

SOIL HEALTH – Vermicomposting

What is vermicomposting?

Vermicomposting is simply composting with specialty worms known as red wigglers. The worms breakdown food scraps into nutrient rich compost.

What are the benefits of vermicomposting?

- The resulting vermicompost, or worm cast is a nitrogen rich natural fertilizer
- You will **reduce the amount of garbage**
 - The average Canadian produces a tonne of waste each year
 - Estimated 40% of household waste is organic matter
 - Organic and one of the best soil additives on the planet
- Worm castings conserve moisture and improve soil conditions. Enhances growth and yields.

How to use worm compost/castings?

- Castings can be used immediately, or stored for future use.
- The castings can be added directly or mixed with potting or garden soil as a soil amendment.
- Castings can be used as a top dressing for indoor or outdoor plants
- "**Compost tea**" can be made with castings

Red Wiggler Worms

- Red Wigglers (*Eisenia foetida*) are from the same family as the common earthworm or Night Crawlers (*Lumbricus terrestris*)
- Main different and the main reason Red Wigglers are preferred vermiculture specialists, is that Night Crawlers like to draw food down into burrows (up to 6 feet deep), whereas Red Wigglers prefer to eat on the go.
- Being top feeders, Red Wigglers scavenge for food just 6" - 12" below the surface, making them perfect for a composting environment.
- Worms require oxygen to survive, the oxygen is absorbed through their skin

Making your "Bedding"

- **Dry Bedding Material**
(use a combination of one or more dry bedding ingredients listed below)
 - Brown leaves/straw
 - Shredded paper or newsprint (avoid glossy paper)
 - Egg cartons /coffee trays
- 2 Tablespoons - crushed eggshells or agricultural lime
- 1 litre of soil (ordinary garden soil)
 - Soil provides two benefits for the worms.
 - First, Soil serves as the teeth for the worms. Worms do not have teeth and cannot chew their food. They grind their food in their gizzard using muscle action and small bits of soil.
 - Secondly, soil adds necessary microbes into the worm bin. It is these microbes that break down the food scrapes preparing it for the worms to eat



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Steps to Prepare Bedding

1. Fill worm bin with dry bedding material. (leaves, shredded paper, etc.)
2. Add water (approximately 2-3 litres) and mix contents.
3. Bedding should be the consistency of a wet sponge.
4. Pour off any excess water. (Worm bin should be ½ full of wet material)
5. Add more dry bedding or water as required.
6. Add crushed eggshells/limestone and soil.
7. Add the worms.

Bin Preparation & Location

- Most worm are ventilated, using a bin with no holes ensure your worm bin is fully ventilated; drill *at least* 10-20 - 3/16" holes in your bin on the top of the lid.
- As most worm bins have air holes in the bottom, the worm bin should be raised off the ground. A tray should also be placed under the worm bin to catch any excess liquid.
 - If liquid is dripping out of the bottom, this is an indication the worm bin is too wet
- Store worm bin in cool, preferably dark place. Worms can live in 5° C - 30° C (40° - 90° F) temperature, ideal temperature 15° C - 21° C (60° - 70°F).
- **Do not allow worm bin to freeze.**

Adding the Worms to the bin

- Water should be left out overnight prior to preparing bedding.
 - This will insure any chlorine evaporates and will bring water to room temperature.
Do not use water from a water softener - the salt will burn your worms.
- Be sure to add the worms to the composter under direct light.
- Place the worms on top of bedding; their natural photophobic tendencies will force the worms into the bedding to a darker, more comfortable environment.
- Allow the worms to settle into bedding for a few days before feeding for the first time.
- When deciding how many worms to purchase, use the 2:1 ratio. (Two pounds of worms for every pound of kitchen waste produced per day).

Feeding the Worms

- As the worms do not like to be disturbed, it is best to feed the worms 1-2 times per week rather than daily.
- Worms eat about half their weight daily. If feeding twice a week, add 1.5 - 2 lbs. each time.
- If a lot of food scraps are left over from previous feeding wait a day or two prior to adding additional food.
- Bury food a couple of inches under the bedding. Bury the food in a different location each time. Be sure to cover food with bedding.



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- Fruit flies are attracted to exposed food. Sprinkle a handful or so of crushed eggshells on top of bedding about once a week. Eggshells counter the acidity in food scraps. **Do not over feed the worms!**
- Add additional bedding (eg. leaves, straw, shredded paper, etc.) when it is difficult to bury food scraps. Also helps absorb excess moisture if bedding becomes too wet. Worms generate heat and produce liquid; therefore, condensation will form on the lid.

Worm Food		
Fruit/vegetable peels	Coffee grounds/filters	Plant cuttings
Tea bags	Crushed eggshells	Brown paper towels
Cooked pasta & rice (no sauce)	Egg cartons/coffee trays	Breads/cereals/grains
Leaves/grass clippings	Newspaper (no colour print)	Beans

- Worms do not have teeth, they have a gizzard and use the soil to process their food. Chop the organic material into small pieces, the smaller the pieces, the greater the surface area to rot. The worms can process the organic matter more rapidly
- **Do not include:** meat & dairy products or citrus

The Harvest

- Harvest the worms when bedding has almost all been consumed (or turned into beautiful black castings) (4-6 months).
- Do not feed the worms for one-two weeks prior to harvesting; allow the worms to finish their job.
- If any bedding or organic material is remaining, simply set aside and add with new bedding.
- There are several methods for harvesting, the two key methods are ‘Dump and Sort’, or ‘Side to Side’.

Dump and Sort

1. Under bright lighting, empty composter contents onto a plastic sheet.
2. Separate into pyramid shaped piles. Wait 10-15 minutes.
 - Worms are very photosensitive, so to avoid the light, the worms will crawl to the bottom of the piles.
3. Remove the top portion of each pile.
4. Repeat this process until only the worms are remaining.
5. Add the worms to fresh bedding and start vermicomposting process over again.
6. Mix nutrient rich castings in gardens and houseplants.



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Side to Side

1. Feed the worms on one side of the bin for a number of weeks, this will force the worms to migrate to that side of the bin.
2. Once the worms have moved over to the food source, remove the castings from the vacated quadrant, and replace the castings with fresh bedding (see bedding preparation above).
3. Wait a week or two then repeat the process in the opposite direction, herding the worms into the new bedding.

What problems might occur?

Some problems that can occur are odour, fruit flies or other pests, bedding drying out, and water collecting in the bottom of the bin.

- Odours: There will be no odour or pests, if food is properly buried.
- Fruit flies: Fruit flies can be an annoying if not managed properly. Fruit flies are attracted to exposed fruit in a worm bin. The first defense against these critters is to make sure all food stuffs are buried under the bedding. The worms will eat the bedding, so if you are having a hard time burying you food simply add some more shredded paper on top. If you already have a bad infestation, you can use a vacuum to suck up any flies (be sure to empty vacuum bag right away or the flies will make their way out again). Then remove the top inch or two of the bedding. This will get rid of any fruit fly eggs that have been deposited in you bin.
Pests: Vermicomposting is usually done indoors, so rodents are not an issue. A properly managed worm bin will not create odours that attract rodents.
- Bedding drying out: In a plastic bin it is rare that the bedding dries out. If your bin is drying out, simply add non-chlorinated water (let tap water sit for 12 - 24 hours before adding to worm bin).
- Water collecting on the bottom: If the worm bin is too wet and water has collected at the bottom, use a turkey baster to suck up the excess moister. Add fresh shredded paper.

Key resource Cathy's Crawlies - <http://www.cathyscomposters.com/>

