Roots

Introduction to Horticulture

PLSC 2100

Mr. Warnick

At the completion of this unit students will be able to:

1. List the functions of roots in plants;
2. Identify the parts of a root;
3. Identify the two major types of root systems; and
4. Recognize a healthy root system.

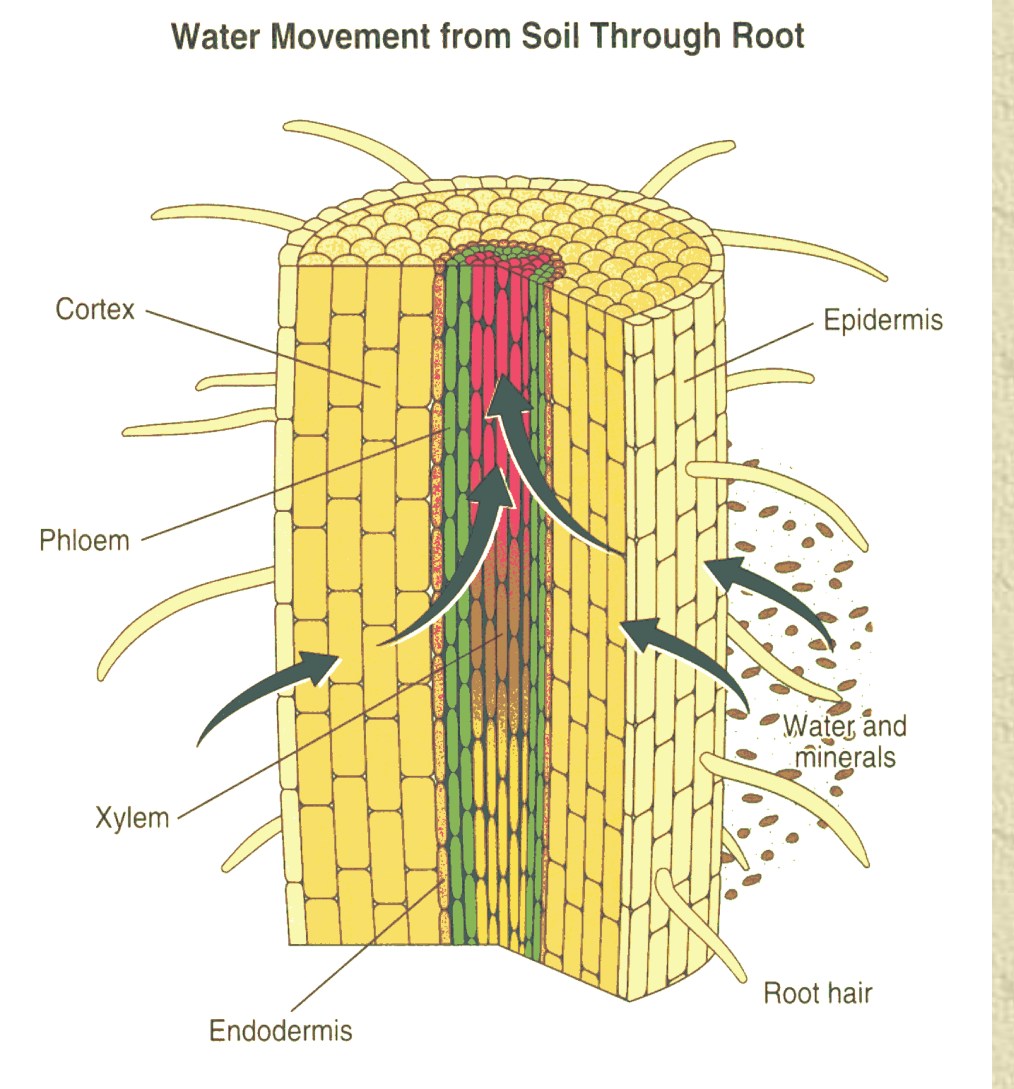
1. List the functions of roots in plants

- A plant's health is very closely tied to its roots. When roots are weak or diseased, the whole plant has difficulties. The roots need to be constantly growing in order to stay healthy. This is one reason that a plant growing in one pot for a long time tends to become rootbound.

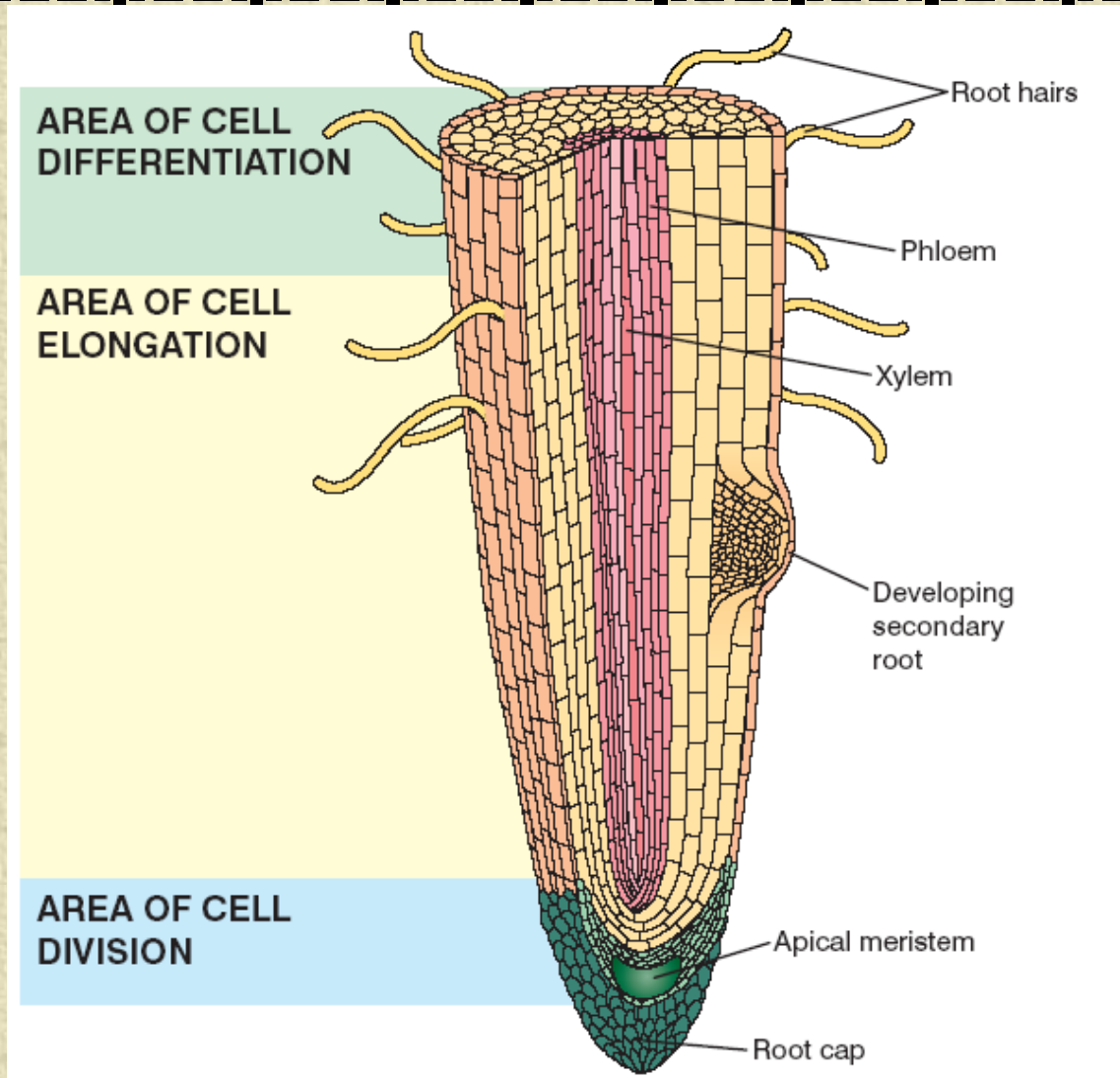
1. List the functions of roots in plants

1. Supports and anchors the plant
2. Uptakes all water and minerals needed for life
3. Storage of nutrients from photosynthesis need for later use

2. Identify the parts of a root

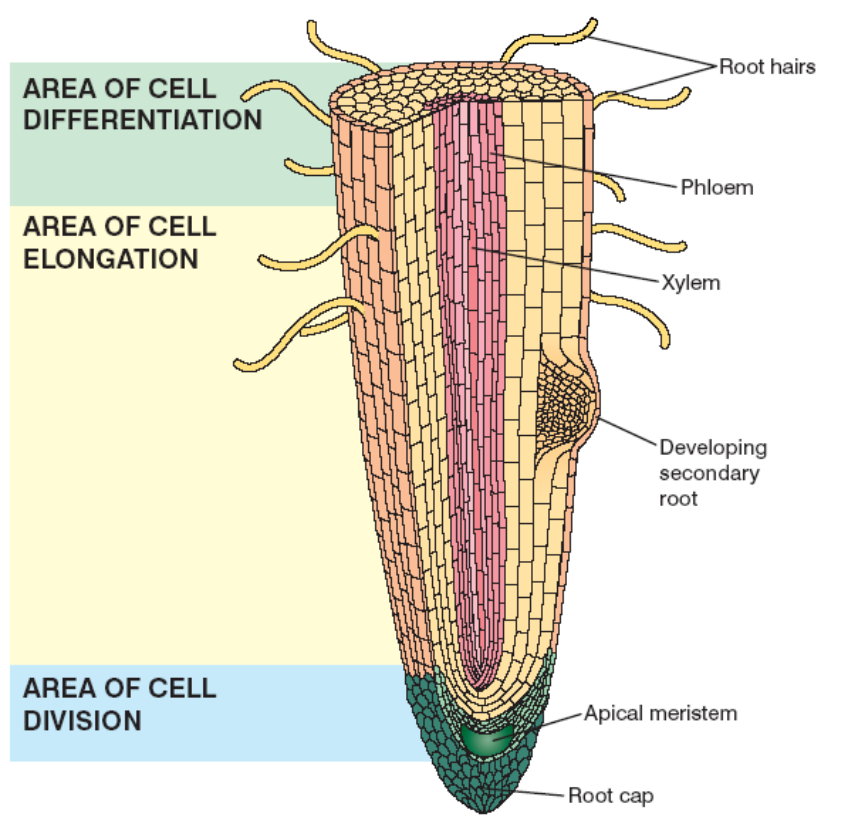


2. Identify the parts of a root



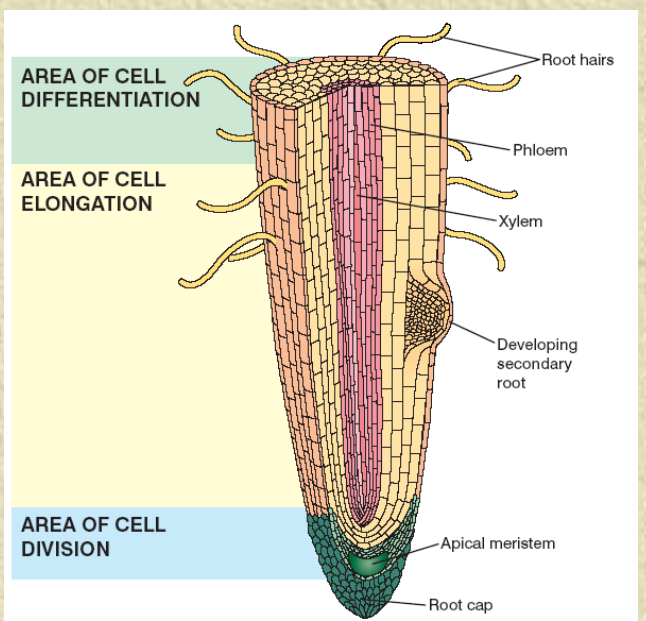
2. Identify the parts of a root

At the tip of the root, there is an area where new cells develop, called the ***apical meristem***.



2. Identify the parts of a root

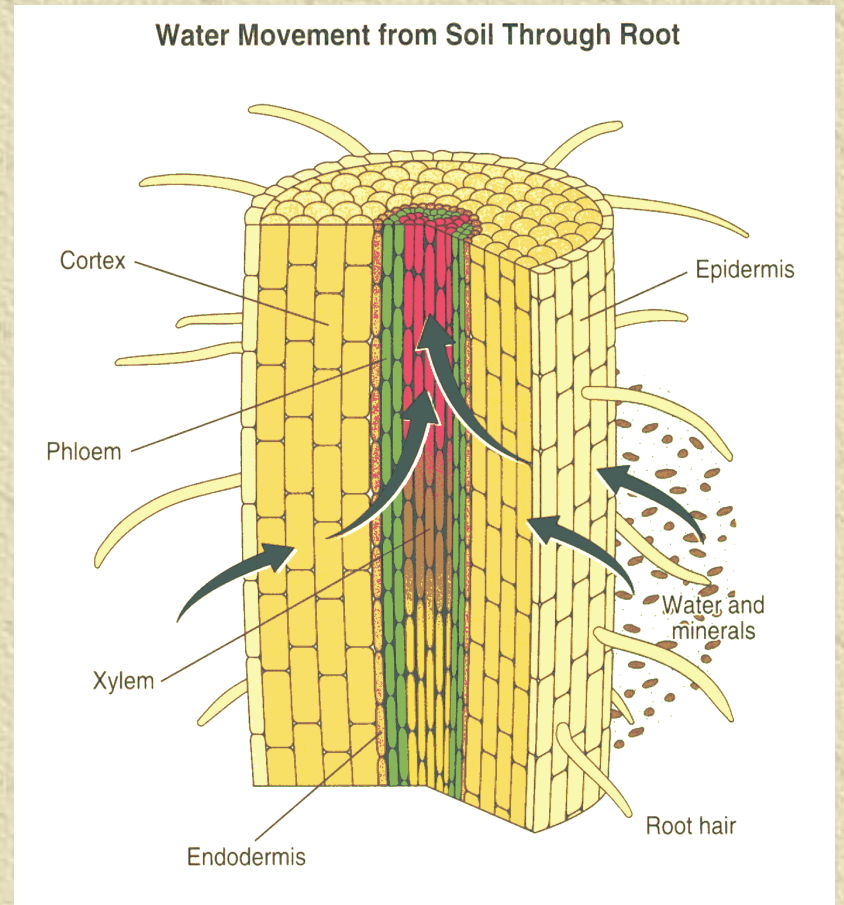
The apical meristem is easily damaged and so it has a ***root cap*** over the top of it to protect it from damage as it grows through the large and sometimes coarse soil particles.

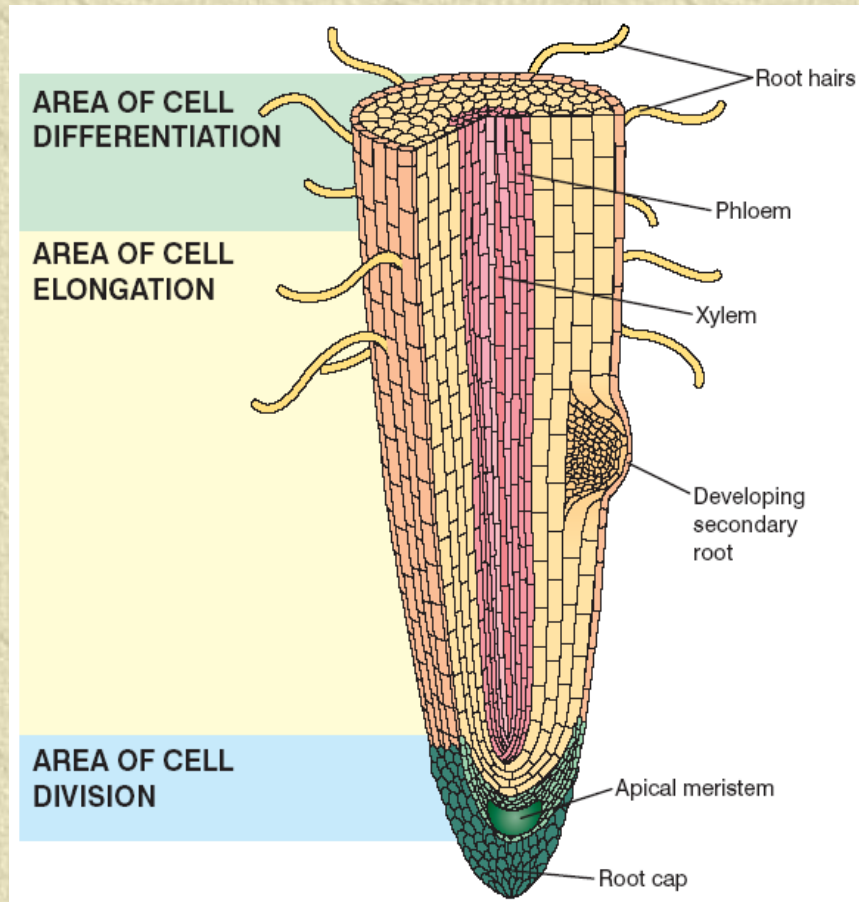


2. Identify the parts of a root

- The surface of the root is covered with a skin of cells called the ***epidermis***. This epidermis is where the water and minerals enter the root through osmosis and diffusion. The larger the surface area of the epidermis, the better able the plant is to bring in water and minerals.

2. Identify the parts of a root

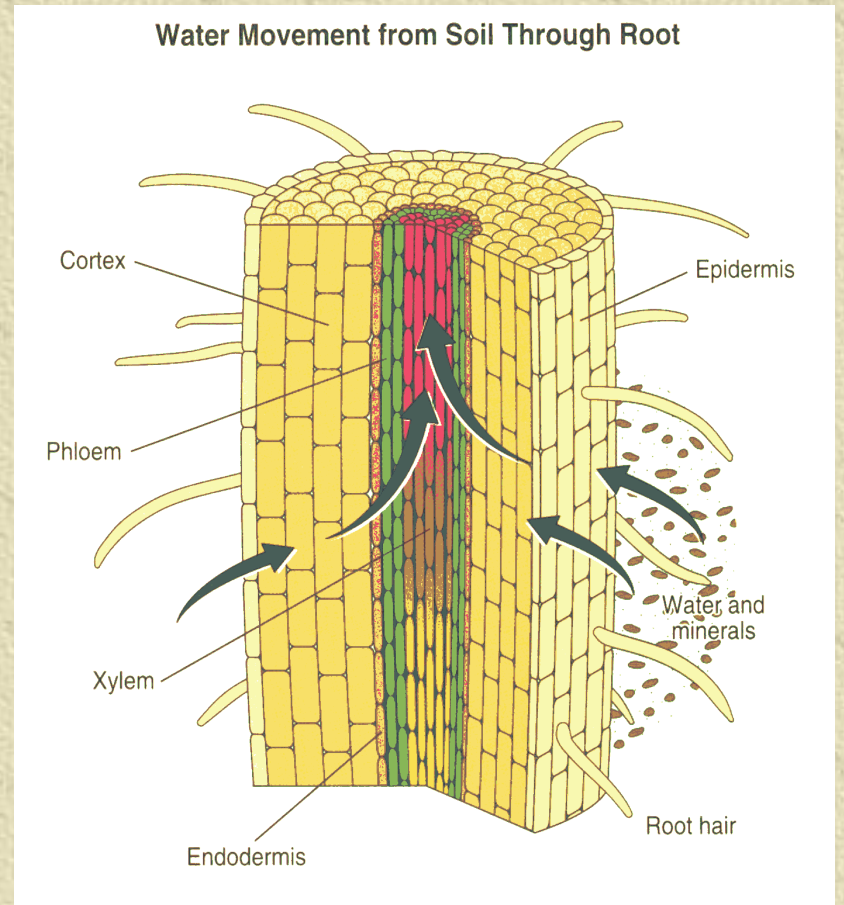


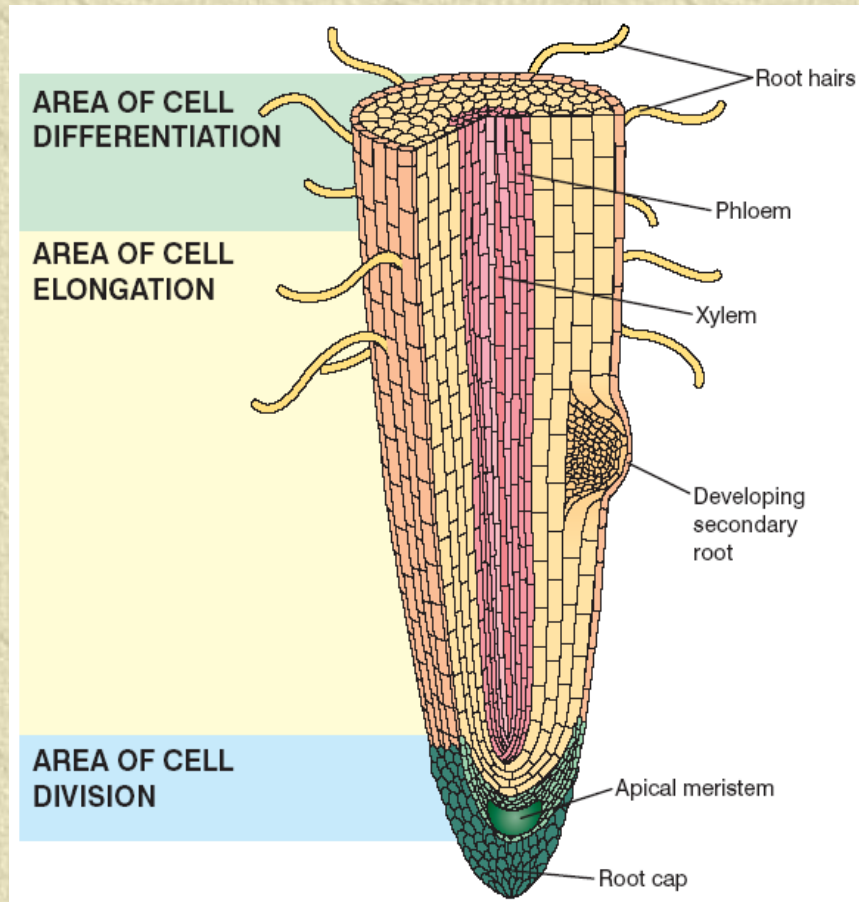


2. Identify the parts of a root

So, the epidermis cells begin to elongate and grow hairlike projections. These projections, called ***root hairs***, greatly increase the surface area of the root and allow much more water and minerals to enter the plant.

2. Identify the parts of a root





Absorption of water and minerals

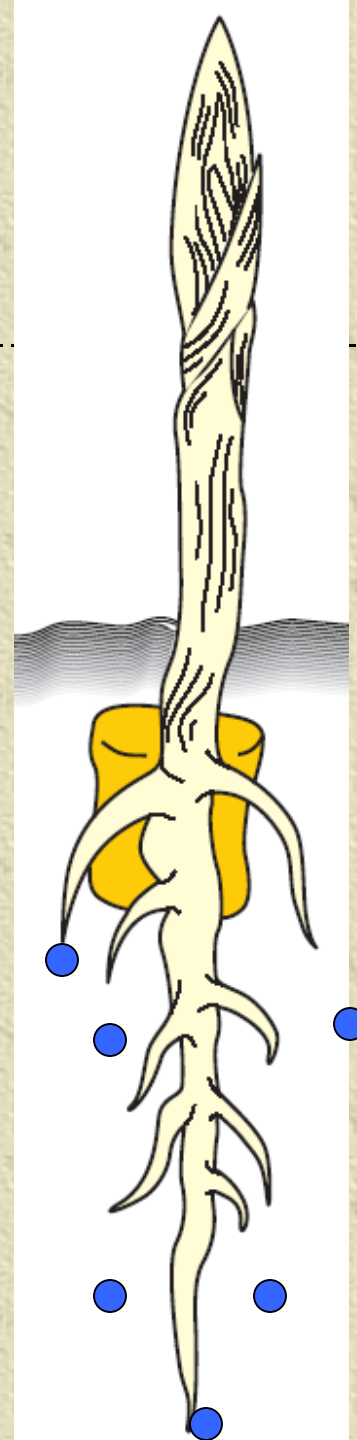
- **When the concentration of water is greater outside of the root cells than inside, water moves inside**

Xylem

- **Tubes that carry water and minerals from the roots to where photosynthesis will occur**
- **Xylem Up!!**

XYLEM

Water goes up

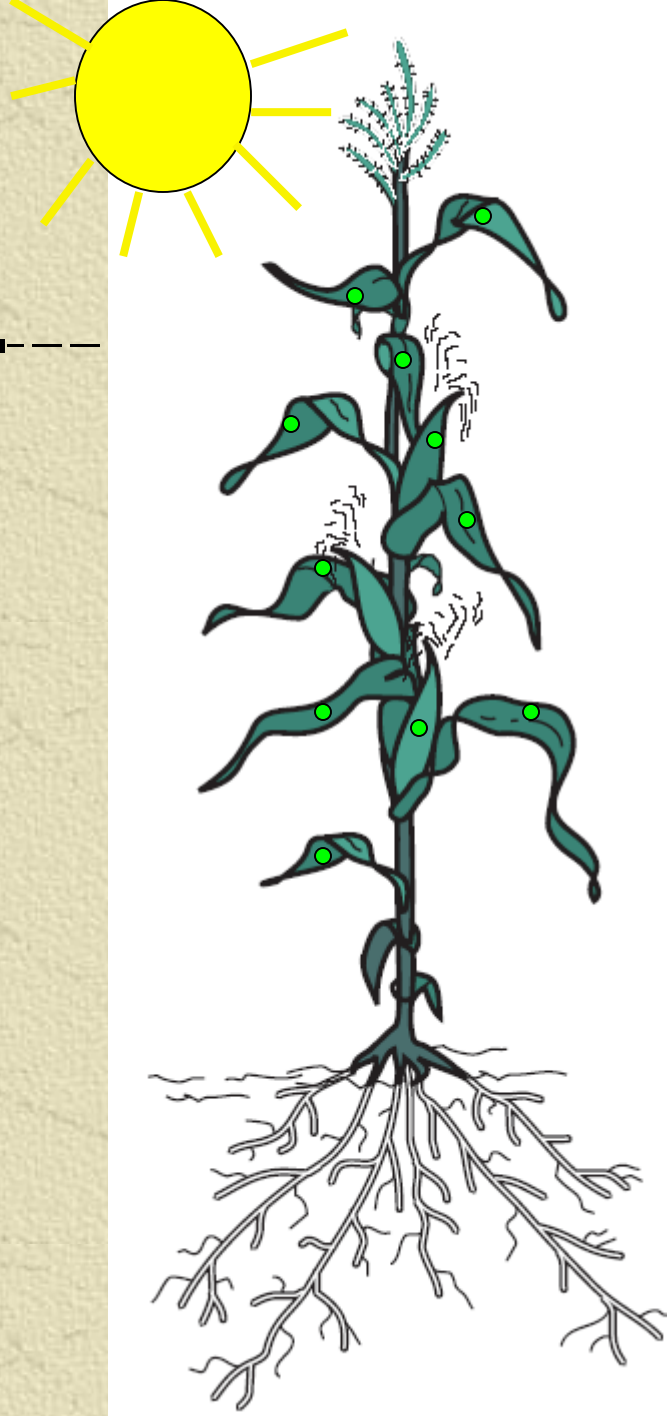


Phloem

- **Tubes that carry sugar to areas in the plant where it will be used or stored.**
- **Phloem Down!!**

Phloem

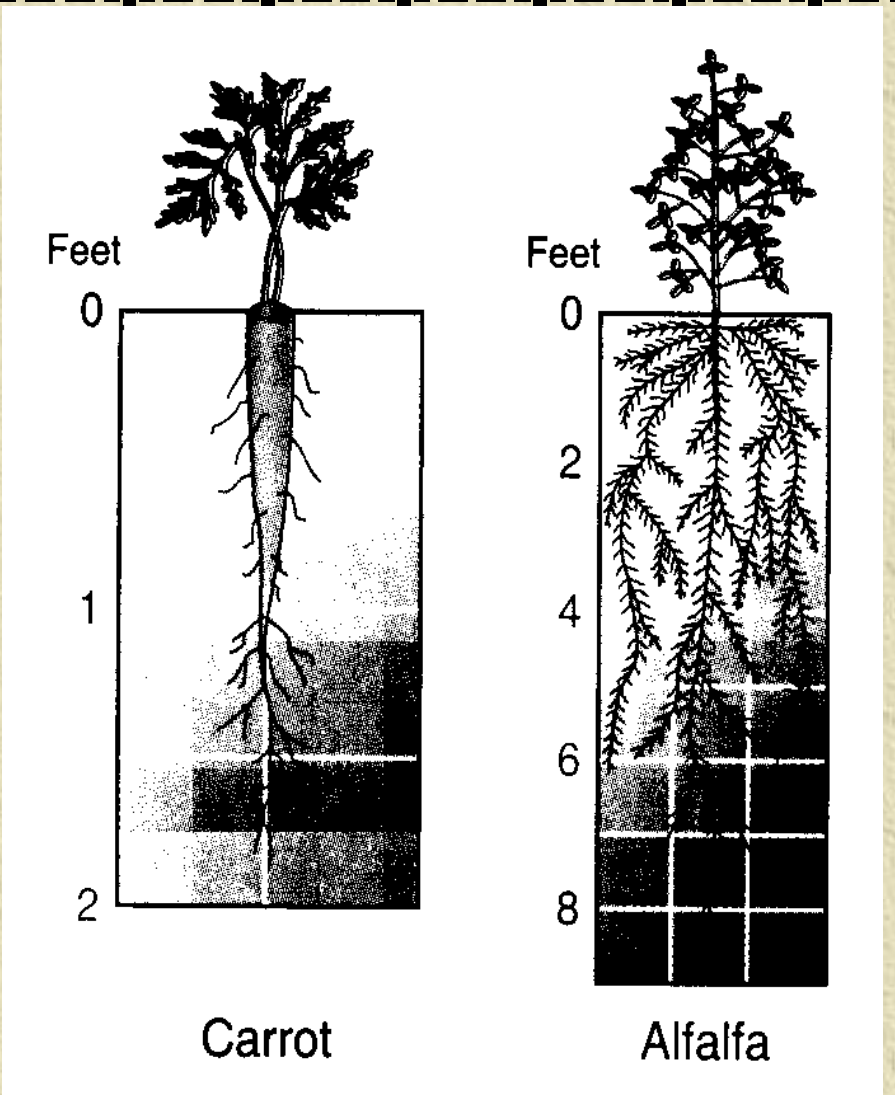
Sugars go down



3. Identify the two major types of root systems

- A root system which is composed of one main primary root and many secondary roots branching off of the primary root is called a ***taproot system***.

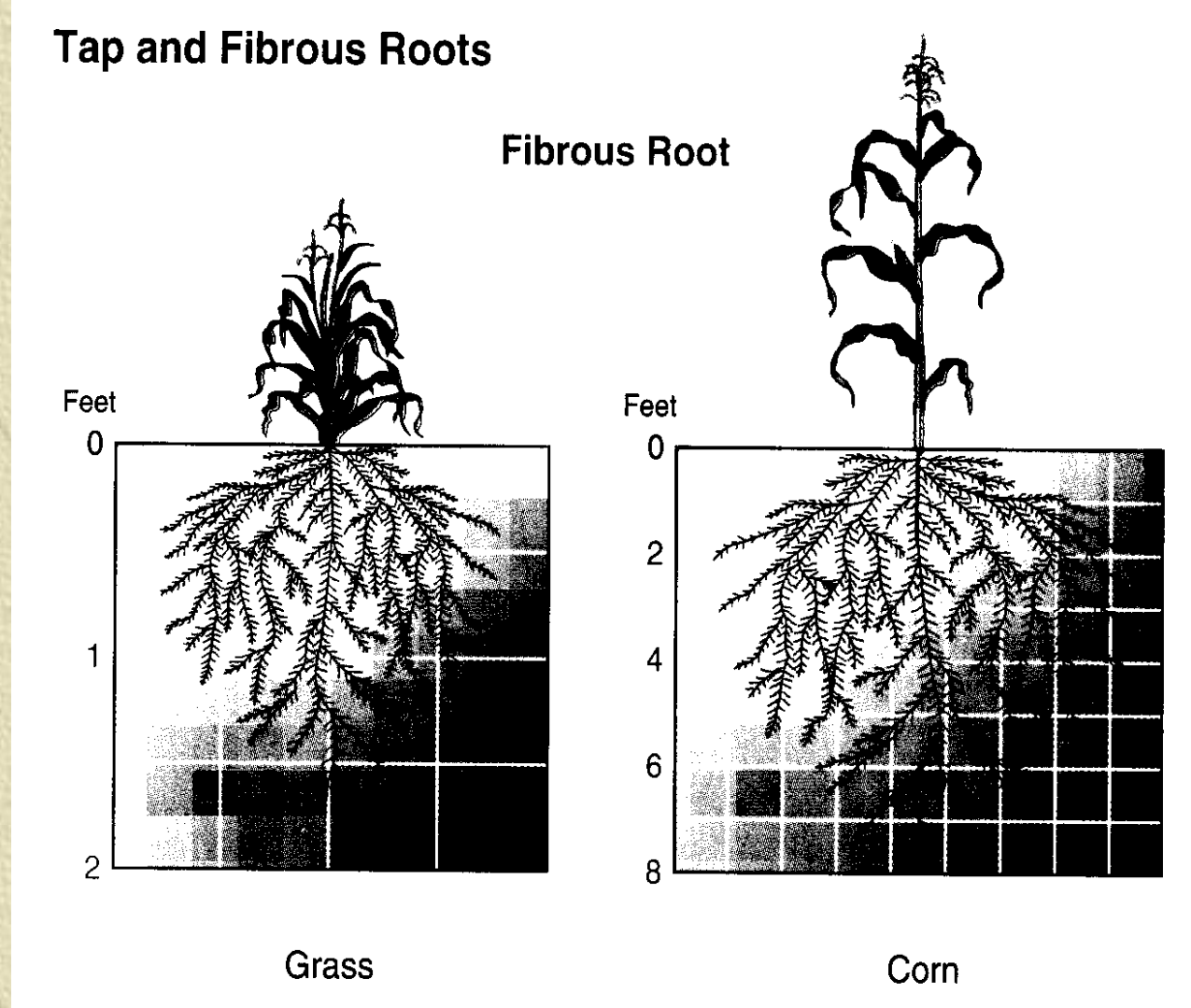
Types of Roots -- Tap



3. Identify the two major types of root systems

- A system which has no dominant primary root but is made of many primary and secondary roots of similar size is called a ***fibrous root system***.

Types of Roots -- Fibrous



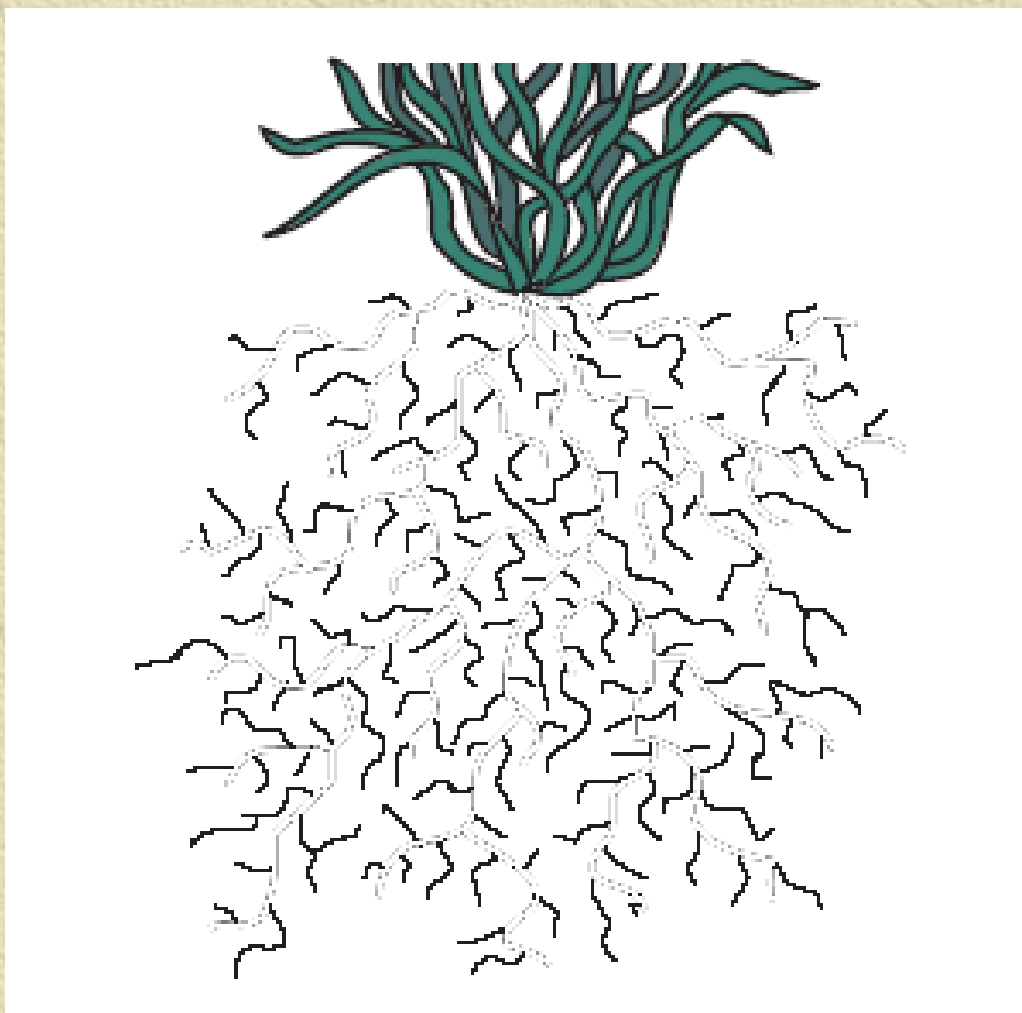
4. Recognize a healthy root system

- A healthy root system is white or nearly white in color and smells fresh.
- If roots are black, brown, or dark orange and smell rotten or sour, the root system is having some problems.

4. Recognize a healthy root system

- Watering a plant properly is one of the most important ways to keep the root system healthy.
- Proper watering for most plants involves growing the plants in pots with proper drainage holes in the bottom of the pot.
- The pot is soaked with water until it is dripping out of the drainage holes.
- This encourages roots to grow through the entire pot. The plant's soil is usually allowed to dry slightly before watering again. If plants have adequate drainage, over-watering of plants is not a matter of *how much* water, but of *how often* watering occurs.

Taproot or Fibrous root



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