elevate the bin and set it over soapy water.
Worms are crawling out of the bin	Too much food Bedding too wet Too many castings or worms	Reduce food scraps Add dry bedding Harvest castings; start another worm bin

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# MULCHING

## PROTECTING SOIL NATURALLY

Mulch is a protective layer of material laid on the surface of the soil. In nature, plants automatically mulch soil as they drop their leaves, twigs, flowers and fruit. Gardeners can copy this process of recycling nutrients and protecting the soil by mulching with yard wastes. Mulching your garden is a simple yet powerful way to improve your soil, conserve water and recycle yard waste.

### THE DIFFERENCE BETWEEN COMPOST AND MULCH

A mulch is a material used to cover the top of the soil to suppress weeds and reduce evaporation and erosion. There are a wide variety of materials that can be used including leaves, grass clippings and rocks. Compost is a nutrient-rich soil amendment most often used as a fertilizer. Compost can also be used as a mulch, but it isn't as effective a weed barrier as other materials since weed seeds landing on the compost will have a wonderful place to grow.



### WHY MULCH

Mulching can:

- *Reduce weeds* by keeping them from sprouting and growing.
- *Add essential nutrients to the soil* and provide food for important soil organisms like earthworms.
- *Protect the soil* by improving soil structure, reducing compaction and erosion, and by keeping soil cooler in summer and warmer in winter.
- *Save water* by reducing evaporation.
- *Save time and money* by reducing the need for watering, fertilizing, weeding and raking.
- *Enhance the appearance of your garden* by giving your landscape a 'finished' look
- *Keep plants healthy* without using pesticides, herbicides and other toxic chemicals.

### SOME GENERAL GUIDELINES FOR MULCHING

- For mulches with small particles, like compost, mulch 1" to 3" deep. For coarser materials, like small wood chips, mulch 2½" to 4" deep.
- Finer mulches are best for retaining moisture, and coarser mulches are better for weed control.
- Before you mulch, weed the area and water thoroughly.
- Do not mulch right up to the stems of plants – leave several inches of space to prevent diseases caused by too much moisture.
- You might be able to get free mulch by calling one of the tree services listed on page 35 under "Finding Mulch."



## **CALCULATING HOW MUCH MULCH YOU NEED**

Mulch is usually sold by the cubic yard. One cubic foot of mulch will cover 12 square feet 1" deep. One cubic yard will cover 324 square feet 1" deep. Here are some additional guidelines to help you figure out the amount of mulch you will need.

1. Determine the number of square feet you want to mulch. To do this, multiply the length of the area by the width.
2. Determine how many inches of mulch you want to put on the area. Two to four inches will work well for most types of mulch.
3. Multiply the size of your area in square feet by the depth of your mulch in inches.
4. Divide this amount by 324 to get the number of cubic yards of mulch you will need.

## CHOOSING A MULCH

Mulch may be organic materials like compost, wood chips and leaves, or inorganic materials like rocks and gravel. Both types of materials will suppress weeds, but organic mulches will also provide food for soil organisms and hold moisture in the soil.

Soft materials like compost, grass clippings and leaves decompose quickly, so they are good choices for flower and vegetable beds.

Woody, fibrous or hard materials such as wood chips, pine needles and gravel decompose slowly and are good for pathways.

In choosing a mulch, keep in mind that each type of mulch will decompose at a different rate and will influence how fast water drains in the garden. For example, large wood chips are a good choice for a pathway because they allow water to drain off quickly and are slow to decompose.

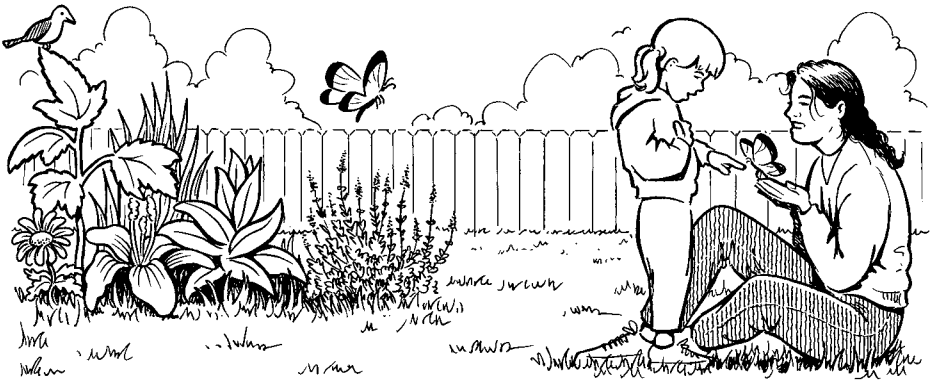


Here are just a few different materials that may be used as mulch:

<b>ORGANIC MULCHES</b>	<b>USING THE MULCH</b>
Grass Clippings	Leave grass clippings on the lawn when you mow; use as a mulch on flower and vegetable beds; mix grass clippings with other organic materials so they do not mat.
Newspaper and Cardboard	Lay several sheets of newspaper, or 1 to 2 layers of cardboard under other mulches to help control weeds; avoid using glossy, colored or coated paper.
Compost	Use a 1" to 3" layer of compost around plantings; best used underneath another layer of mulch, such as wood chips, to prevent weeds.
Leaves and Yard Prunings	Use a 2" to 4" layer around plantings; chop leaves with a lawn mower or shredder to reduce matting.
Wood Chips	Use a 2" to 4" layer of small chips around plantings; larger chips work well on pathways.
Sawdust and Woodshavings	Use a 1" to 2" layer around plantings; avoid using treated or painted wood.
Straw	Use a 2" to 6" layer around plantings; do not use hay which may contain weed seeds.
Pine needles	Use a 2" layer around acid-loving trees and shrubs, or use on pathways.

## 26) GROWING GARDENS FROM GARBAGE \*\*\*\*

<b>INORGANIC MULCHES</b>	<b>USING THE MULCH</b>
Stones and Gravel	Use a 1" to 2" layer around plantings; stones will heat up in the sun and can create a hot landscape environment. Stones and gravel are also good to use on patios or driveways to create pervious surfaces that absorb rainwater. For more information, go to <a href="http://www.mcstoppp.org">www.mcstoppp.org</a> under Resources: New Development/Construction.
Landscape Fabric	Can be used under other mulches to block weeds.
Plastic	Best used under a mulch for pathways; some plastics hold in heat and kill weed seeds but can also harm soil micro-organisms.



## MIRACULOUS SHEET MULCHING

Sheet mulching is a technique that can be used around existing plantings or in establishing a new garden site. If you have a hard-pan, clay or open area in your garden that you want to plant, sheet mulching can save you a lot of work. By covering the area with organic materials and leaving it for a few months, you let the soil microorganisms and the natural process of decomposition do the work of preparing the soil for you.

To prepare the area:

1. Cut down weeds. If the weeds have not gone to seed, you can leave them right on top of the soil to add nutrients, but remove any large, woody materials. Water the area thoroughly.
2. Create an organic weed barrier by covering the area with several layers of newspaper. It's important to overlap each section of newspaper so the soil is not exposed. You can also use cardboard, which will take slightly longer to break down. Wet the newspaper or cardboard well with a hose. If you are mulching around existing plants, keep the mulch at least 2" to 4" away from the plant stems.

If you want, before you lay down the weed barrier, you can cover the area with several inches of organic material, like compost, leaves or manure. Wet the area thoroughly.

3. Cover the newspaper or cardboard with some type of organic mulch, like woodchips or straw, 2" to 4" deep. This will keep the wind from blowing away the paper and will make the area look more attractive. (Avoid using hay, which often contains weed seeds.)

4. Water occasionally to keep the area from drying out.

You can plant right into the sheet mulch. Just use a shovel to 'punch' a hole through the newspaper and set your plants into the hole.

You can also plant a cover crop, such as vetch, clover or fava beans right on top. This not only speeds up the process, it will add further nutrients to the soil.

### **DID YOU KNOW:**

*Every year 3 billion tons of topsoil erodes into U.S. waterways! To protect topsoil, use mulch!*

# 28) GROWING GARDENS FROM GARBAGE \*\*\*\*

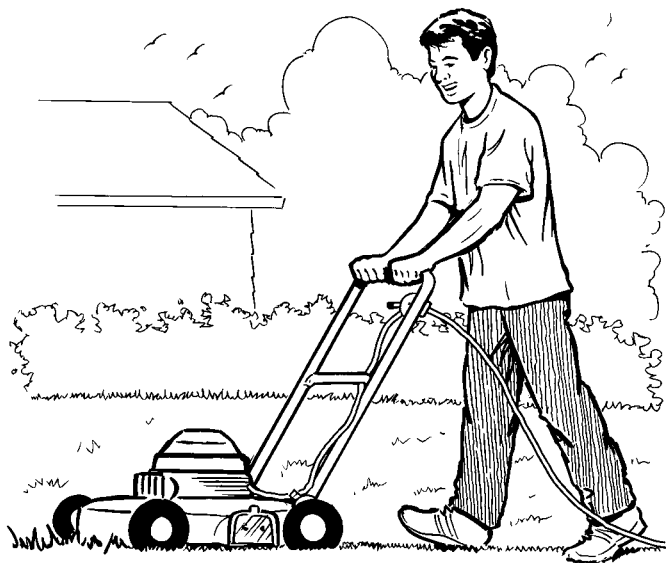
# G RASSCYCLING

## FEED YOUR LAWN— NOT THE LANDFILL!

Grasscycling is a natural way of recycling grass clippings by leaving them on your lawn when you mow.

### WHY GRASSCYCLE

- *Grasscycling creates healthier lawns* by returning valuable nutrients to the soil.
- *Grasscycling benefits the environment* by keeping this valuable resource out of the landfills. A half-acre of lawn can produce 4½ tons of clippings in one season!
- *Grasscycling saves you money* by reducing the need for fertilizer.
- *Grasscycling saves you time* by eliminating the need to rake up clippings.



## HOW TO GRASSCYCLE

The key to grasscycling is to cut grass at the recommended height.

- Mow your lawn when the grass is dry and the blades are no more than 3" to 4" tall.
- Keep your mower blade sharp.
- Cut off *only the top*  $\frac{1}{3}$  of the grass blade.
- Leave the clippings on your lawn.

Any lawnmower can be used to grasscycle by adjusting the cutting height and by removing the collection bag so that clippings drop onto the lawn.

Many manufacturers now sell attachments to retrofit conventional mowers so that you can grasscycle more efficiently. You can also purchase mulching lawnmowers, which are designed to cut lawn clippings into very small pieces that decompose quickly.

During the growing season, you may need to mow once a week. If you have excess grass clippings, you can use them in your compost.

## GETTING THE FACTS STRAIGHT

- Grasscycling does not cause thatch. Thatch is created by a build up of grass stems, roots and shoots that cover the surface of the soil. Grass clippings decompose very quickly and will not cause a thatch build-up on your lawn. Improper watering, compacted soil and the overuse of fertilizers can cause thatch.
- Grasscycling will not spread lawn diseases. Diseases are primarily spread by improper watering and fertilizing.
- Grasscycling will not create a messy looking lawn: Small grass clippings will decompose very rapidly, and the nutrients they provide will keep your lawn healthy and green.

### **DID YOU KNOW:**

*Grass clippings are 85% water and 5% nitrogen! Left on your lawn these clippings can conserve water and provide 30% of your lawn's yearly fertilizer needs.*

## RECOMMENDED MOWING HEIGHTS

GRASS TYPE	MOWER SETTING	MOW WHEN GRASS REACHES THIS HEIGHT
Bentgrass	½"–1"	¾" – 1½"
Bermuda (common)	1" – 1½"	1½" – 2¼"
Bermuda (hybrid)	½" to 1"	¾" – 1½"
Kentucky Bluegrass	1½" – 2½"	2¼"–3¾"
Kikuyugrass	1"–1½"	1½" – 2¼"
Perennial Ryegrass	1½" – 2½"	2¼"–3¼"
Tall Fescue	1½" – 3"	2¼" – 4¼"
St. Augustine	1" – 2"	1½" – 3"

*This chart was developed by the California Integrated Waste Management Board (800) 553-2962*

For additional tips on maintaining your lawn, see the brochure *Tips For a Healthy Beautiful Lawn*, one of many fact sheets available on-line at: [www.ourwaterourworld.org](http://www.ourwaterourworld.org). You can also request a copy by calling Marin County Stormwater Pollution Prevention Program at (415) 499-6528.



# RESOURCES

## WEBSITES

- **Bay-Friendly Gardening Guide**  
<http://www.stopwaste.org/home/index.asp?page=482>
- **Bay-Friendly Landscaping Guide to Mulch**  
<http://www.stopwaste.org/docs/mulchguide-2006.pdf>
- **Bay-Friendly Landscaping Guide to Grasscycling**  
<http://www.stopwaste.org/docs/bfgrasscycling-2006.pdf>
- **CalRecycle**  
[www.calrecycle.ca.gov/organics/HomeCompost](http://www.calrecycle.ca.gov/organics/HomeCompost)  
 (916) 341-6000
- **Marin Master Gardeners**  
 (415) 499-4204  
 1682 Novato Blvd., Suite 150B  
 Novato, CA 94947  
<http://cemarín.ucdavis.edu>
- **How to Compost**  
[www.howtocompost.org](http://www.howtocompost.org)
- **Worm Digest**  
[www.wormdigest.org](http://www.wormdigest.org)

## RECYCLING AND DISPOSAL

- **Marin Hazardous and Solid Waste Joint Powers Authority**  
[www.marinrecycles.org](http://www.marinrecycles.org)  
 (415) 499-6647
- **Household Hazardous Waste Collection Facilities**  
 Novato: (415) 892-7344  
 All other areas in Marin:  
 (415) 485-6806

## LESS-TOXIC PEST CONTROL

- **Our Water Our World**  
[www.OurWaterOurWorld.org](http://www.OurWaterOurWorld.org)
- **Marin Beyond Pesticides**  
[www.pesticidefreezone.org](http://www.pesticidefreezone.org)  
 1-888-590-3993
- **Beyond Pesticides**  
[www.beyondpesticides.org](http://www.beyondpesticides.org)
- **Bio-Integral Resource Center**  
[www.birc.org](http://www.birc.org)

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- **Environmental Working Group**  
www.ewg.org
- **Northwest Coalition for Alternatives to Pesticides**  
www.pesticide.org
- **Pesticide Action Network**  
www.panna.org
- **Hungry Owl Project**  
www.hungryowl.org
- **Water Wise Gardening CD**  
Plant library, design ideas, composting and mulching ideas:  
available free of charge from the Marin Municipal Water District at (415) 945-1520. (May be limited to their customers.)
- **The Worm Book**, Loren Nancarrow, Janet Hogan  
Taylor, Ten Speed Press, 1998.

## BOOKS, ARTICLES AND CDS

- **Basic Composting: All the Skills and Tools You Need to Get Started**, Erich Ebeling, Stackpole Books, 2003.
- **Easy Composters You Can Build**, Nick Noyes, Storey Publishing, 1995.
- **Let it Rot! The Gardener's Guide to Composting**, Stu Campbell, Storey Publishing, 1998.
- **The Mulch Book**, Stu Campbell, Storey Publishing, 1991.
- **The Rodale Book of Composting: Easy Methods for Every Gardener**, Grace Gershuny, Rodale Books, 1992.
- **Start with the Soil**, Grace Gershuny, Rodale Books, 1993.
- **Soil Matters**, a reprint from Bay Nature magazine available by calling MCSTOPPP at (415) 499-6528.
- **Worms Eat My Garbage: How to Set Up & Maintain a Worm Composting System**, Mary Appelhof, Flower Press, 1997.

## BUYING BULK COMPOST AND/OR MULCH

- **American Soil Products**  
A & S Landscape Materials  
565 A Jacoby Street  
San Rafael, CA 94901  
(415) 456-1381 or  
www.americansoilans.com
- **Grab n' Grow Soil Products**  
2759 Llano Road  
Santa Rosa, CA 95407  
(707) 575-7275
- **Mallard Mulch**  
Sonoma Compost, <http://www.sonomacompost.com/product.shtml>
- **Martin Brothers Supply**  
232 Shoreline Highway  
Mill Valley, CA 94941  
(415) 388-2025

- **Sonoma Compost**  
550 Meachem Road  
Petaluma, CA 94952  
(707) 664-9113, <http://www.sonomacompost.com/>
- **Mango Mulch**  
Green Point Nursery, Novato  
415-892-2442

## BUYING COMPOST BINS

- **Orchard Supply Hardware**  
1151 Anderson Drive  
San Rafael  
(415) 453-7288
- **Harmony Farm Supply and Nursery**  
3244 Hwy 116 North  
Sebastopol  
(707) 823-1734

## Mail Order:

- **Composters.com**  
[www.composters.com](http://www.composters.com)  
(800) 233-8438
- **Gardener's Supply**  
[www.gardeners.com](http://www.gardeners.com)  
(800) 427-3363
- **Peaceful Valley Farm Supply**  
[www.groworganic.com](http://www.groworganic.com)  
(888) 784-1722
- **Smith and Hawken**  
[www.smithandhawken.com](http://www.smithandhawken.com)  
(800) 940-1170

## FINDING WORMS

- **Western Sports Shop**  
902 3rd Street, San Rafael  
(415) 456-5454
- **Sonoma Valley Worm Farm**  
Sonoma (800) 447-699
- **City Worms and Compost**  
San Francisco  
(415) 759-6907
- **The Worm Farm, Durham**  
(530) 894-1276

## FINDING FREE MULCH

Many tree care companies will provide you with free mulch. Usually this material will contain some leaves and twigs along with wood chips. You can call these local companies and ask to be put on their chip request lists. They will let you know when they are working in your area and can deliver a load.

- **Bartlett Tree Experts**  
(415) 472-4300  
400 Smith Ranch Road  
San Rafael
- **Guastucci Tree Service**  
(415) 456-4443  
30 Creek Road, Fairfax
- **Treemaster/Tamalpais Tree Service**  
(415) 491-1009  
P.O. Box 9350, San Rafael

## **SOURCES OF RECYCLED CARDBOARD FOR SHEET MULCHING**

- **Monahan Paper**  
Oakland: (510) 835-4670
- **North Bay Paper**  
Petaluma: call to order  
(800) 734-2772  
[www.northbaypaper.com](http://www.northbaypaper.com)

## **FINDING MANURE**

Animal manure is a rich source of nitrogen, which feeds soil microorganisms and helps the compost pile heat up. Here are some local stables where you can pick up free manure. Call ahead to make arrangements.

- **Dickson Ranch**  
(415) 488-0454  
182 San Geranimo Valley Dr.  
Woodacre
- **Five Brooks Stables**  
(415) 663-1570  
8001 State Route No. 1  
Olema
- **Miwok Livery**  
(415) 383-8048  
701 Tennessee Valley Road  
Mill Valley
- **Winfield Station**  
(415) 662-2232  
3431 Nicasio Valley Road  
Nicasio

# A PPENDIX

## A GARDENER'S GLOSSARY

**Aerobic:** “with oxygen” – many decomposers require oxygen to live and break down organic materials.

**Amendment:** a material added to the soil to improve growing conditions.

**Anaerobic:** “without oxygen” – without enough air, organisms that live in the absence of oxygen can multiply in a compost pile and produce unpleasant odors.

**Bacteria:** microscopic, one-celled organisms that work as decomposers; they help to break down organic material and recycle nutrients.

**Biodegradable:** a material that can be broken down into smaller components by decomposition or digestion.

**Carbon:** a chemical element in organic materials that provides microorganisms with energy; brown, dry, woody organic materials, like straw and wood chips, are high in carbon.

**Compost:** the process of, or end result of, organisms eating and transforming organic materials into a rich soil amendment called humus.

**Compost Tea:** a liquid fertilizer made by steeping compost in water.

**Decompose:** to rot, decay, or break down into smaller components.

**Decomposers:** organisms that feed on dead organic material, breaking it down and turning it into humus.

## 38) GROWING GARDENS FROM GARBAGE \*\*\*\*

**Grasscycling:** A natural way to recycling grass clippings by leaving them on your lawn when you mow.

**Green Waste:** Yard and garden waste (leaves, grass clippings, branches, etc.) that can be used as compost or mulch in the garden.

**Humus:** the nutrient-rich organic material in soil formed from the decomposition of organic materials.

**Integrated Pest Management (IPM):** an environmentally-friendly approach to pest management that uses a combination of strategies to keep pest damage to an acceptable level. The focus is on preventing pest problems through monitoring and healthy gardening techniques, and using chemicals only as a last resort.

**Microorganisms:** organisms too small to be seen without magnification, such as bacteria.

**Mulch:** material spread on top of garden soil to hold water, stop erosion and weeds, and add nutrients to the soil.

**Nitrogen:** a chemical element that helps microorganisms build their bodies; green or moist organic materials, like grass clippings and food scraps, are high in nitrogen.

**Nutrient:** a substance that provides a source of energy for the growth and repair of living things.

**Organic:** any material that was once living, or material produced by living organisms.

**Topdressing:** to cover the surface of the soil with a loose material, such as compost.

**Vermicomposting or Vermiculture:** composting using earthworms.

**Worm Castings:** nutrient rich droppings of worms that provides a rich soil amendment.

## BUILDING SIMPLE COMPOST BINS

### WIRE HOOP COMPOSTER

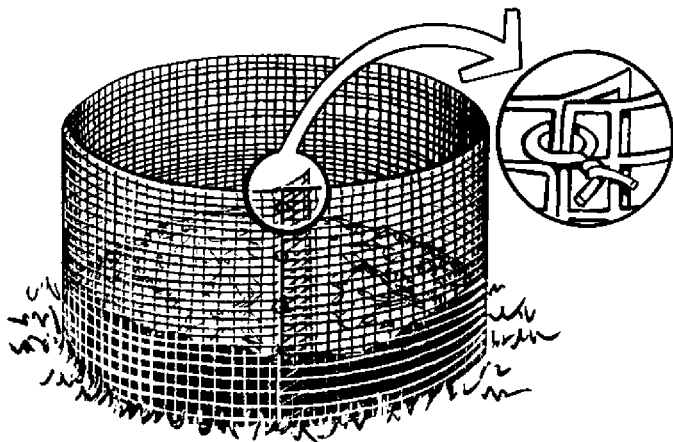
This composting bin is easy to construct, will hold large amounts of materials, and is easily moved when you need to turn your pile.

#### MATERIALS AND TOOLS

- One 13 foot length of ½" hardware cloth (36" wide)
- Baling or heavy wire
- Tin snips, pliers, gloves, safety goggles

#### DIRECTIONS

- Wear gloves and goggles for protection.
- Unroll the hardware cloth and use the tin snips to cut off any sharp points on the ends of the cloth.
- Join both ends together to form a hoop. Secure the ends with baling wire and pliers.
- Stand the hoop up and place it in your composting area.

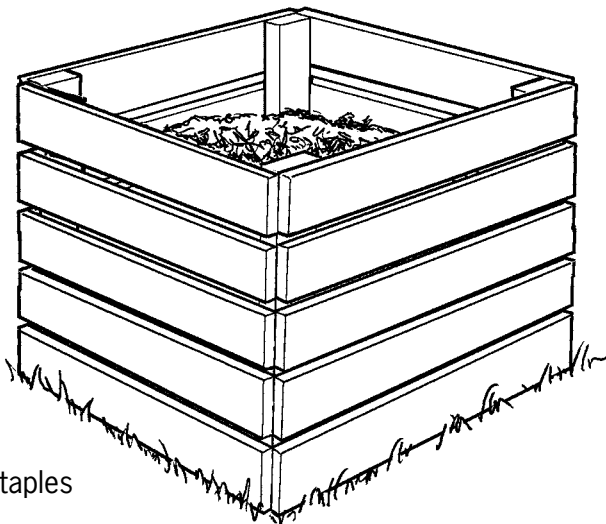


## WOOD PALLET BIN

This simple bin is made from wooden pallets and can handle wastes from small to medium-size yards and gardens. Call local business to locate free pallets.

### MATERIALS AND TOOLS

- 4 wooden pallets
- 2 eight-foot 2 x 4s
- saw, claw hammer, tin snips, gloves, goggles
- 1 lb of galvanized #8d nails
- 16 feet ½" hardware cloth (36" width)
- ¼ lb of poultry wire staples



### DIRECTIONS

- Wear gloves and goggles for protection.
- Using the tin snips, cut the hardware cloth into four 36" x 48" pieces.
- Nail or staple one piece of the hardware cloth to one flat side of each pallet. These sides will face inward and contain the composting material.
- Cut the eight-foot lengths of 2 x 4s in half. Use each length as a corner joint piece. Secure the wood pallets together by nailing them to the joint pieces.

## **BUILDING A SIMPLE WORM BIN**

### **PLASTIC WORM BIN**

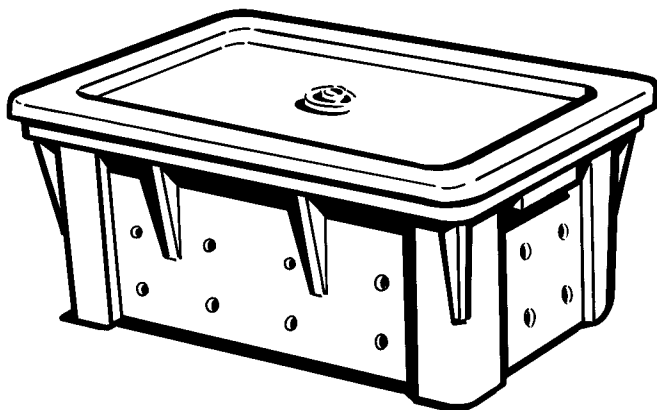
Plastic storage containers make great worm bins. They are inexpensive, easy to move around, and will hold moisture well.

#### **MATERIALS AND TOOLS**

- 1 plastic storage container with a tight-fitting lid (10 to 14 gallon capacity). Container should be opaque – not clear.
- Power drill with ¼" bit

#### **DIRECTIONS**

- Drill several holes for ventilation around the sides of the bin and in the lid.
- If you are keeping the bin outside, you might want to drill holes in the bottom of the bin to let excess water drain out.



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# NOTES



*February 2010*

