Worm Farms/Bins, Earthworms, Earthworm castings, and Vermiliquid
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As long ago as 1881 Charles Darwin wrote: It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organized creatures.

We are fortunate that Vermiculture is now easily available to everyone through the designs by Worm Experts who have taken composting worms (Eisenia fetida) and introduced them into efficient, neat and compact structures that we call Worm Farms/Wormeries/Worm Bins. It is also quite easy to make your own one, you just have to browse the internet and there are a multitude of videos and instructional offerings to choose from.

So, for those of you who live in suburbia, or who would like the byproducts easily available, there are some wonderfully designed and productive Worm Bins available in South Africa through various Vermiculturalists (a few are examples shown below). They are easy to install in your home and you make use of the byproducts to revive and regenerate your soil, both in the garden and in your pots.

Of course a very important point should be made here, in processing all your green waste through a Worm Farm/Wormery, you are reducing the amount of waste that would be disposed of to a landfill, and in so doing you are reducing the amount of methane produced which is causing so many climatic problems that are linked to this gas.

So if you want to reduce your impact on the planet, get a wormery as a positive step forward. Click here to find a supplier of a wormery that you desire.
Before I discuss with you the benefits of the byproducts of Wormeries, I feel I should bring to your attention that there is a huge difference between how the Common Garden Earthworm operates and a Composting Earthworm. Please don’t try to use a common garden earthworm (known as “the nightcrawler” or lumbricus terristris) as this earthworm is a BURROWER, and will kill itself trying to burrow in a worm bin.

Red Wrigglers (Eisenia fetida) Common Earthworm (lumbricus terristris)

Composting Earthworms (Eisenia fetida) can be kept in containers and they will process your green kitchen waste for you and produce vermiliquid and vermicompost that you can use in your pots and on your gardens.

A word of caution though, composting worms (red wrigglers) cannot tolerate temperature extremes, and though they can survive inside a compost pile, will perish if left to their own in garden soil.

Wormeries/Worm Farms/Worm Bins

A wormery is an easy, cheap and efficient mechanism for converting organic waste which will yield you a brown liquid which you can mix with water and apply to all your plants and vegetables, as well as a rich organic compost (vermicompost).

Wormeries can be made of different materials and vary in design from one supplier to another. Usually you take your green kitchen waste and place it in the the top tray and processed waste is harvested from the bottom tray. The earthworms migrate upwards towards the fresh waste in the top compartment. Once the vermicompost is ready in the bottom tray, it is removed, and the tray is refilled with fresh organic waste and moved to the top of the wormery. This however varies from brand to brand.

Each wormery contains a large number of rapidly breeding earthworms (each worm egg yields 4-7 worms) whilst they process organic waste. They are haemaphrodites (possess male and female reproductive organs) and the worms that you would use in a wormery (red wrigglers) are very productive breeders. They lay one egg capsule every seven days or so and each capsule hatches an average of three to four earthworms. Hatched earthworms typically grow into breeders in roughly three months. ONE WORM CAN PRODUCE 1000 WORMS IN ONE YEAR!
Copulation and reproduction are separate processes in earthworms. The mating pair overlap front ends ventrally and each exchanges sperm with the other. The cocoon, or egg case, is secreted by the clitellum band which is near the front of the worm. After the worms have separated, the clitellum secretes the cocoon which forms a ring around the worm. The worm then backs out of the ring, and as it does so, injects its own eggs and the other worm's sperm into it. As the worm slips out, the ends of the cocoon seal to form a vaguely lemon-shaped incubator (cocoon) in which the embryonic worms develop. They emerge as small, but fully formed earthworms, except for a lack of the sex structures, which develop later in about 60 to 90 days.

**Worm Byproducts and their uses**

The end results of a wormery (vermicompost/ worm castings and vermileachate/worm tea) are easily collected and can be used in your garden, veggie patch or farm through direct application or irrigation.

**A word of caution**, worms do not perform well when exposed to severe changes in temperature and therein require protection from the elements. They are easy to manage and odorless. The size of the wormery is determined by the volume and type of organic material to be processed, and your budget.

There are 2 amazing byproducts that you are able to use from a wormery:

1. Vermileachate /Vermiliquid (also referred to as “worm wee, worm tea, vermi-tea”)
2. Earthworm castings (Vermicompost)

**Vermileachate (Vermiliquid)**

A rich liquid is produced by earthworms when converting organic matter into vermicompost. When natural organic wastes are processed through the earthworms’ digestive system, what is produced is a full range of pure, immediately available nutrients, together with a multitude of beneficial microbes.

When used correctly it acts as a catalyst to help release locked in nutrients and provides stimulants for vegetable and flowering plants. The results are incredible, and the time it takes for a vegetable seedling to be ready to harvest is substantially reduced substantially. What is even more obvious is that the vegetables are noticeably healthier,
bigger and nutritious, and TASTE amazing. This liquid should be used **IN CONJUNCTION** with the worm castings to get great results. If you just use the liquid on its own it acts as a short term growth promoter in plants (kind of like a liquid Viagra for plants!) but does not return the soil into balance without the vermicompost (worm castings).

A great deal of research has been done on the benefits of using worm related products, and what has come to light is that using these products **inhibit some diseases and promote nitrogen fixation in the soil. It is most effective when used when no till is employed and when composting and mulching practices are observed.**

Other benefits of using composted worm tea use include:

- reduced insect infestations
- reduced water requirements for vegetation
- it is non toxic around pets and children
- it will not burn plants if overused

In addition to pest controls, compost tea also attacks and prevents fungus growth. The tea appears to be faster acting when compared to chemical based pesticides. Even better, compost tea is similar to charcoal. It has no odor and activates to eliminate unpleasant aromas when mixed with animal manure

**VERMICOMPOST**

Digested organic material emitted by worms are called “castings.” These castings are rich with phosphorus, calcium, and potassium. So, the next time that you’re thinking about fertilizer for your gardens think worm castings.

The castings are an organic fertilizer that can be used safely – as little or as much as you like – they are only beneficial to the soil. They also act as an insect and disease repellant, controlling plant pathogens and root eating nematodes. And unlike chemical fertilizers, all natural worm castings won’t burn tender roots.

Worm castings have a wonderful earthy smell -no unpleasant or chemical odor. They are full of nutrients, and can contain more than 60 micro nutrients and trace minerals (sometimes as much as eleven times more nitrogen, potassium, calcium, phosphorus, potash and magnesium than actual topsoil!). Worm castings also help create channels within the layers of the earth’s soil, which helps to hold water better and keep moisture in the soil longer.

Studies have shown the benefits of using these 2 byproducts very successfully:
If you are an **organic farmer** and would like to use worm byproducts on your farm, then **start an agricultural worm bed** (you may need more than one if you have a large area under cultivation).

So, for anyone who is passionate about gardening or growing their own vegetables, you would benefit enormously from adding a wormery to your box of tools in creating a rich soil in which plants thrive and yield prolifically, and eradicate the necessity to use non-organic fertilizers as well as pesticides and fungicides in your garden.

**Lastly, some interesting and amazing information on Earthworms:**

- Earthworms can survive only in moist soil. However, too much moisture is also not good for them.
- Earthworms are hermaphrodites i.e. a single individual has both female and male organs.
- An earthworm can replace or replicate lost segments. However, the extent of this ability depends upon the species as well as the amount of damage.
- Earthworms usually come out of the dirt after excessive rain storms, since the soil becomes too moist for them to survive.
- Earthworms can be found in almost every type of soil. At the same time, their number greatly increases with the improvement in the health of the soil.
- An earthworm does not have lungs. Rather, it breathes through its skin.
- There are basically four types of earthworms: Nightcrawlers, Garden Worms, Manure Worms and Red Worms.
- After digestion, earthworms produce excrement that is about the same size as a pin head.
• In times of drought, an earthworm (lumbricus terrestris) can dig deep into its burrow, which can be as deep as six feet.
• Rototilling of the soil can be harmful to composting and burrowing earthworms.
• Even though earthworms are hermaphrodites, they need to mate with another worm to produce offspring.
• Earthworms do not have eyes, but are extremely light sensitive.
• An earthworm can consume as much as one third of its body weight in a single day.