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Radishes  
North American radishes (*Raphanus sativus*) are of the family Brassicaceae, better known as the mustards. The accumulated storage in their taproots form pronounced fleshy "bulbs". As biennials, humans harvest radishes at the end of the first season after the greatest amount of nutrients have been translocated to the roots, which swell as parenchyma tissue in the xylem proliferates. Radishes possess red color were mutations that were was developed in the eighteenth century as a result of human selection, and have been perpetuated since then. They are approximately 95% water, and have eighteen diploid chromosomes. Because of the large portion of their roots that is constituted of nutrients and water extracted from the soil, the radish is an ideal plant to utilize in this experiment.Roots  
A tap root, which is a large central root utilized primarily for storage, is characteristic of dicotyledons, of which radishes are an example. It stores within its proportionately vast number of leucoplasts the starches that are transported to the sink by phloem vessels from photosynthetic sources. A large amount of the nutrients absorbed by the roots are the result of the tangled system of cilia-like root hairs.  
  
  
  
Life Cycle  
The diagram below illustrates the biennial life cycle of the radish.Nutrient Absorption and Transport  
Roots occasionally absorb materials by means of diffusion, but more often with active transport. The methods utilized to spread nutrients throughout the plants' anatomy differ (due to plant physiology) between monocotyledons and dicotyledons. Because the radish is a dicotyledon, the nutrients progress through the epidermis cells into the cortex, which constitutes a generous portion of the root cell. They then diffuse and are actively transported to the center of the root where the vascular bundles are located. The endodermis, a layer of cells surrounding the vascular bundles, permits only certain nutrients to pass into the vascular tissue to be dispersed throughout the plant's system. The Casparian strip, a waxy band, encircles the endodermis and is semi-permeable, allowing the desired minerals to progress through. Another ring of cells, the pericycle (responsible for lateral root growth) is located within the endodermis around the vascular tissue. Once the minerals reach the xylem tissue, they are transported up the stem and to where they are essential.Soils  
The soil type, or profile, of a region is the result of years upon years of parent rock weathering and breakdown under the actions of rain, frost, wind, and chemical forces. Within the topsoil, fine particles of rock and decayed/decaying material, the roots absorb the nutrients needed by the plant to survive. The concentrations absorbed is dependent upon the needs of the plant and the availability of nutrients in the soil. Older soil tend to contain more humus than newer ones, which affects the welfare of the plant. Also, the water content and porosity of the soil influence the plant, and temperature may affect the autotrophs by altering metabolic rates and stimulating the increased chances of contracting soil-borne diseases.Soils Used  
The commercial soils ,and their respective known ingredients (as stated by the manufacturer), that were selected for the experiment were:  
**Scott's (pH: 7)** - phosphate, spagnum peat moss, perlite  
**Bandini (pH: 6)** - sphagnum peat moss, selective ground for bark, no sewage or manure  
**Uni-Grow (pH: 7)** - forest products, peat moss, vermiculite, sand  
Soil Components  
**Phosphate**: encourages plant growth  
**Spagnum peat moss**: improves water drainage and soil aeration  
**Perlite**: improves water drainage and soil aeration  
**Ground bark**: enhances soil porosity  
**Forest products**: plays role of artificial humus  
**Sand**: imroves water drainage, decreases field capacity of soil  
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