

## A Soil Primer

This is Julie Callahan bringing you information on shore friendly living and gardening from the Master Gardeners and Virginia Cooperative Extension. This week I will be talking to you about native plants and their benefits to wildlife and our landscapes.

Today I'm going to talk to you about soil. Soil is formed when rock is broken down by climate and vegetation over a period of time. It contains weathered rock fragments, organic matter, and varying amounts of air, water and microorganisms. Soil in good condition contains about 50% solid material and 50% open pore space. Most soil solids contain up to 48% minerals which are essential to health plant growth. Organic material makes up about 5% of volume. Ideally, soil pore spaces contain about 25% air and 25% water.

Most soils have four distinct layers, beginning with leaf litter on the top. The surface soil, right under the leaf litter, contains the most organic matter and is the most fertile. It is in this layer where plants obtain much of their nutrients and water.

The bottom two layers support the surface soil and may be considered the soil reservoir, providing storage space for water and nutrients for plants. These layers aid in soil temperature regulation, supply air for plant roots, and influence soil texture, fertility, rate of decomposition, and other qualities.

As mentioned, components of the soil include organic matter, water and air, and plant nutrients. Organic matter consists of the remains of plants and animals.

When temperature and moisture conditions are favorable, earthworms, insects, bacteria, and fungi use the organic matter as food, breaking it down into humus and soil nutrients. Humus is the portion of organic matter that remains after decomposition has taken place. Organic material helps develop good air-water relationships. In very sandy soil, this material takes up some of the space between the sand grains, binding them together, and increasing water-holding capacity. In a finely textured soil such as clay, organic material helps to loosen and aerate the soil to improve drainage.

Plants need 16 nutrient elements for normal growth. 95% of soil components come from four of these elements - carbon, hydrogen and oxygen (which come from the air) and nitrogen (which is in the soil). Although plentiful in the atmosphere, nitrogen is unavailable to the plants. This is where bacteria that live in the root nodules of plants such as clover play an important role. These bacteria are able to fix nitrogen from the air into a form available to plants. Most of the remaining 12 elements come from the soil and are usually present in sufficient quantities. Phosphorus, potassium, magnesium and calcium, however, are variable and may need to be adjusted based on a professional soil analysis.

From my home in Chincoteague, I recorded **xx** inches of rain this past week. For answers to Gardening questions call your local Accomack or Northampton County Extension Office.