PLANTS

Plant Mineral Requirements

Nitrates are needed to make amino acid which make proteins. A nitrate shortage leads to stunted growth.

Magnesium is needed for chlorophyll production. A shortage leads to yellow leaves. Same with Potassium

Phosphate and Potassium - help photosynthesis

(Lack of - purple baby leaves)

Photosynthesis (energy required).

Photosynthesis is the process that produces 'food' (glucose) in plants. Photosynthesis takes place in the leaves of all green plants.

$$\text{Carbon dioxide} + \text{Water} \xrightarrow[\text{Chlorophyll}]{\text{SUNLIGHT}} \text{Glucose} + \text{Oxygen}$$

$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

Needed for PHOTOSYNTHESIS

1) Light, usually from the sun, is absorbed by the chlorophyll.
2) Chlorophyll - absorbs the energy of sunlight and uses it to combine CO_2 and water to produce glucose.
3) Carbon dioxide - from the air
4) Water - from the soil.

Glucose is used as ready energy during respiration. Glucose is soluble and it is used as energy to make new cells (cellulose), cell walls, proteins and more chlorophyll. When not needed glucose is stored as ~~starch~~ insoluble starch which is stored in the stem, leaves or roots and seeds.

LIMITING FACTORS

Temperature - as the temperature increases, so does the rate of photosynthesis. Temperature is the limiting factor. As the temperature approaches 45°C the rate of Photosynthesis drops to 0. The enzymes controlling PS have been denatured.

CO_2 Concentration As the rate of CO_2 concentration increases so does the rate of PS. After a certain point an increase in CO_2 has no further effect. CO_2 is no longer the limiting factor, temperature or light is.

Light Intensity