

Water-soluble elements

The water-soluble elements of a soil determine the concentration of substances in the soil solution. Dissolved substances always occur as charged particles (ions). These can transmit electrical current. Therefore, to determine the salt content (= sum of the dissolved particles), the electrical conductivity in the soil-water extract is measured. Abbreviation: EC, unit: mS/cm.

Ecological importance:

The **soil solution** is the most important medium for plant nutrition. Plant roots can absorb only dissolved substances. Therefore, the soil solution should have an “ideal composition” of individual nutrients, as plants can only selectively take up nutrients to a certain extent. This means that the absorption of certain nutrients is only working optimally from an “ideal solution”.

The dissolved substances are also available to **microorganisms** as a **mineral source** and contribute to aggregate stability. However, they can also be washed out with the leachate and affect adjacent ecosystems (e.g. groundwater bodies).

The concentration of the soil solution is affected by:

Input of organic and mineral fertilizers, tillage, substances on the sorption complex, soil acidity, rising groundwater, climatic conditions.

Certain substances are **very soluble in water** (=immediately plant-available / prone to leaching), e.g. compounds of nitrate, sulphate, chloride. Others are **poorly water-soluble**, e.g. compounds of carbonate, phosphate and silicate.

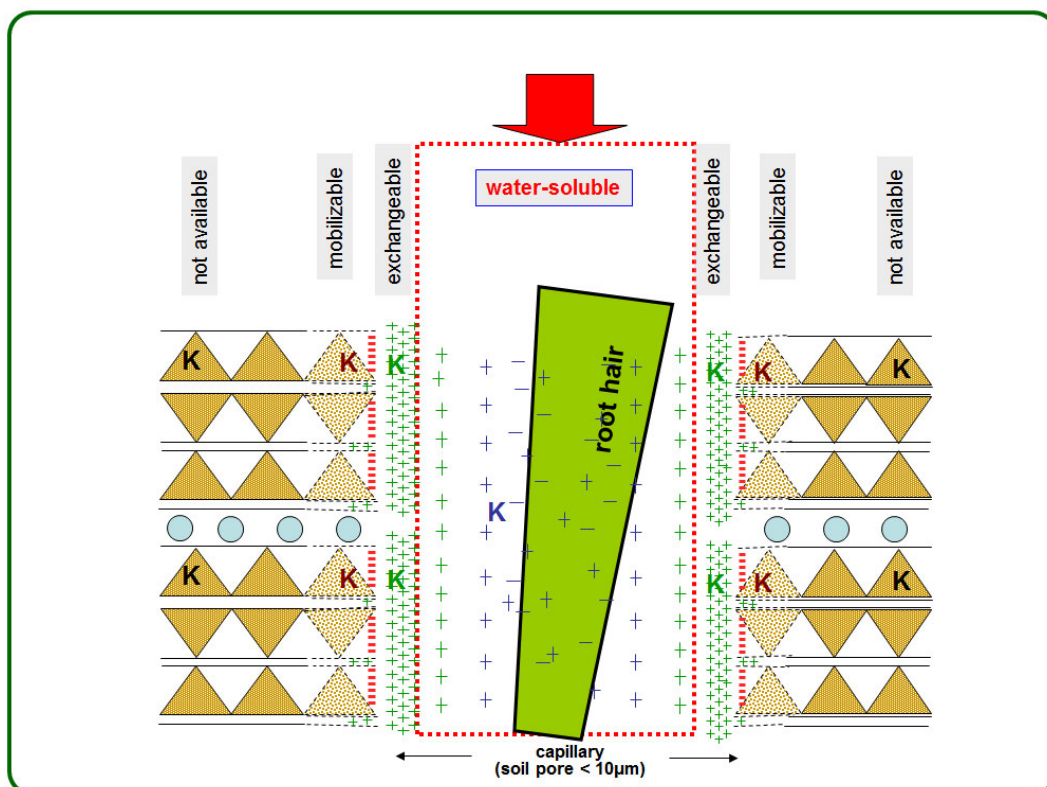


Figure: Soil pore, elements (e.g. K) in different solubilities, highlighted: water-soluble elements.