BOTANY, PLANT PHYSIOLOGY AND PLANT GROWTH
LESSON 5 - PLANT PARTS AND FUNCTIONS

PART 3 - ROOTS
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

- 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

- root cap
- root hairs
- zone of maturation
- zone of elongation
- meristematic zone
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

Crossectional diagrams of monocot and dicot roots

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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