

## Good Gardens Start with Good Soils



*Photo to be credited to Clemson University Horticulture: Good soils start with thorough soil cultivation to break through compacted layers. A good mulch layer maintained around plants helps to maintain a healthy soil.*

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June 13, 2004

**G**ood soil is very important for most plants. Most of us know that soil is where roots grow and where they obtain both water and nutrients (chemical elements). It is also generally known that the dark stuff (organic matter) helps the plant. Beyond that, we seldom think too much about soil and how we manage it. But good gardens start with good soils.

Besides the aforementioned items, what does soil really do for a plant and how can we affect soil to help our plants do as well as possible?

A good soil will be alive with many organisms. This includes earthworms and many micro-organisms including bacteria and fungi. Roots should be very common in the upper layers of soil.

Surprisingly the biggest limiting factor to root growth and the organisms that live in soil is oxygen. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Therefore a good soil needs lots of porosity, space for oxygen. Actually a healthy soil is half empty pore space. This pore space is the area that holds water or air. You can tell a good soil if it feels a little spongy when you walk on it. I find this to be common in wooded areas that are well mulched or in well tilled gardens. Many grass lawns seldom feel this way as they often have highly compacted soils. They were either not prepared properly in the beginning or not managed well over time and became more and more compacted.

To make sure your plants are getting enough oxygen to grow well, you may want to test your soil's drainage. Drainage or percolation can be a good indicator of a soil's porosity or aeration. If a soil is well drained, it is usually well aerated; if it is poorly drained, it is poorly aerated.

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A simple test that can be done at home to test drainage is to take a 46 oz. tin can (such as the ones that contain tomato or pineapple juice) and remove both ends. Then mark a line two inches from the bottom of the can. Pound the can into the soil so that the mark near the bottom of the can is at the surface of the soil. Now pour one quart of water into the can and check the amount of time it takes to drain out. If it takes 2 or less minutes your soil is well drained. Two to 8 minutes is fairly drained, and 8 minutes or more is poorly drained. Having a poorly drained soil could mean that you live in a wetland. But usually it just means that your soil is compacted. A compacted soil doesn't absorb much of the rainwater and your plants are limited by lack of oxygen available to their roots.

It is fun to try this test in different areas of your lawn, such as turf areas, mulched beds, etc. You may find some surprising results.

If you have compacted soil what are your options?

Mulching around trees and shrubs and leaving the grass clippings on the lawn are ways to increase the soil's organic matter. You should never throw away any plant material such as grass clippings or leaves and pine straw. A soil rich in organic matter will have more organisms alive in it. Organisms such as earthworms will help increase the porosity of the soil. Better root growth also helps soil porosity.

Of course, avoiding compacting the soil in the first place is important. Don't do things like driving your car over places you wish to grow plants. Channel traffic, including frequent foot traffic and bicycle traffic, into specific areas so that you don't spread the compaction out to other areas.

It is amazing the cumulative effect we have over large areas by the way we manage our soils. There would be much less need for stormwater ponds if we all managed our soils better. Our plants would grow better too.

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