Roots

A. The Root System

The root system is that part of the plant which grows below the ground. It consists of roots which absorb water and minerals from the soil. The root, its branches, root hair and root cap together constitute the root system.

Functions of Roots

In order to understand the root system, let us understand its functions:

1. It absorbs water and minerals from the soil and transports it through the stem to the leaves.

2. It holds the plant to the soil.

3. It acts as a storage organ of food material in some plants.

4. It binds the soil together that it does not get washed away during rains or blown away by winds.

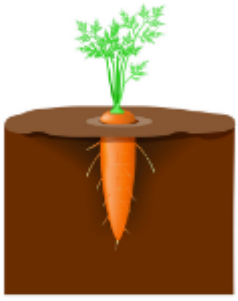
Roots

☞ Classification of Root System

The root system is classified into two types:

1. Top Root System

When a seed germinates, a single root grows downwards into the soil. It's branches grows into smaller lateral roots. Such an arrangement of root system is called the tap root system. The lateral roots grow deep into the soil and are even capable of enchoring large trees. The examples of this root system are plants like pea, mustard, bean and gram.



Taproot system
(a main root with smaller roots)

2. Fibrous root system

When a seed germinates, several roots grow out at the same time from the base of the stem. Such an arrangement of a root system is called the fibrous root system. The cluster of roots spreads out in the soil giving support to the plant. These are found in plants like maize, wheat, rice and grasses.

Fibrous root system
(many roots with similar sizes)

Roots

☞ Modifications of the Root

Some plants have special types of roots which perform special functions. Such roots are called modified roots. Let us study their special functions:

1. Roots modified for storage of food: Some plants like carrot, sweet potato, turnip and sugar beet have their roots modified for the storage of food. Their roots are swollen and fleshy due to the accumulation of food.

2. Roots modified for support: Some plants require additional support to stand erect.

For example, the branches of banyan tree get extra support with the help of rope like roots hanging down from the branches. These roots grow vertically or obliquely downwards and penetrate the soil. They act as pillars and prevent the long branches from bending downwards. Such roots are called prop roots.

Roots

☞ **3. Parasitic Roots:** Some plants such as dodder grow on another plant. Its roots arise from the stem and penetrate into the stem tissues of the other (host) plant. The roots absorb water and minerals from the host plant. Such roots are also called sucking roots.

☞ **4. Breathing Roots:** Many plants growing in salt lakes or in mangrove regions develop special kinds of roots called breathing roots. Such roots grow from the underground roots of the plant, but rise vertically upwards and come out of the water like conical spikes. Each of these roots has numerous pores or air channels through which the exchange of air takes place. Such kinds of roots arise because the soil in such regions is poor in oxygen content.

☞ **5. Climbing Roots:** This type of root system is found in climbers. Weak-stemmed plants like betel, black pepper and money plant produce roots from their stem nodes. These roots attach themselves to a support and climb. Such roots twist and clasp the support for giving extra support to the plant while climbing.