Vermi-Composting – My Experience

Worms have played a more important part in the history of the world than most persons would at first suppose.
Charles Darwin
The Formation of Vegetable Mould through the Action of Worms (1881)

What and Why?

Vermi-Composting is the process of composting many vegetable products with the assistance of worms. In the process worms grow, reproduce and generate worm castings and your waste load decreases.

Vermi-composting really excels at doing three useful things at the same time.

1. It allows vegetable matter to be composted year-round (vermi-composting);
2. It provides an optimal living and reproduction environment for earthworms (vermiculture);
3. It concentrates a soil building process by generating and collect worm castings (vermicast).

The most common worms that are used are:

- Red Wrigglers (*Eisenia fetida*) worms if you are going for fast composting.
- Night Crawlers (*Lumbricus terrestris* or *Eisenia hortensis*) if you want garden, fishing, feeding worms.

Red Wrigglers reproduce very quickly (about 90 days per generation). Given a starter (see below) it is not uncommon to quickly increase the number of small worms in your box.. Red Wrigglers also like higher temperatures and are known to be active in cow dung piles that are steaming due to the decomposition heat generation going on. Red Wrigglers can be purchased locally or on-line but only in select locations.

Night crawlers can take a year to reach maturity and only usually lay eggs in spring and fall. They can live from 4-10 years. They grow slower but are available to be picked off lawns, fields and roads in the early mornings or after overnight rain storms. These worms like cooler temperatures and move up and down through the soil and the vermi-composter all the time. I collect Night Crawlers from my garden and street. I place them into a peanut butter jar I have prepared with holes on the top and a dozen clean wet leaves inside. When I have enough (or want to), I dump the jar and contents into the box to add to what is already working there.

Vermi-Composting Bin

A plastic bin of the dimensions approximately 1.5'x2'x1' (0.5m x 0.7m x 0.4m) is a good portable size. A lid with holes that is fairly tight fitting also helps keep errant worms from escaping. Know that the contents of the box are going to be wet. As feed materials are placed inside it gets progressively heavier.

At the end of a cycle the box will weigh between 20-30 lbs (10-15kg). The holes are necessary to allow sufficient exchanges of oxygen and carbon dioxide as generated by the worms and the decomposition process.

The box, when ready and working, should be placed in a cool dark location. The colder the location the slower that processing will occur but some species of worms do not like higher temperatures (50+F)

Start-up

I start/re-start a box by putting in 1-2 full shovels of clean soil/dirt free of insects, pests, seeds and bulbs. These can be taken from a garden's poorest soil or from plant pots/boxes that are depleted soil and are being refreshed.

I add dry shredded paper, newspaper or vegetable inked paper (not glossy or treated papers). I will also add a few leaves and grasses being sure to not include ants, beetles, centipedes or cut worms. The real soil and the leaf and grass materials does a good job to seed the box with microbes but you don't want predators.

To this dry mixture I add enough water so that the entire mixture is moist but a little on the dry side (if it is still too dry later you can add water).

If you have some castings from a previous iteration these can now be added to the mix. Add worms either as found or as a seeding group from a previous iteration. I like to have anywhere from 40-60 Night Crawlers into my box for the winter period. The box could support up to 100 but the feeding regimen would necessarily be more.

Place a plastic trowel in the box to make processing more convenient.

Feeding

You want to feed the worms what they can consume. If they have too much then you may start to have issues with smell and fruit flies which can be unpleasant. How much food you put in depends on the type, number and size of worms you have. Be prepared to adjust how much you feed them as things progress. Know that your worms will be growing, they will be reproducing , and the container will generate some heat of its own through the decomposition processes you are encouraging. These factors increase the rate of food consumption.

Big chunks of vegetable matter should be cut smaller to facilitate their breakdown but this is not an absolute necessity. The food going into the container will first start decomposing through microbes and then the worms will be attracted to it.

- DO NOT FEED – Potatoes, Onions, Peppers, Citrus or Dandelion. I have read that these should be avoided and so I have.

- DO add, once or twice a week:

- Carrot, parsnip, beet, squash … and their peels (cooked or raw),
- Pea, bean, asparagus … trimmings,
- Fruit peels (Banana, apple, pear, kiwi,…)
- Melon peal (NOTE: that these are VERY wet and will add water to the vermi-composter.)
- Coffee grounds and Tea leaves (after use)

Place the vermi-composter food into a pit dug into the soil/vermicast and cover over with the next pit soil/vermicast. Be careful in pushing down the trowel not slice or chop worms that are present. I minimize this chance by moving the pit around the outside of the box. I can push my trowel down the side of the box knowing that worms cannot be there. If you get all the way around to the starting pit area and previous food it is not gone then don't add more and allow 1-2 weeks for the worms to catch up.

Tea leaves and coffee grounds can be just placed on the surface. The worms will come to the surface and pull these down as they wish. Bananas and soft fruits should be placed deep in the soil and covered well otherwise fruit flies will be a problem that really cannot be dealt with except to re-start a box.

If the box contents are getting very wet (the bottom 1 cm + of the soil is soggy or full on mud) then add dry shredded newspaper, or shredded vegetable inked paper or dry leaves. This soaks up the water and provides additional material for the worms to eat.

Worm Harvesting, Worm Castings Collection and Box Cleaning

Each 4-6 months the box should be emptied, rinsed and dried to ensure a clean healthy re-start. To do this I put the box in the sun and allow the sun to warm the worms and castings inside.

Casting Collection

After 30 minutes I scoop off a couple of inches of the castings. I repeat this cycle 2-5 times as necessary collecting the worm casting black soil. Note that this soil is tremendously enriched with plant nutrients to the point where it must be either used sparingly or diluted within pots, gardens or lawns. A couple of scoops from the second plus layers should be kept separate to use as starter for the refreshed box. Within these scoops will be a large number of deposited eggs ready to become another generation.

Worm Harvesting

The process of waiting time between scooping actions is to allow the worms to move down to lower levels away from the sun and the warmth. This concentrates the worms for harvesting. In concentration then start tapping gently on the side of the box and many worms will pop to the surface thinking that they are getting away from moles. Also concentrated scoops of the remaining soil will have high numbers of the worms that you can now select or separate fairly easily to containers for fishing, feeding, as starters for the next re-start or return to a summer garden.

Box Cleaning

A strong rinse with a garden hose, drying in the sun for an afternoon does just fine. That done you are ready to start again.