Earthworms & Their Benefits

Earthworms are one of the most important to gardening. The worms you will most likely run into is a species of Aporrectodea, Eisenia or Lumbricus, unfamiliar generic names for the most familiar of the thousands of earthworms common to good garden soils. Pot worms for instance, are much smaller than the traditional garden earthworm, only a few centimeters to a few millimeters in length; they succeed and replace earthworms in acid forest soils, which earthworms shun. An acre of good garden soil contains approximately 3 million live earthworms which are enough to do a bulldozer's amount of work and the earthworms are capable of moving approximately 16 tons of soil each year in search of food. The common compost worm (also known as a red wiggler) is native and is still the favorite with those who maintain worm composting bins. All earthworms have the ability to spread into new areas, survive and then multiply to huge populations. Although earthworms carry both sets of sexual organs, it takes two to produce offspring. Knowing this, it explains why they have such a large population. Earthworms are a powerful source in the soil and some people even believe that every particle of soil has gone through a worm at least one time. Their role in the soil is extremely important as earthworms are ultimately involved in the shredding of organic matter, the aeration of soil and particles as well as helping movement of OM through the soil as well as increasing microbial populations. An earthworm eats bacteria, fungi, nematodes and the OM in which these organisms live. Vermicastings are at least 50% higher in OM than soil that has not passed through earthworms which in turn radically changes the composition of soil, increasing CEC due to the greater amount of charge holding organic surfaces. In addition, the earthworm digestive enzymes unlock many chemical bonds that would otherwise be tied up nutrients, preventing availability for plants. Vermicompost also has 6 times the available potash, Three times the usable Magnesium and five times the Nitrogen. All these nutrients bind onto OM in the fecal pellets. Earthworms are also considered "Shredders" because as they search for food, they break down

the litter (leaf) in the garden which in turn open up leaves and other OM, thus giving bacteria and fungus better access to the cellulose and other carbohydrates and lignin – a non-carbohydrate in the (OM) = Organic Matter. Earthworms the facilitate the recycled nutrients back into the soil. So you can understand more clearly remember that leaves in the garden and/or lawn would normally require approximately two years to decay without worm shredding but only approx. four months with it! The end result of the worm shredding and digestion are minute particles of organic litter that microorganisims can eat. The microbial population in the soil is also enhanced because they are mixed into the worms fecal pellets during their formation and elimination which in turn, creates a protected enclave of fungi and bacteria.

Did you know that earthworms are incredibly strong? While making their way through the soil, earthworms can move rocks that are six times their weight. This is very important considering the amount of burrowing they do. Different kinds of worms make different kinds of burrows. Some are temporary and some are permanent. The temporary burrows are usually abandoned after they become filled with litter and castings. Roots then grow into these burrows and is able to penetrate deeper than it could without earthworms, all while having access to nutrients and the microorganisms that freed them.

Some earthworms move up and down in the soil sometimes as deep as 12' while others move horizontally rarely leaving the top 6 inches in the soil. Either way, the movements is akin to to delivering food to another area and impacts the entire population of a soil food web. Earthworms not only increase a soil's porosity, but by breaking down and mixing organics, they also increase its CEC. Remember that a couple of million of worms burrowing becomes pathways for water drainage and air passages and since they move vertically and horizontally through the soil, these pathways can bring water to all sorts of locations, whether put to immediate use by plants or stored, for later absorption.

In summary, there are so many benefits of earthworms:

- They shred debris so other organisms can more readily digest them

- Add fertility and OM to soils
- They break up hard soils
- They create new paths and help bind soil particles together
- They cycle nutrients and microbes to new locations as they work their way through solid in search of food

Rototilling or other ways of turning soil destroy worm populations by cutting them up into pieces that will not ever regenerate whole worms. Also, if you use chemical fertilizers, you are literally throwing salt on the wound because these chemicals are salts that irritate worms and actually chase them out of your garden. A noticeable worm population is a clear sign of a healthy food web community and means that OM, Bacteria, Fungi and Nematodes are all in place and that chances are that the other parts of the soil food web are in order as well.