



Soil

Soil is a mixture of air, water, living things (leaves and materials). Organic materials are formed when living decay. This organic material is called **humus**.



worms, etc.), organic and mineral things like plants and animals

Mineral material is made up of small pieces of rock that have been worn down over time by water, wind and chemical processes. The water and air that plants need to survive are trapped in the soil in little air pockets or pores.

The size of these pores is determined by the type of soil. There are three basic soil types: sand, silt, and clay. Sandy soils have large pores, silty soils have smaller pores and clay soils have the smallest. If the pores are too big, like in sandy soils, water will drain too quickly. The plant's roots won't have enough time to absorb the water and nutrients it needs. In clay soils, the pores are small and can't drain water easily. They can fill up with water and the plant won't get enough oxygen. The best soil is a balanced mixture of sand, silt, clay and humus, called **loam**. Loam allows the plant to get the water, oxygen and food that it needs.

Soil Texture

Texture is something you can feel. Sandpaper has a rough texture. Velvet has a soft texture. You can tell the different kinds of soil apart when they are wet by their texture and colour. Sandy soils are light in colour and feel rough to the touch, like sugar. Silt and loamy soils are dark and feel spongy to the touch, like mushrooms. Clay soils can be reddish or grey and feel smooth to the touch, like plasticine.

What is Fertilizer?

Fertilizer is a plant food that is used to help balance soil. Fertilizer has many nutrients. Three of the most important ones are: **Nitrogen (N)**, **Phosphorous (P)**, and **Potassium (K)**. All plants need these to live. Nitrogen helps plants to grow dark green, healthy leaves. Phosphorous helps build strong roots, protects against disease and helps the plant make seeds and flowers. Potassium also keeps roots strong and protects against disease. In addition, it helps green plants make food in their leaves.





Types of Fertilizers

Fertilizers can be **synthetic** (man-made) or **organic**. Synthetic fertilizers can be liquid, granular or powdered in form. On site, you may see bags of fertilizer that look like sacks of kitty litter; these are **granular** fertilizers. These fertilizers are spread on the ground, or they can be mixed into the soil. Once in the soil, they dissolve in water and the nutrients are absorbed by the plant roots.

Powdered and **liquid** fertilizers are mixed with water before they are used. Once dissolved, they work very quickly when they are applied. There are also **slow-release** fertilizers that work over a period of time. When you use synthetic fertilizers, you must follow the directions on the label exactly. If you use too much, you could burn the plant roots. Your supervisor will show you how to mix and apply them correctly.

Organic fertilizers are made from manure and other organic products. Some people make their own organic fertilizer from yard clippings and vegetable kitchen waste. This is known as **compost**. Organic fertilizers are not as harsh as synthetic fertilizers. You need to use more of them, but the risk of burning the plant and its roots is much less. Organic fertilizers can also improve drainage in soil and can help the soil get more air. For example, organic fertilizers help sandy soils hold more water. In clay soils, organic fertilizers can help break up the tight soil and allow the water to drain better.

Reading Fertilizer Labels

All fertilizer labels have three numbers printed on the front. The first number tells you the **percentage** of **nitrogen** (N), the second is the percentage of **phosphorous** (P) and the third is the percentage of **potassium** (K). There are other nutrients in fertilizers, but N, P and K are the most important.