Abstract

Plants receive K^+ mainly from the soil through the root system. In soil, K^+ occurs primarily in minerals such as mica and potassium feldspar. The availability of K^+ for plant uptake depends on the form in which K^+ occurs in soil. There are forms directly available, slowly available, and unavailable for plant and the transition of K^+ between these pools may occur.

In plant, K^+ is very mobile and it occurs in high amount in cells. It is the most prominent cytoplasmic cation. It affects high number of metabolic processes, including photosynthesis, osmoregulation, and activation of enzymes.

K^+ shortage can cause changes in plant morphology, anatomy and metabolism. K^+ deficiency can be manifested by leaf deformation, decreased leaf area, necrosis, short internodes, reduced rate of photosynthesis, etc. K^+ deficient plant is also more vulnerable to pathogens and its resistance to abiotic stress factors such as drought, low temperatures, or salinity is decreased. Deficiency of K^+ reduces the biomass and overall yield in agricultural crops, so K^+ fertilizers, both soil and foliar, are needed.

The thesis focuses on the manifestations of K^+ deficiency in plants and summarizes the recent findings on mechanisms of K^+ deficiency perception and signal pathways leading to the response to this deficiency.

Key words: potassium, deficiency, stress, signaling