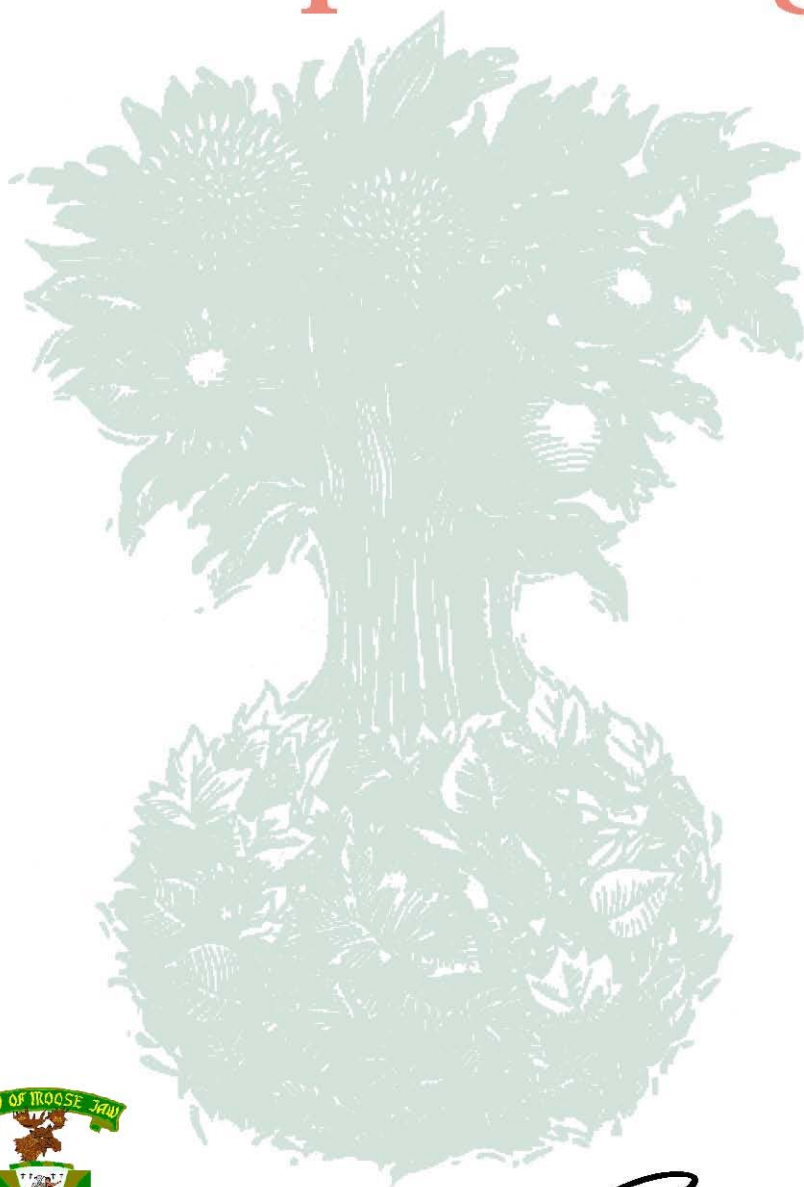












# Your Guide to Composting



**The City of Moose Jaw would like to thank the City of Regina for providing the information to develop this document.  
For more information on composting please call the the City of Moose Jaw Engineering Dept. at 694-4448.**

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# INTRODUCTION



The City of Moose Jaw promotes composting as a way to help reduce the amount of waste materials going to our landfill. Composting also produces a free soil conditioner which improves soil quality and helps plants flourish.

Anyone can compost. Composting is no longer an option just for homeowners. Office buildings, businesses and apartment/condo dwellers now have a way to recycle food materials through “vermicomposting” or worm composting.

To assist with YOUR composting and find the method that is best for you, the City of Regina has compiled this “how to” booklet with tips for beginners and composting veterans alike.

## What Is Composting?

Composting is a natural process that breaks down kitchen, lawn, and garden materials into a dark, earthy, soil-like material called “compost.” This end-product is an excellent soil conditioner for plants, gardens, and lawns.

## Why Compost?

- Composting provides a free, top-notch soil conditioner that improves plant, garden, and lawn growth.
- Compost acts like a sponge, helping soil retain moisture and nutrients.
- Compost helps break down heavy clay soils or helps to bind sandy soils.
- Soils rich in compost experience less erosion and reduced quick runoff.
- By returning nutrients back into the soil, compost reduces the need for expensive chemical fertilizers.
- Composting household materials will save landfill space. The amount of waste you send to the landfill will be reduced by 1/3 to 1/2.
- It’s easy! You don’t need any technical knowledge or equipment.

# MATERIALS

## What You Need To Compost

The basic elements needed for composting are:

- organic materials (food) ;
- air ;
- water;

all in the right amounts.

To add efficiency, you will also need:

- a container for collecting kitchen scraps;
- a pitchfork, shovel or other turning device;
- a bin for your backyard.



# Materials To Compost

All organic (compostable) materials contain a mixture of carbon and nitrogen; this is known as the carbon:nitrogen (C:N) ratio. For best results your compost pile requires a balance of carbon and nitrogen, with the optimum ratio being 30:1.

Items containing carbon are generally brown in colour, such as autumn leaves or straw. Items containing nitrogen are generally green in colour, such as kitchen scraps and green grass clippings.

A rule of thumb is to have roughly equal amounts of browns (carbon) and greens (nitrogen). This 50/50 rule will balance the carbon:nitrogen ratio at the proper level.

The following is a list of some of the different green and brown materials that can be composted. It is not a complete list. Other materials may be added.



## Greens... Nitrogen Rich

These materials are usually moist.

- green leaves
- weeds before they go to seed
- vegetable/fruit peels and scraps
- spoiled food
- green grass clippings
- coffee grounds, including the filter
- tea bags
- egg shells (crushed)
- breads
- cooked pasta and rice
- flowers

## Browns... Carbon Rich

These materials are usually dry.

- evergreen needles
- dry leaves
- dried brown grass clippings
- bark chips
- straw
- prunings and cuttings
- dryer/vacuum lint
- hair
- bird cage cleanings
- cardboard/paper\*
- sawdust\*

\* These items should be used in limited quantities because they decompose slowly.

# Materials to Avoid

Even though you can put most of your organic materials in your compost bin, a few materials should be avoided since they cause odours and/or attract pests.



## Do Not Compost ...

- meat, bones and fish scraps
- dairy products
- fatty/oily foods, including cheese, butter, oil, and salad dressing
- weeds with mature seeds
- pet wastes
- walnut shells
- rhubarb leaves
- plants or grass clippings that have been treated with chemicals
- diseased or insect-infected plants
- charcoal or coal ashes

**HELPFUL HINT:** If you have weeds with mature seeds you want to compost, you have to kill the seeds with heat first. Place the weeds in a sealed black garbage bag and let it sit in the sun for two or three days. The dried weeds can then be added to your compost pile.

## Collecting Materials

Materials will be generated in two main areas of the household: the kitchen and the yard.

The simplest way to collect kitchen materials is to use some sort of container. Two or four litre plastic ice cream containers work well. The container can be kept on a cupboard or under the sink. As you produce material, put it in the container and when it is full take it out and add to the compost pile. A container lid is not necessary, but will help eliminate odours.

Yard materials can be added to the compost pile as they are produced. At times you may get large volumes of certain materials, such as leaves and grass clippings, which can be handled easily in a number of ways.

**HELPFUL HINT:** Chop materials up before you put them into the composter. The smaller the material, the more surface area is exposed, and the faster it will decompose.

## Leaves

Leaves are very compostable, but they accumulate quickly in great numbers. If you have too many leaves to fit into your composter, here are a few suggestions:

- dig some into the soil for spring planting;
- use them as mulch around plants and trees;
- pile the leaves in a corner of your yard. They will break down fairly quickly;
- store them in bags. Add them to the compost pile as you need them;
- shred the leaves to reduce the volume. Do this by running over them with a lawn mower. Or, put leaves in a garbage can and use a weed trimmer to break them down.

**HELPFUL HINT:** Leaves will lose over 3/4 of their volume when they are composted. What looks like a large pile of leaves will be a small pile of composted material.

## Grass Clippings

Grass clippings are another item that can be generated in large quantities and may be difficult to handle in your compost bin. The trick with grass clippings is not to add too many at once since they tend to mat together and smell. Instead, put in limited quantities of green clippings and add some brown material with it.

**HELPFUL HINT:** If you let your clippings dry out in the sun, they will become a carbon source and can be used to mix with fresh clippings.

# FACTORS IN COMPOSTING



## Air

Air is necessary in order for organic matter to decompose quickly and without odour. If there is a lack of oxygen in the compost pile, it will begin to smell like rotten eggs and decompose slowly.

Air can be incorporated into your pile in a couple of simple ways:

- Turn your pile with a pitchfork, shovel, or use a special aerating tool. Turning the pile will also help mix in new material.
- Place an aeration stack in the centre of the pile. Use a piece of pipe or a bundle of twigs to let air circulate down into the pile.

There is no set rule for how often to turn or aerate your compost. There are many factors that determine the frequency of turning, such as: the size of the pile; the types and amounts of material being added to the pile; and how fast you want finished compost.

A basic rule of thumb is the more work you put into the compost, the faster the compost will work. Turning the pile every week or two will result in faster composting, provided that all the other factors in composting are maintained.

## Moisture

Moisture is needed to keep your compost pile active. The microorganisms that decompose the organic matter need moisture to move around and break down the material. Keep your pile about as moist as a well-wrung sponge. A good way to test the moisture level is to take some compost and squeeze it in your fist; you should get a couple of drops of water coming through your fingers.

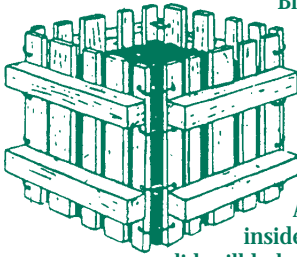
If the pile becomes too dry, composting activity will slow down and eventually stop. Adding moisture to the pile is easy:

- use a hose or watering can. Turn the pile as you add water to allow for even distribution of the moisture;
- leave the lid off during rain storms.

## Heat

If a compost pile has enough water and oxygen, a good balance of material, and enough volume, temperatures in the pile may reach above 55 C. Heat is the result of the work of the microorganisms that are decomposing the organic material. The higher the temperature, the more work being done. The compost pile should feel warm or hot to the touch when you dig into it. Temperatures of 55 C are desirable because they kill weed seeds and speed up the composting process.

# COMPOST BINS



Bins help you control the moisture of the pile, keep out pests, and make your yard look neater. However a bin is not absolutely necessary for composting. A compost pile in a well-drained area of the yard will work fine.

## What To Look For In A Bin

A well-designed bin should allow easy access to the pile inside and have spaces or holes in the sides for air to circulate. A lid will help retain moisture but is not necessary.

The recommended bin size is about 3 feet high, 3 feet wide and 3 feet deep (1 metre cubed). This will allow you to make a compost pile that is large enough to generate heat, but not too large to handle/turn.

There are a few things you should consider when looking at a compost bin for your yard:

- aeration or airflow. Look to see how the air will flow through the bin; the greater the airflow through the unit, the less need for turning.
- accessibility to the composting material. This is important when turning and aerating the compost. Bins that have a removable front will be easier to turn and work with.
- the look of the compost bin. The bin will be a fixture in your backyard, so it is a good idea to have something that you don't mind looking at or one that doesn't look out of character with the rest of your yard.

You can either make your own compost bin or you can purchase a commercially made unit.

**HELPFUL HINT:** Two bins or a two-compartment bin allow you to have one compost pile of material that is finishing, while you add fresh material to the other pile.

## Building Your Own Compost Bin

It is very easy to build your own compost bin. You can build a unit out of wood, mesh, concrete blocks, or you can modify an old barrel or garbage can.

To build your own, all it takes is some scrap lumber or other material and a little imagination.

- It can be three sided, leaving the front open. If you put a front on, it's a good idea to make the front removable so that you turn the compost easily.
- Make sure there are air gaps/spaces along the sides of the unit to allow air to flow through.
- It is recommended that you leave the unit open to the ground. If you do put a floor in your unit, make sure it has drainage holes to allow excess moisture to run out. Otherwise, your compost will become too wet.





- **DO NOT USE** pressure treated or other treated lumber to build a compost bin. The chemicals that are in the wood can leach out and get into your compost. Also your bin should not be painted. If you do paint your bin, use a latex based paint and only paint the outside parts of the wood.

Modifying a barrel or garbage can into a compost bin is very simple. Just remove the bottom and drill air holes into the container. Drill the air holes large enough to insert something like a broom handle which will aerate the pile.

**HELPFUL HINT:** If rodents are a concern, line the inside of your bin with screen or mesh.

## Choosing a Bin Location

Choose a corner or spot in your yard that is easily accessible in both summer and winter. This location should also have good drainage and a mixture of sun and shade. Too much sun may dry out the pile; too much shade may keep it wet. However, in either circumstance the compost will work fine with a little care.

You may want to put your bin over a portion of your garden so that nutrients from the pile will end up in a useful place. As well, the microorganisms in the soil will be able to move up into the pile.

Having space around the bin will help with the storage of extra leaves, soil or other materials.

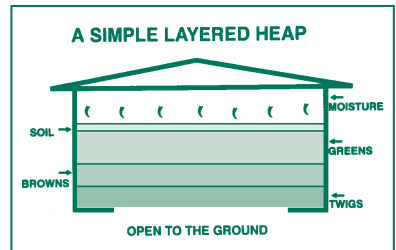
## WORKING WITH YOUR COMPOST PILE



### Building Your Compost Pile

When you are first building your compost pile, it is a good idea to layer the materials being put in.

- Start with a layer of twigs or other coarse materials at the bottom of the compost. The layer should be at least 5 cm thick. This will allow air to get to the pile from below.
- Next add a layer of brown material, followed by a layer of green material. Each of the layers should be between 5 - 10 cm thick.
- Add a thin layer (no more than 2 cm) of your own garden soil which will introduce microorganisms to the pile.



This layering method is a good way of getting the composting processes started. After a few days you can begin combining the materials, by either turning the compost or just adding materials to your compost bin as you accumulate them. When adding fresh materials, especially kitchen scraps, bury them into the compost pile or cover them with a thin layer of soil or

some brown material. Doing this will reduce any problems with pests such as fruit flies.

Remember to follow the 50/50 rule (i.e. half greens, half browns) as you add new material. Also, try to mix coarse and fine materials to avoid compaction of the pile.

**HELPFUL HINT:** If you want to activate your pile, try adding some manure, high nitrogen fertilizer, or grass clippings.

## How Long Does Composting Take?

The length of time to compost organic matter varies greatly due to all the different factors involved.

If you meet all the nutritional needs of the pile, shred the material being used, maintain the optimum moisture level, and turn the pile every week, then compost can be ready in as little as two or three months.

On average, by adding material as it is generated, turning the pile occasionally and making sure that the moisture level is sufficient, you will have finished compost within about a season (year).

## USE OF COMPOST

### Harvesting Your Compost



The composting process is complete when the ingredients are no longer recognizable. Finished compost is black, crumbly, and sweet-smelling.

Even though you are always adding material and turning your pile, you will end up with a layer of finished compost towards the bottom. Remove the unfinished material from the top of the pile and set it aside. The finished compost can then be taken out, and the unfinished material placed in the bottom of the bin.

In order to remove materials that have not completely decomposed from the finished compost, sift the compost through a framed piece of metal screening. The screening may be 7mm - 21mm (1/4 inch - 3/4 inch), depending on the desired coarseness of the compost. All of the incompletely decomposed materials can then be thrown back into the compost bin.

**HELPFUL HINT:** An easy way of getting to the finished compost is to tip/knock your bin over, then set up your bin and place all the uncomposted material back into the compost bin.

## Using Your Compost

There are many ways to use finished compost:

- It can be added directly to the garden or flower bed and worked into the soil. This is best done in the fall or spring. It's a great soil conditioner.
- Mound compost up around the base of plants and trees during the growing season. The nutrients from the compost will leach into the soil and roots of the plants. In the fall, just work it into the garden.

- Top dress your lawn, by spreading the compost in a thin layer over the grass. It will incorporate itself into the soil.
- Compost can be used for bedding plants or added to your house plants. For starting or transplanting, use a mixture of half compost and half potting soil.
- Brew some compost tea. Place some compost in a burlap sack or nylon sock and soak it in water. The nutrients from the compost will be leached into the water. Use the resulting “tea” to water flowers, vegetables and indoor plants.

**HELPFUL HINT:** If you are worried about bugs when using the compost in the house, sterilize it. Just bake the compost in the oven at 175° F for about half an hour and it will be fine.



## TROUBLESHOOTING

If you follow the above guidelines, your composting operation should run fairly smoothly. If something is wrong, you may discover one or more of the following symptoms:

SYMPTOM:	PROBLEM:	SOLUTION:
The compost has a bad odour	Sulphur odour (rotten egg smell) occurs when the pile is too wet. Ammonia odour occurs when there is an excess of nitrogen or green material.	For sulphur smells, simply mix in dry ingredients, such as soil or dried leaves or grass clippings. To remedy ammonia odour, add materials containing more carbon, such as leaves or dry grass clippings. Other methods of dealing with odours: <ul style="list-style-type: none"> <li>• Turn the pile. Extra soil added during the turning will help with the immediate odour problems</li> <li>• Mix in materials that do not compact, such as green twigs and plant stems. These will help to create more air voids.</li> </ul>
Compost pile will not heat up	If your pile remains cold, it lacks moisture or nitrogen or your pile is too small.	Check the moisture level of the pile. It should be about as moist as a well-wrung sponge. Add high nitrogen materials, such as fresh grass clippings or vegetable scraps. Your pile should be at least about 3 feet x 3 feet x 3 feet (1 metre cubed). If it is smaller than this, add more materials.
The compost pile is attracting pests	If pests such as dogs, skunks or mice, are attracted to your pile, improper materials have been added.	Do not add meat, fish, bones, dairy products or oily or greasy food. If you are concerned about the pile attracting mice, create a bin that is fully lined with 1.25cm (1/2 inch) metal mesh. Lids are also helpful for keeping out pests. To avoid problems with flies, make certain that all freshly deposited kitchen scraps are covered with soil or buried into the pile.

SYMPTOM:	PROBLEM:	SOLUTION:
Process is too slow	If the organic matter is decomposing too slowly, the particles in the pile are too large.	Cut waste materials into small pieces no larger than 20-25 cm (8-10 inches). Mix in small amounts of topsoil with the materials. Adding livestock manure will also activate your pile.
Compost pile is too wet	A very wet compost pile signals poor drainage, too much rain, or a lack of air.	Move the compost bin to a location where there is proper drainage. Add dry leaves. Turn the pile to circulate air and remove the lid to allow evaporation.

## WINTER COMPOSTING



As winter approaches and temperatures dip well below freezing, you can continue to compost. Your compost pile will freeze, but that will help the material break down and decompose in the spring.

In the fall, leave room in your compost bin to add materials. Then during the winter, simply add your materials as they are generated. You don't have to worry about digging the fresh material into the pile because when it is frozen it won't be a pest attractant. Keep your compost bin covered with a lid in the winter to prevent it from filling up with snow and ice. When spring arrives, the materials will thaw out and begin to decompose. When the compost has thawed, turn it over, and within a couple of days, the material should lose about half of its volume.

**HELPFUL HINT:** If you don't want to make too many snowy treks to the compost bin, put a covered bucket by the back door and empty it later.

## ALTERNATIVE FORMS OF COMPOSTING

Setting up a compost pile in the backyard is one way to compost. There are other forms of composting that will remove organics from the garbage and return the nutrients back to the soil.



### Don't Bag It

Recycle grass clippings by leaving them on the lawn after mowing. This is a simple system of turf maintenance that:

- returns precious nutrients to the lawn;
- makes the grass greener;
- leads to a deeper, healthier root system;
- increases the lawn's resistance to disease, drought and insects.



No special mower is necessary. For best results, keep the mower blade sharp and cut only when the grass is dry. Don't cut more than one third of the grass blade off at a time. Cutting the grass too short and not often enough are common errors of lawn care. You can also prevent excessive grass growth by watering and fertilizing in moderation.

## Trench Method

If you only have household scraps to compost or want to deal with them separately, you can use the trench method. Simply dig a trench in your garden or backyard, and add scraps as they are generated. Cover them with about 20cm (8 inches) of soil.

You should wait about a year before you plant anything in the trench area because the bacteria breaking down the organic matter will compete with your growing plants for nitrogen. This may mean that young plants won't do too well until the material in the trench has decomposed.

## Mulching

This is simply taking organic material such as leaves, grass clippings or woodchips, and using them as a ground cover to reduce weed growth and retain soil moisture. Just place a layer of material 4 - 8 cm (1.5 - 3 inches) thick around plants, trees or open spaces in the garden. The material will decompose over time and be incorporated into the soil.

## Sheet Composting

This form of composting is very similar to mulching. Spread a thin layer (1 - 3 cm) of material such as leaves or plant remains over your garden. Then dig or rototill the material into the garden. It is best to do this in the fall, and by the spring, the material will have decomposed and been incorporated into the soil.

# VERMICOMPOSTING



Vermicomposting uses worms to compost food materials. You can compost indoors year-round. It is a perfect method for the office, apartment or condo, or if you don't want to make trips to the backyard compost bin during the cold winter months.

The worms used for vermicomposting are called red worms. They are different from the earthworms you find in your garden. Red worms like the same temperature range that we do and will eat the same types of food scraps that would normally be put in a backyard compost bin.

## Starting a Bin

You will need:

- One to two pounds of red worms are needed to start your vermicomposter. They cost about \$20/lb, but will multiply. Within a year, you will have enough red worms to give away to a friend!
- A red worm can eat up to its body weight in food every day. Keep track of the amount of food waste you have per week. This will give you a rough idea of how many pounds of worms you need.
- Shallow plastic utility containers make the best kinds of bins to hold the worms. A storage container which is 61cm x 40.6cm x 22.2cm (36L) is a good size to begin with. You can always expand by adding other bins.

**Note:** It is a good idea to wash out the container prior to adding the worms and bedding. Punch holes in the lid for air circulation. If you find that the bin is too moist (the worms will be trying to get out), you may want to drill holes in the bottom for drainage. If you do, you will need to put a tray under the container to catch the extra moisture.

These bins can be stored anywhere as long as they are not subject to freezing or rain. The best temperature range for worms is between 13 C and 25 C.

• The worms need bedding. Beddings can consist of any of the following:

- . • shredded newspaper;
- . • shredded cardboard;
- . • animal manure;
- . • saw dust;
- . • leaf compost;
- . • peat moss.

**HELPFUL HINT:** We recommend shredded newspaper, because it is accessible and inexpensive. Be sure that the ink on the paper you are using does not contain toxins. The Moose Jaw Times Herald, Regina Leader Post and the Regina Sun are safe because the inks are vegetable-based. Soak the bedding in water before adding it to the container. Bedding should be kept about as moist as a well-wrung sponge. Eventually the bedding will be eaten by the worms.

## Feeding the Worms

You will need a container to start collecting “food” for the worms. Keep the container in a handy place so you can add the material as you collect it. Any container will do; it should have a lid though and it shouldn’t be any larger than about two litres.

The worms don’t have to be fed on any regular schedule; simply add the collected materials when your collection container is full. Begin by adding the entire container of food to one corner of the bin. At the next feeding, add the food in another part of the bin, and so on following a systematic pattern until you get to the far corner of the bin. You then start over where you added the food the first time. This will indicate how the worms are doing. If there is still a lot of uneaten food where you first started it means that the worms are a little behind. Simply wait a few days before adding more food.

- It is important to remember that when you add food to your bin, it must be buried/covered over. This will allow the worms to get at the food and also will prevent fruit flies from becoming a problem.

Worm food includes:

- fruit and vegetable scraps;
- plate scrapings;
- spoiled food;
- tea bags, coffee grounds and filters;
- breads, rice, pasta;
- egg shells.

Be sure to chop up the material a little bit before adding to the bin. The smaller the material is, the faster the worms will be able to eat it.

## DO NOT ADD:

- meat, fish or bones;
- dairy products;
- greasy, fatty, or oily food.

Just like in the backyard compost bin, these materials will create odours and problems.

Worms are not high maintenance pets. If you are going on vacation for a couple of weeks, there is no need to get a “worm-sitter”.

## Harvesting the Finished Compost

The bin will be ready to be harvested between four and six months. The material will be a rich, black, soil-like product.

To harvest it:

- simply dump the contents of your bin onto some newspapers or a plastic sheet;
- separate it into a few cone-shaped piles;
- shine a light on the piles for about 10 minutes; the worms will start to move towards the centre of the pile (worms are light sensitive);
- begin to scrape the finished compost off the sides of the piles.

Repeat this process a few times and you will end up with a bunch of worms at the bottom of the pile. Put fresh bedding in your bin and re-introduce the worms.

Another option is to move the compost to one side of the bin, and put fresh bedding on the other side. If you put food on the side with fresh bedding for a few weeks, all of the worms will move to that side. You can then remove the finished compost. Continually switch sides of the bin if this method works best for you.

## Common Problem

Some people with worm bins experience problems with fruit flies. These pests usually appear when you don't bury the fresh material into the bin. You can make a trap which will keep them under control. All you need is a jar, a plastic bag, a rubber band, and some beer. Pour about half a cup of beer into the jar. Place the plastic bag over the mouth of the jar with one corner reaching down into the jar. Poke a small hole in the corner of the bag with a pencil. Secure the bag around the rim with the rubber band. Fruit flies will find their way into the jar, but will not be able to get out. Another option is to take a vacuum cleaner and “vacuum” the bin. This will suck up all the flies and kill them. You may have to do this a couple of times to rid yourself of the infestation.

An excellent resource on vermicomposting is:

Worms Eat My Garbage, Mary Appelhof,  
Flower Press, Kalamazoo, Michigan, 1982.

