

Vermicomposting: A Better Soil Amendment

by Arnold Mercer

Vermicomposting is a process that relies on earthworms and microorganisms to help stabilize active organic materials such as food scraps or food waste and convert them to a valuable soil amendment and source of plant nutrients.

It is highly beneficial to the environment by keeping food waste out of landfills. Vermicomposting produces worm castings (poop), which are rich in nutrients and microbes and very beneficial to plants. The process is simple and can be done in the house year round resulting in a significant reduction in the amount of garbage for pick-up.

Food scraps are the second largest component of municipal solid waste (MSW)—paper and paperboard are first. The U.S. Environmental Protection Administration reported that in 2013, 37 million tons of food scraps were generated, or 14.6% of total MSW. Of that, only 5% or 1.84 million tons were recovered leaving 35.2 million tons to wind up in landfills. The decomposition of organic matter in landfills produces methane, a greenhouse gas twenty times as potent as CO₂.

Studies have shown that worm castings, when used as a soil amendment, improve germination and growth rates of flowers and vegetables and suppresses a wide range of insect pests. Researchers at several universities have conducted experiments which show the effectiveness of this material.

The Ohio State University reported that vermicomposts "...have a high and diverse microbial and enzymatic activity, fine particulate structure, good

moisture-holding capacity, and contain nutrients such as N, K, P, Ca and Mg in forms readily taken up by plants... The crops tested include petunias, marigolds, asters, and chrysanthemums but there is little doubt that they will also increase growth of other greenhouse crops. In most of our greenhouse experiments, we have substituted vermicomposts into soil-less growth media and vegetable crops tested in the greenhouse and field include: tomatoes, cucumbers and peppers. Fruit crops tested in the field include strawberries, raspberries, and grapes; all with very significant effects on yields independent of nutrient availability."

Similar tests conducted at Washington State University on marigolds and carrots reported increased germination and growth rates.

The Ohio State researchers' experiments "...demonstrated suppression of a wide range of plant pests by vermicomposts and 'teas'. These include biting caterpillars, beetles such as cucumber beetles, and sucking arthropods such as scale insects, medley bugs, aphids, and spider mites. The vermicomposts not only make the plants less attractive to pests but also decrease their reproductive rates. Vermicomposts also suppress plant pathogens such as *Pythium*, *Rhizocronia*, *Plectosporium*, *Verticullium*. We have also recorded very significant suppression of plant parasitic nematode populations and nematode crop damage."

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These results were obtained using a mix of 20%-40% vermicompost with the planting medium. A compost "tea," made by soaking vermicompost in water, was used (see reference at end of article).

Getting started with vermicomposting is simple. Start by modifying and using a plastic tub or tote or buy a ready-made composter (see links below). An important consideration is where to locate the composter—any area where the temperature in the composter bedding is kept in the range of 55°F. to 75°F. A properly maintained composter will not have an offensive odor.

The next consideration is a suitable type of worm. The preferred species is *Eisenia fetida* or red wiggler. The worms will consume almost any type of food-vegetable and fruit scraps, bread, pasta, coffee grounds—and paper, cardboard and dry leaves. Salty foods, oils, fats, meat, and dairy products should be avoided because their decomposition can result in unpleasant odors and attract vermin.

Information about the benefits of vermicomposting, getting started, and sources of composters and worms can be found at the following websites:

Vermicompost research:

<http://wiggelfarm.com/worm-casting-information/>

Getting started and sources:

<http://lancaster.unl.edu/pest/resources/vermicompost107.shtml>

<http://www.naturesfootprint.com/>

<http://unclejimswormfarm.com/?gclid=C N6Cscu40ccCFdUUHwodmgUIzg>

Compost Tea: <http://www.compostjunkie.com/compost-tea-recipe.html>