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Minnesota Nursery and Landscape Association (MNL) Foundation

BOTANY, PLANT PHYSIOLOGY AND PLANT GROWTH

LESSON 5 - PLANT PARTS AND FUNCTIONS

PART 3 - ROOTS



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Plant Parts and Functions

Part Three: Roots

Segment One – Functions of Roots

Segment Two – Types of Roots

Segment Three – Parts of Roots

Segment Four – Roots as Food Crops

Segment Five – The Root Zone

Segment One

Functions of Roots

Functions of Roots

- To absorb nutrients and water
- To anchor the plant in the soil
- To serve as food storage organs

Segment Two

Types of Roots



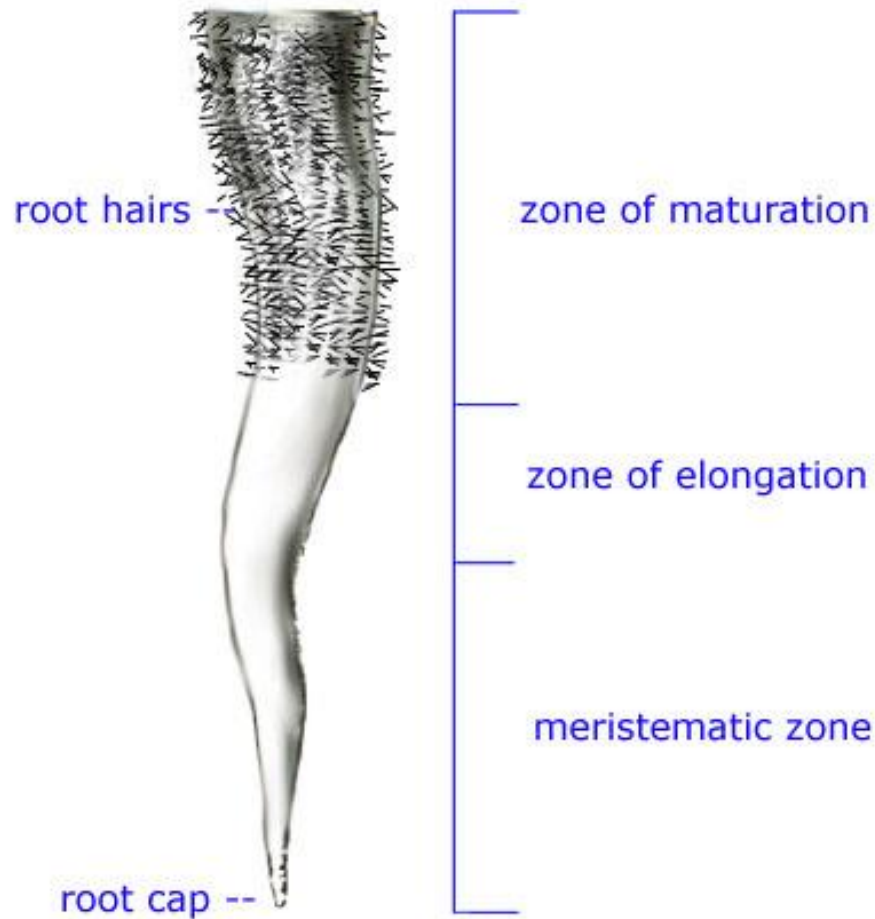
taproot



fibrous root

Segment Three

Parts of a Root



Segment Three

Parts of a Root

Root Cap – functions to protect the delicate meristematic zone and the growing root tip; the root cap also lubricates the root tip to help foster root expansion through the soil.

Meristematic Zone – the location of the apical meristem, a region where cells are actively dividing to enable growth of the root through the soil.

Segment Three

Parts of a Root

Zone of Elongation – the region just behind the meristematic zone where the new cells expand to their mature size.

Zone of Maturation – the zone where cells differentiate to serve their ultimate functions in the developing root.

Segment Three

Parts of a Root

Root Hair Zone – the region of the root near the growing root tips where root hairs develop as the cells mature; root hairs are extensions of the epidermal cells that increase the surface area of the root dramatically and increase the ability to take up water and nutrients; the majority of water and nutrient uptake occurs in the root hair zone.

Segment Three

Parts of a Root

Crosssectional diagrams of monocot and dicot roots

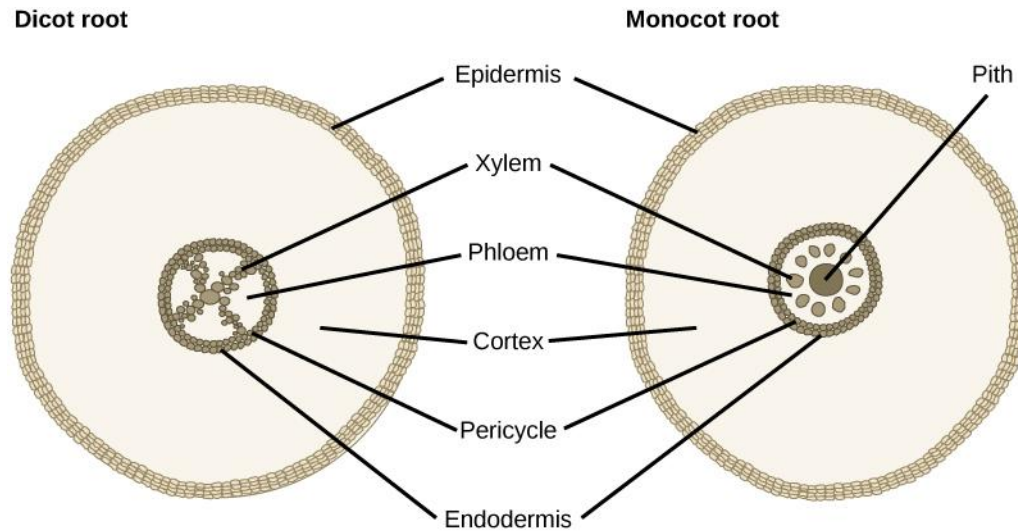


Diagram produced by Robert Bear, David Rintoul, Root and Leaf Structure. OpenStax CNX. Mar 25, 2014

Segment Four

The Root Zone

A plant's root system is not a mirror image of the crown

Tree and shrub roots extend well beyond the drip line (the edge of the canopy).

While some roots are found deeper in the soil, most roots occur in top 12" of soil.

Segment Five

Roots as Food Crops

Sweet Potato

Carrot

Parsnip

Salsify

Radish

Sugar Beet



Review

Plant Parts and Functions – Part Three

Segment One – Functions of Roots

Segment Two – Types of Roots

Segment Three – Parts of a Root

Segment Four – The Root Zone

Segment Five – Roots as Food Crops

Review – Functions of Roots

- To absorb nutrients and water
- To anchor the plant in the soil
- To serve as food storage organs



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