Serious about Soil

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Nature Recycles

As Master Gardeners we should be aware that the condition of our soil is vital to the healthy growth of our plants. In general, soil consists of organic matter (derived from living organisms), mineral matter (inorganic), water, and air. Organic and mineral matters are the solids in the soil and may occupy up to 75% of the total soil volume.

Organic matter is crucial to plant growth because it:

- Contains nutrients and releases them at a rate that your plant needs them, thereby promoting optimum growth.
- Binds with the mineral matter to form small aggregates which improve soil texture and structure.
- Aids sandy soil by absorbing and retaining water that otherwise would wash through leaching out nutrients.
- Aids clay soil by loosening compaction and providing increased air capacity.
- Acts as an inoculant, adding microorganisms and attracting larger creatures, like earthworms and insects, which are nature's soil builders.
- Acts as a buffer against toxins in the soil.
- Retards soil erosion.

Natural plant growth uses up this organic material; therefore, it is important that it be replaced to insure proper soil maintenance. Nature has been taking care of this rebuilding process since the beginning of life on Earth by decaying any living organism that dies and falls to the ground. The result of this decomposition (compost) returns to the soil most of the nutrients that the living organism contained.

All of life is part of a continuing pattern that should not be interrupted. As human beings we reap things from the land, and giving back to the land is every bit as vital as taking from it. Compost is nature's best continuing effort to rebuild fertile, productive soil. Before the growth of civilization in Texas, the organic content of our topsoil was estimated to amount to about 20%. Today that organic content amounts to only ½ of 1% to 3%. We may never be able to offset the damage we have done to the soil and replace all that we have taken from it – but it's not too late to try to make amends.

COMPOST – HOW NATURE DOES IT

The importance of the vitality of our soil cannot be overemphasized when trying to maintain plant health. Taking care of the environment in which the root system grows is essential to growing productive plants and avoiding plant problems. Nature has been maintaining the vitality of the soil since the beginning of life on Earth through the process of the decomposition of organic material.

A basic understanding of the factors involved in this decomposition will enable us to become more successful backyard composters. A major portion of this decomposition is accomplished by microbes (single cell microorganisms), which breakdown organic matter into compost and eventually humus. Microorganisms such as bacteria and fungi release enzymes that breakdown complex organic compounds into simpler compounds, which they can absorb as nutrients. These microbes are primary decomposers and are but the first step in a food chain that are eaten by other organisms, until we can actually see decomposers such as maggots, pill bugs and earthworms (the ultimate composting machines).

These organic decomposers are liberators of the nutrients that allow plants to grow strong and healthy. These nutrients are so ideally adapted to plant needs that they are far better soil enrichers than human engineered fertilizers. Soil microorganisms are everywhere and could amount to as many as nine hundred billion in just one pound of fairly decent soil.

As living beings we require several things in order to exist, such as, food, water, air, and space in which to live. Obviously plants have these same basic requirements, as do microbes. These microorganisms only need four things to keep them satisfied and growing in their decomposing activities;

- Carbon is their primary food source. Since all organic matter is carbon based, it is easy to see how anything that was once living is fair game for their activities.
- Nitrogen is required as a protein source to allow these microbes to grow and multiply. Again all organic matter contains some degree of nitrogen.
- Water
- Air

All of these requirements are supplied in nature and in future articles we will see how we can imitate nature by promoting the faster decomposition of organic material in our backyards, with the objective of improving the vitality of our soil.

BACKYARD COMPOSTING OR LET IT ROT

In nature there is a cycle of life, growth, death and decay. Plants draw their needed nutrients from the soil and the air around them. As a plant dies, it falls to the ground where microorganisms decompose it (compost) and release the nutrients back into the soil where they will be available for other plants to use. Compost is the finest of all soil amendments.

The modern practice of composting is little more than speeding up and intensifying natural processes - and that's all it is. Finished compost is no more than predigested organic material which has undergone a natural rotting process and which is very

valuable "stuff" to incorporate into your garden's soil. Successful home composting is more art than science - it is not rocket surgery!

Back yard composting is a way of using up what we have in abundance - humble things like weeds, grass clippings, dead plants, and kitchen scraps. A large portion of household waste is composed of organic material and is compostable.

Soil microorganisms are what starts the decomposition process and they are everywhere! There can be as many as 900 billion microorganisms in just one pound of soil. In most instances we are looking for speedy results from our backyard composting efforts; therefore, it is to our benefit to encourage these existing microorganisms to grow and multiply as much as possible.

To provide these microbes with an optimum environment they will need the following:

- a food source for energy - carbon or brown "stuff"
- a protein source for growth - nitrogen or green "stuff"
- water
- air

Scientists have determined that the ideal compost pile mixture of carbon materials to nitrogen materials is 30 parts of carbon to 1 part of nitrogen. All organic matter contains carbon and nitrogen in some ratio so don't be concerned about whether you have obtained this ideal ratio because you will never know exactly what you have in your compost pile.

Water - from start to finish your compost pile should have the consistency of a wrung out sponge. Not enough water is the biggest problem in north central Texas.

Air - you cannot have too much air. One of the advantages of turning or stirring your pile is that you are reintroducing more air into it. Turning your pile more often than every third day will slow down the decomposition process!

When microbes start digesting carbon compounds, the carbon is literally burned or oxidized. Part of this oxidative energy is given off in the form of heat. That's how you know that decomposition is occurring. Temperatures of 165 degrees may be achieved; however, lower temperatures are more common and will produce finished compost, only slower. When you can no longer get the pile to heat up, the compost is essentially done and can be used.

Anything organic (once living) is fair game for composting; however, there are several things that you should not put in your backyard pile:

- Meat, fat, lard and dairy products will attract resident wild life to your backyard.

- Dog and cat feces contain harmful bacteria which will probably not be destroyed by the pile temperatures you attain.
- Seeds from noxious (your call) weeds.

Compost containers for your backyard pile are for your convenience only (the microbes couldn't care less). Factors that could influence your choice are convenience, cost, appearance, and durability, but be careful - many nice looking containers are sadly lacking in the other factors.

Remember, "compost happens"

- Don't get bogged down with complicated recipes and formulas.
- There are no hard and fast rules - just guidelines.
- Let common sense and your available organic materials be your #1 and #2 composting guides.