

Worm Composting: Vermiculture



The “black-gold” worm castings are effective, inexpensive, and organic sources of nutrients for lawns, trees, perennials, annuals, vegetables, and potted plants. Fertilizer made from worm recycled kitchen scraps is

Good for the garden!

Good for the planet!



photo by MEMGV

Composting with kids is a fun, environmentally friendly way of encouraging youngsters to learn about worms and recycling in nature. When kids compost, they become more aware of food they waste. Worm composting offers many valuable ecology/biology teaching opportunities!

Worm composting also known as **vermiculture** uses worms, as well as microorganisms, to break down organic waste and convert it into **castings - opulent, slow-release organic compost** that is rich in plant macronutrients—nitrogen, potassium, and phosphorus (N-P-K)—and micronutrients. Unlike hot composting techniques, worm composting works at normal temperatures and with minimal materials and effort. The worms do all the work of turning and digesting kitchen scraps, churning out finely textured, nearly odorless castings in a fraction of the time compared to other composting techniques. This technique offers an environmentally friendly, cost-saving method to recycle kitchen scraps into a soil amendment that not only feeds your plants, but increases a plant’s ability to fight off diseases and harmful fungi, makes soil resistant to compaction and water runoff, and buffers soil pH making it easier for roots to absorb nutrients.

Worm composting bins can be housed indoors or out. Bins can be made with any container. Healthy living environments for the worms require a dark, moist container with air holes. The easiest container to use is a 16 to 20 gallon plastic tote. A few 1/8” air holes, drilled about 2” apart into the lower sides, add adequate air flow. The location for the bin needs to have moderate temperatures, no hotter than 90°F, no cooler than 40°F. The ideal location could be a garage, crawl space, classroom, or even under a sink!

Bedding material for the bin may be shredded or torn newspaper, office paper, cardboard, or leaves or a combination of these materials. Paper with colored ink is not recommended. Thoroughly wet the bedding material(s), and then squeeze out excess moisture. Loosely place bedding in the bin. Initial additions of small amounts of soil, sand, leaves, saw dust, or ground egg shells give an added boost to the process.

Two types of worms can be used: Red Wiggler, *Eisenia foetida*, or the Brown Nose Worm, *Lumbricus rubellus*. These particular worms may be obtained from bait-and-tack shops or other commercial sources, even online. Worms double their population every 90 days, so the initial purchase of worms could be your last! Place the worms in the middle of the bedding, not just on top, and cover with a breathable cloth, such as black landscape cloth, or a solid piece of corrugated cardboard. The worms will not “escape” as long as the bin is hospitable and food is available.

Add food! Worms enjoy fruit and/or vegetable scraps - fresh, raw, cooked, or half rotted! Favorite foods include tomatoes, lettuces, melon rinds, banana peels, and potato and carrot pees. Crushed egg shells, coffee, and tea leaves (even the bag; however, remove any staples) can also be added. Do not use any oils, fats, meats, fish, cheese, or animal products. Add only an amount of food that the worms are capable of eating. Postpone adding more, until the initial food is consumed.

Worm Bin maintenance is minimal. Add bedding as necessary, and check that the bin is always on the moist side, neither wet, nor dry. A weekly check and gentle stirring will assure the worms are propagating, eating and composting. Baby earthworms look like adults only smaller and lighter in color. Egg sacs are round and golden brown.

Castings are ready for harvesting in two to three months. Collect the rich, dark brown castings from the worms in a couple of different methods.

One way, taking approximately one to two weeks, is to give new food on one side only, enticing the worms to navigate to the food side, leaving the castings to be removed from the other side. This method may be facilitated by actually moving all the worms and compost to one side of the bin and placing new bedding and food on the other.

Another harvesting method is to pour the entire contents of the bin onto a tarp or large piece of corrugated cardboard that is placed in the sun. Natural heat and light will cause the worms to burrow and the castings can then be removed from the top. A refreshed bin can then begin with the rescued worms.

Vermiculture Resources:

NC Extension on Vermicomposting www.bae.ncsu.edu/topic/vermicomposting/index.html

NC Extension Composting A-Z go.ncsu.edu/compostingA-Zhandout

Vermiculture AKA Worm Composting mastergardenersmecklenburg.org/vermiculture-aka-worms

Worm Composting Basics from Cornell compost.css.cornell.edu/worms/basics.html

Clemson Extension on Worm Composting www.clemson.edu/extension/hgic/plants/



**Mecklenburg
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NC COOPERATIVE EXTENSION



Composting at Home

TOP COMPOSTING TIPS

Choose a well-drained site that's level, in partial sunlight, protected from the wind, and near where the compost will be used, but not too close to trees or on slopes that drain to surface water.

For HOT composting green materials provide a source of nitrogen while brown materials like leaves provide carbon for the decomposing organisms.

A small amount of nitrogen fertilizer or green (or raw) manure can be added if needed to supply extra nitrogen.

Keep the pile moist for adequate microbial activity, but not wet. Soggy piles encourage the growth of organisms that can survive without oxygen and cause unpleasant odors.

Provide aeration either by turning the pile or by using bins that allow air to enter the pile.

Do not compost pet waste that can contain diseases. Do not compost meat, whole eggs (egg shells are permissible) or dairy scraps that can attract unwanted insects or wildlife.

Be patient composting is not an exact science. The rate of decomposition will vary depending on weather conditions and the materials composted.

Yard waste makes up 20% of our landfills and exacts a financial and environmental toll on our communities. Composting offers an ecofriendly, cost-saving solution allowing us to recycle yard waste back into our yards to the benefit of our environment, our gardens, and our budgets. Compost is the product of controlled biological decomposition of plant materials such as grass clippings and leaves into an organic soil amendment. For centuries, gardeners have used compost as a source of organic matter that improves the chemical, physical, and biological characteristics of soil and provides essential nutrients for plant growth. Compost can also be used as mulch to conserve moisture, control weeds, reduce erosion, and improve garden appearance.

A cold or passive compost pile can be started by simply piling yard debris in a heap on the ground. No specific amount of material is needed; additions can be made at any time. This is the slowest composting method. Decomposition compresses the pile and after a year or longer and compost at the bottom of the pile should be ready for garden use.

Hot or managed composting is designed to decompose material much faster and destroy weed seeds and disease organisms in the process. A hot pile must be built at one time so adequate materials for its construction may have to be stockpiled. Separate greens (grass clippings, coffee grounds, plants, fruits, vegetables, and moist items) and browns (dry grass, leaves, brown paper bags, and dry items), being sure to shred materials like leaves and bags so they don't mat. A hot pile should be at least 3' x 3' x 3' (one cubic yard) big enough for heat-generating microbes to work efficiently yet small enough for ease of turning to aerate. Piles can be larger, but piles over 2 cubic yards are hard to turn by hand.

Start the bin with an 8-12" layer of the coarsest browns. Spray lightly with water until moist, but not wet. Add a 2 - 4" layer of greens and moisten. Add a thin layer (1/4") of garden soil or compost. Continue layering up to at least 3' ending with a brown layer. As the pile cooks it reaches 130°F-160°F. Turn the pile when it begins to cool (about every 2 weeks); use your hand to determine if the pile is too hot to touch; if so, the pile is not ready to turn. A well-managed pile under warm conditions should be "finished" in about 2-4 months.

Find & share "Vermicomposting/Composting at Home" pdf GROW GUIDE
mastergardenersmecklenburg.org/soil-compost

Finished compost is pleasant smelling & crumbly to the touch like rich garden soil. The original ingredients are no longer recognizable.



Compost working here photos by MEMGV

Many styles of compost bins that help contain the pile and hasten the process can be purchased or made. You can build a simple bin with a hoop of wire mesh to contain the waste and allow air to enter from all sides. More substantial bins are also easy to build.

Resources for Composting & Bin Building

NC Extension Gardener Handbook: Composting content.ces.ncsu.edu/extension-gardener-handbook/2-composting

NCSU Home Composting
www.bae.ncsu.edu/topic/composting/backyard/

NC Department of Environmental Quality: Composting Basics
deq.nc.gov/conservation/recycling/composting/composting-101/composting-basics

Building your Own Composting Bin: Designs for Your Community

www.bae.ncsu.edu/topic/composting/pubs/build-bin.pdf

Home Composting: A Guide to Managing Yard Waste from UK Extension

www.ca.uky.edu/agc/pubs/ho/ho75/ho75.pdf

Garden Recycling Yes, No, Yes, No, YES!
mastergardenersmecklenburg.org/garden-recycling-yes-no-yes-no-yes

Compost Happens! mastergardenersmecklenburg.org/compost-happens

Research-based, how-to garden information visit:
www.mastergardenersmecklenburg.org

Mecklenburg Extension Master Gardener HELP DESK

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