BIO 403 SOIL ECOLOGY

LECTURE -1

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PHYSICAL NATURE OF SOIL - 1

Summary

This class will teach you the basic physical properties of soil and this are soil colour and soil texture.

Objectives

At the end of this class the students should be able to

1 list the physical properties of soil

2 Explain in details each of the physical properties of soil

3 Explain how this physical properties of soil promotes plant growth and development

Introduction

A functioning ecosystem is being influenced by the physical properties of the soil that is present there. This makes it important for us to understand the concept of soil physical properties. The physical properties of soil are being comprehensively addressed below.

Soil colour

Several colours can be found in soil which included, yellow, green, gray, white black, dark and bright colours. There are changes in soil properties as the soil layers changes. Although soil colour has little influence on the behavior, uses and function of the soil but it is still a very important factor to consider in soil study. A standard system for accurate colour description has been developed using munseu colour charts. In this system, a small piece of soil is compared to standard colour chips in a soil colour book. Each colour chip is described by the three components of colour which are the hue (in soils, usually redness or yellowness), the chroma (intensity or brightness) and the gray (lightness or darkness).

There are three factors that determine soil colour you must note

1 Organic matter content

2 Water content

3 presence and oxidation states of iron and manageress oxides

Soil texture

Soil texture explains the size of the particles the soil is made of. There are basically three types of this soil texture. They are sandy soil, loamy soil and clay soil.

Sandy soil: Sandy soil is formed from the fragmentation of rocks such as limestone, granite and quartz. It consist of small particles of weathered rocks. Sandy soil is poor for plant growth and development because of their poor water retention capacity which makes it hard for plants to absorb water. Sandy soil also have poor nutrients for plant growth and development.

Silt soil: This is made up of smaller particles than sandy soil and consist of rocks and other mineral particles. Silt soil have a higher water retention capacity than sandy soil. Silt has a floury feel when it is dry and a slippery feel when it is wet. Silt soil is easily transported in water and can even be carried around as dusts. Silt soil contain some nutrients that helps plant growth and can therefore be used for agricultural purposes.

Clay soil: Clay contain smaller particles than the sandy soil and the silt soil. It is made up of fine grained small particles. It is the heaviest and densest type of soil. It form plasticity when wet and become hard and brittle when dry or when they pass through fire. The particles in clay soil are tightly packed together which makes it difficult for air and moisture to penetrate. Because air and moisture cannot easily go through, it is poor for plant growth and development.

Loamy soil: The loamy soil is the combination of sand, silt and clay and the benefit of each of them resides in the loamy soil. The loamy soil has higher calcium and pH than the rest of the soil. It has good ability to retain moisture and nutrient which is the reason it is found highly suitable for agricultural purposes.