

A VERMICULTURE GUIDEBOOK



A GUIDE BY:

KATE DOUGHTY

AND

KATRINA HENDERSON

SPRING, 2016

TABLE OF CONTENTS

1. What is vermiculture, anyway? -----	2
2. How does it work? -----	2
3. Why worms? -----	2
4. Why do it? -----	3
5. Caring for our Worm Friends -----	4
6. Mitigating Potential Problems -----	4
7. Weekly Duties -----	5
8. How To Tell When the Compost is Ready -----	5
9. References -----	6

WHAT IS VERMICULTURE, ANYWAY?

Vermiculture is the process of using red worms (as opposed to Earthworms) to decompose organic food waste and transform it into luscious, nutrient-rich **vermicompost** (waste supplemented by the worms castings, a.k.a. worm poop) that supports happy, healthy plants.

HOW DOES IT WORK?

Worms are nature's recycling system, or in the words of Aristotle, "worms are the Intestines of the Earth." These little creatures aid in the process of breaking down organic material, and make nutrients available in forms that can be readily taken up by plants.

WHY WORMS?

Because worms are wonderful! Don't believe it? Here are some fun facts about worms you probably never knew:

- Worms can consume 50-100% of their body weight every day
- Each worm can process about 10 pounds of organic material per year
 - They have gizzards which gives them the ability to even process tiny rocks, grinding them into a paste that enriches the soil
- There can be anywhere from 250,000-1.75 million earthworms per acre of land, depending on the quality of the soil (poor quality = fewer worms)
 - On an average farm, the livestock above ground may be outweighed by the worms below
- Worms are hermaphroditic. When they mate, both worms produce children
- Worms are able to regenerate most lost segments of their bodies (though this trait varies among species)
 - There are even a few earthworm species who are able to form two living worms from one bisected worm, although with most worms it is only the side with the head that is able to survive
- The largest worm ever found was **22 feet long**
 - South African Earthworm; average length ~6 feet

WHY SHOULD I?

Vermiculture is a simple and effective means of producing nutrient-rich material that helps plants to grow and promotes a healthy, self-sustaining ecosystem. Firstly, the primary input in vermiculture is organic material, most often in the form of food scraps that would otherwise likely end up in a landfill. In this way, vermicompost helps to reduce the accumulation of waste waste. Additionally, because vermiculture does not require any machinery (and worms themselves are about as taciturn a creature as ever there was), it is a silent process and thus does not add to the issue of noise pollution. It also reduces other types of pollution by saving water (the worms help create pores in soil that increases its water-holding capacity) and reducing the need for energy-intensive, chemical-based fertilizers.

This recycling of food waste also helps to rebuild soil. Vermicompost serves to replenish the nutrients that are taken up by plants and subsequently lost as those plants, and thus those nutrients, are harvested. Worms break down food waste and in the process make the nutrients present available to plants in forms that they are able to absorb and use for critical life functions. This cycle is an example of the natural process of growth, death, decomposition, and then growth again, that naturally occurs in healthy ecosystems.

In addition to improving the soil quality, vermicompost makes life more comfortable for plants as well. The worms themselves create tunnels as they move through the earth. These tunnels serve to aerate the soil as well as improve its texture. This makes it easier for plant roots to not only access adequate amounts of oxygen, but also better penetrate the soil and provide sufficient anchorage to suit the needs of the plant.

All in all, vermicompost is a fun adventure that results in nutrient-rich soil, productive plants, a healthy ecosystem, happy worms, and, of course, a happy you.

CARING FOR OUR WORM FRIENDS

Good news! Maintaining a worm bin is a breeze. That said, there are a few things that ought to be kept in mind.

- **Moisture** - Although the compost in worm bin should not be too wet, lest the worms drown, it should always be kept relatively moist. Dig into the compost a little bit to make sure that the layer beneath the bedding is retaining moisture. If you find that it is too dry, use a watering can to moisten the bin. If you add more bedding to the top, be sure to moisten that as well.
- **Adding food scraps** - When adding food scraps to the bin, move the bedding aside and bury the food in the top layer of the bin before covering it with more bedding.

MITIGATING POTENTIAL PROBLEMS

Although the worm bin is a fairly low-maintenance project, there are still some challenges that may develop. Below is a list of a few potential issues that may arise, alongside their respective solutions.

- **Sour smell?** - This could result from there being too much moisture in the bin creating anaerobic conditions that are not good for our busy little worms. Should this occur, put a temporary hold on the addition of food scraps with high moisture content and spread dry bedding across the bin. It will take some time for the moisture to be absorbed, but this should help alleviate the issue.
- **Sad, dry worms?** - Worms breathe through their skin and require enough moisture to keep their bodies hydrated or else they run the risk of suffocating. If you notice that some worms are not looking too hot, consider the moisture levels of the bin. Water the worms, add moist bedding, and monitor the bin to see if the worms get their wiggle back.
- **Rotting food and rancid smells?** - This can occur when the worms are being overfed. Although composting worms can consume their body weight in food each day, that does not necessarily mean that they are always willing. Rotting, rancid food waste can attract pests, and our worm friends are not fans of acidic environments. In this case, temporarily cut down on the amount of food scraps being added to the bin to let worms catch up.
 - **Underfeeding** the worms is very **unlikely** to be a problem. As long as there is at least some material present for them to consume, worms are said to be able to survive up to a month or two without much attention (but we don't want that.)
- **Too much love?** - Although there is no denying the wonder of these darling worms, there is such a thing as too much admiration. As important as it is to check up on the worms, it is of equal importance not to overly disturb them. Try to open the bins to check on the

worms, add food scraps, bedding, and water, and not do a whole lot else. As much as we love them, the worms will be happiest when allowed their personal time.

WEEKLY DUTIES

As by now you are likely to have surmised, there's not a whole lot to taking care of vermicompost. Keeping on top of the following few chores should be adequate for a happy, productive vermicompost system:

1. If the food scraps are in large pieces, break it down before adding it to the bin. When adding the food scraps, move the bedding, add the scraps to the top layer of compost, and then cover with more bedding.
2. Monitor the moisture of the bin, watering as necessary.
3. Monitor the temperature to make sure it is between 55-75°F. If it's too hot, be sure to keep the bin moist. If it's too cold, make sure to feed the worms foods high in nitrogen. (Our bins are fairly well insulated, so this is not likely to present a problem.)

Essentially, all the worms need is a weekly check in to make sure everything is running smoothly.

HOW TO TELL WHEN THE COMPOST IS READY

Harvesting compost is a pretty simple process. The worms naturally migrate from areas with more broken down materials to areas with fresher materials. Thus, as new materials are added to the adjacent bin the worms will move and the abandoned bin can be harvested.

That said, if the worms do not seem to have fully migrated, the “pyramid method” could be of use. The only things that this method really requires is (ideally) a sunny day, a tarp, and little bit of sorting. The pyramid method entails laying out a tarp, and then collecting compost that is most broken down and arranging it in small pyramid-shaped piles on the tarp. The worms will naturally dig away from the light, so after waiting a few minutes, collect the top layer of compost and then repeat this process until all that remains are the worms at the bottom of the pile. The final step is the simple act of returning the worms to their happy home.

REFERENCES:

- "Common Vermicomposting Mistakes." *Vermicompost.net*. N.p., n.d. Web. 1 June 2016.
<<http://www.vermicompost.net/common-vermicomposting-mistakes/>>.
- "Composting with Redworms." *Composting with Redworms*. N.p., n.d. Web. 16 April 2016.
<<http://whatcom.wsu.edu/ag/compost/Redwormsedit.htm>>.
- "Red Worm Composting: Marcia's Vermiculture Composting." *Worm Poop*. N.p., n.d. Web. 16 April 2016. <<http://www.wormpoop.com/>>.
- "Today I Found Out..... 10 Very Interesting Worm Facts." *Unco Industries Inc*. N.p., n.d. 26 April 2016. <<https://www.vermiculture.com/news/today-i-found-out-10-very-interesting-worm-facts>>.
- "Urban Adamah - the Jewish Sustainability Corps." *Urban Worm Composting*. N.p., n.d. Web. 26 April 2016. <<http://www.urbanwormcomposting.org/>>.
- "Worm Facts." *Tumbleweed*. N.p., n.d. Web. 16 April 2016.
<<http://www.tumbleweed.com.au/WhyRecycle/WormFacts.aspx>>.