

Factors Affecting Salt Absorption — Absorption of mineral salt is affected by the number of internal and external factors,

Internal factors is Growth and Aging - In Growth, active cell division, elongation and developmental processes promote absorption of salt.

With the ageing of plant parts such as roots, the absorbing capacity decreases, External factors are temperature, pH, Light, Oxygen, Interaction of ions etc.

By temperature - the absorption of salt increases with increased temperature, but in very high temperature the salt absorption is inhibited due to denaturation of enzymes.

By pH, the decreased in the pH of soil solution activate the absorption of anions where as increased pH favours absorption of cations.

The light indirectly affects the transpiration & photosynthesis showing its influence in salt absorption.

oxygen influences active salt absorption. In absence of oxygen active salt absorption is inhibited.

Interaction of ions affect absorption because the absorption of one ion is influenced by the presence of other ions in the medium.

Translocation of mineral -

Translocation of mineral salts takes place both by xylem & phloem. The upward movement occurs through xylem while bidirectional movement (upward and downward from mature leaves) occurs through phloem and laterally from xylem to phloem also. The transport of ~~xylem~~ minerals in xylem occurs along with the transpiration stream. Analysis of xylem sap shows the presence of large amount of dissolved salts. This upward transport of salts continues even when the phloem tissue

were removed. Some minerals are transferred radially from xylem to the phloem mainly through parenchymatous. They are also transported to other tissues where they accumulate in the living cells.

Translocation: mainly occurs from leaves just before the abscission. The movement of ions in the phloem occurs both upward and downward in the younger leaves and to apical regions of stem and root.

Mechanism of Translocation - It is generally believed that absorbed ions diffuse freely into the root across the epidermis, cortex, and finally reach up to the endodermis. Further movement is related by the Casparian strip present in the endodermis. The movement of ions from endodermis to non-living xylem elements is an active process. It requires the metabolic energy comes from respiration. The concentration of xylem sap remains usually greater than those of surrounding cells. The ions move from endodermis to xylem against concentration gradient and therefore requires extra energy.

Once the mineral enters in to xylem element, they are translocated upward along the translocation stream. These are transferred radially into phloem (through the cambial cells). Some of the minerals are still transported through phloem along with organic solutes. Some minerals are accumulated in living tissue of parenchyma.

Considerable amount of certain more mobile ions from the older leaves to younger leaves. The movement occurs through the phloem as it is prevented killing of the phloem. While upward translocation occurs mostly in the xylem but downward movement can occur in phloem element.

Cytochromes → Iron porphyrins combined with protein (haem protein) which in oxidised form contain Ferric (Fe^{+++}) and in reduced form ferrous (Fe^{++}) iron.

- Cytochromes are active in terminal oxidation or electron transport system in respiration.