



Vermiculture and Earthworms in our soil.

Earthworms are a beneficial part of the soil. The deep burrows of earthworms create passages for air, water and roots. Burrows provide easy avenues for the exchange of soil gases with the atmosphere. Clay soils with extensive earthworm burrows will allow water to infiltrate and percolate more readily than those without. Plants have the capacity to root deeper and the lower layers of soil can recharge with air more quickly. Air is an essential component of root development. Worms mix the soil as they create their burrows and build soil organic matter and humus as they drag litter into their burrows and excrete castings in the soil. Worm burrows contribute to soil tilth, tying together many of the large pore spaces in the soil and increasing soil porosity. The mucus from the skin of earthworms aids in the formation of soil aggregates, which are integral components of the crumb of soil structure. Aggregates are also formed in castings.

There are three types of earthworms:

1. **Anecic**, which are deep-burrowing (up to 6 feet deep!), dragging organic matter deep into the soil. Anecic earthworms can be 14 inches in length! This is what most of us would call “Nightcrawlers” (*Lumbricus terrestris*).
2. **Endogeic**, work in the more shallow, mineral-rich depths of the soil. They live their entire life in the soil, usually invisible to us, though they may rise to the surface during heavy rains.
3. **Epigeic**, who live in the surface of the soil, feeding on litter and organic matter on the soil surface. These are commonly known as “Red Wigglers”, and are commonly used as composting worms.

Earthworms breathe through their skin and must be in an environment that has at least 40% moisture (at least as damp as a wrung out sponge). If their skin dries out, they cannot breathe and will die. Instead of teeth, earthworms have a gizzard like a chicken that grinds the soil and organic matter that they consume. They eat the soil microorganisms that live in and on the soil and organic matter. Worm excrement is commonly called worm casts or castings. These soil clusters are glued together when excreted by the earthworm and are quite resistant to erosive forces. Their castings contain many more microorganisms than their food sources because their intestines inoculate the casts with microorganisms.

Earthworms will not go where it is too hot/cold or too dry/wet. Soil temperatures above 70°F or below 40°F will discourage earthworm activity. This is very important. For this reason, it is counter-productive to add earthworms to your outdoor compost pile. A hot-compost pile can (and should) reach 120° or greater in the compost process. Adding earthworms to those temperatures will simply kill the earthworms.

Providing a food source in the form of organic matter is also important. Mulching grass clippings into the lawn, putting down a layer of organic mulch in beds, amending the soil with compost, and turning under a green manure are all excellent ways to feed earthworm populations.

In the soil, it is possible to damage earthworm populations through improper soil management or the use of certain chemical applications. Tillage destroys permanent burrows and can cut and kill worms. Fall tillage can be especially destructive to earthworm populations. Deep and frequent tillage can reduce earthworm populations by as much as 90%. It is also important to understand that chemicals fertilizers, pesticides, and herbicides have an impact on the population. Earthworms can be harmed by high rates of Ammonium Nitrate fertilizer, high salt environments, and as shown in the table below, by some pesticides/herbicides:

Pesticide	Toxicity to Earthworms	Reduction
Sevin (carbaryl) insecticide	Severe	76-100%
Diazinon insecticide	Moderate	26-50%
2,4D herbicide	Low	0-25%
*Study from University of Kentucky Department. of Entomology		

Earthworms for composting – There is a way to employ earthworms to create compost for you. The process is called “Vermicomposting”, and it can easily be done at home. The most effective earthworm for composting is sometimes called a “Red Wiggler”, or *Eisenia fetida*. These worms are used because they are Epigeic, or worms that live in surface soil and litter. This means they will be active in the shallow depths of a worm compost bin. They are also very aggressive eaters who reproduce readily, producing lots of worm castings in a short period of time. There are many commercial worm “bins” that you can use for composting, The Natural Gardener sells the Worm Farm model vermicomposting system, but there are many other commercial and DIY setups. Regardless of the way you wish to begin worm farming, please remember; Worms, especially the composting types, want a temperature range of 40°F to 70°F (5°C to about 25°C). The worms will not be productive (or may die) outside of that temperature range. This is usually best accomplished by keeping the worms and their composting bin inside your home. For more information, check out “Worms Eat My Garbage” by Mary Appelhof. It’s a great read for any age, with clear explanations and thorough information on how to use worms to compost your scraps and create lots of excellent castings for your soil.¹

Earthworms!

These companies sell earthworms for vermicomposting. We do not guarantee these companies, but we would like to hear from you if you have a complaint or compliment

Company	Location	Phone
Brite Ideas	Austin, Tx	512-444-2100
Rockin Jaw Rabbits (rockinjaw@yahoo.com)	Richland, Tx	903-362-1740
Down to Earth Farm (downtoearthfarm.com)	Evant, Tx	254-471-5886
TexasWormFarm.com	Georgetown, Tx	800-528-6502

¹ Most of the information above comes from Colorado State University’s Master Gardener Program and the CMG GardenNotes #218