



Frontiers of Potassium

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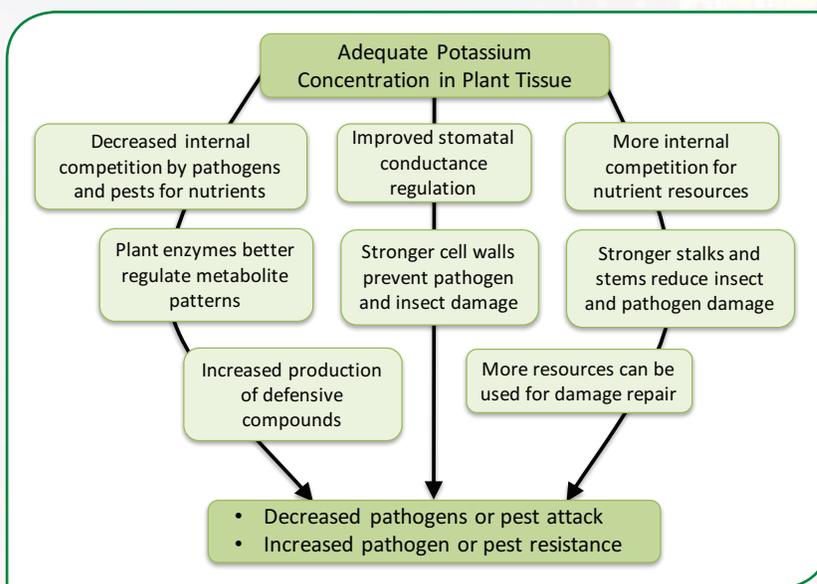
POTASSIUM HELPS PROTECT PLANTS FROM STRESS, DISEASE, AND INSECT DAMAGE

During the upcoming Frontiers of Potassium Science conference, the link between potassium and plant health will be explored in depth. (kfrontiers.org).

Potassium plays an essential role in many well-recognized metabolic processes for plants. Potassium's contribution to sustaining high yielding crops with top quality is well understood. However, the role of potassium in plant stress resistance is less known and appreciated. Potassium is unique among the essential mineral nutrients in its role for plant survival against environmental stress, pests, and diseases.

Supplying an adequate potassium supply to crops through proper fertilization is a simple way to lower the requirement for pest-control treatments that may be costly, time-consuming, and troublesome. The frequently observed benefits of potassium on plant health were reviewed by Wang et al. (2013) which summarizes many recent scientific studies.

When there is a lack of sufficient potassium in plants, low molecular weight compounds begin to accumulate. This accumulation of soluble nitrogen-containing compounds (such as amino acids and asparagine) and sugars (such as sucrose) make a particularly favorable environment for numerous pathogens and insects. For example, aphids are severely nitrogen limited, making potassium-stressed plants an attractive host as an abundant nitrogen source. The presence of sufficient potassium also promotes the production of defensive compounds (such as phenols) which are an important component in plant pest resistance.



Proper potassium nutrition improves plant resistance to pathogens and insects through many mechanisms (Figure adapted from Wang et al., 2013).

An adequate potassium concentration within the plant decreases the internal competition with various pests and pathogens for resources. This results in more resources available for hardening cell walls and tissues to better resist penetration of pathogens and insect pests, and to repair any damaged tissue. Air-borne pathogens are more rapidly shut out from stomatal invasion when adequate K is present.

Wang, M. et al. 2013. Internat. J. Molec. Sci. 14:7370-7390. Available: <http://www.mdpi.com/1422-0067/14/4/7370>



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