Lithovit®

Effects of the eco-friendly, highly effective foliar fertilizer

Based on calcareous minerals, Lithovit® contains a large quantity of carbonates in form of calcium and magnesium carbonate. Other components naturally contained are silicon dioxide (SiO_2) and micronutrients like iron, copper, manganese and zinc.

During the production process the minerals are ground in a particle collision mill, resulting in particle sizes of a few micrometer (< 25 µm for the largest particles but around 6 to 9 µm for the major part).

Lithovit® is sprayed as a suspension on the plants, usually at a concentration of 0.3 to 0.5 %. The fertilizer can enter the leaves partly directly via the stomata due to the very low particle size. The remaining part of the fertilizer precipitates on the leaves as a thin mineral layer. The figure shows a scheme of the leaf tissue structure. Stomata control the gas exchange of the plant. Water vapor and oxygen diffuse from the leaf to the ambient air while CO_2 enters the leaf through the stomata and moves to the location of photosynthesis.

The diffusion rate and herewith the concentration of the gases inside the leaf depend on the gradient of concentration of the gases between the ambient air and the plant tissue. The carbonates of the Lithovit® which enter the leaf directly through the stomata get converted into CO_2, water, calcium- and magnesium-ions and increase the concentration of CO_2 in the leaf, **resulting in a higher photosynthesis rate and an improved water use efficiency of the plant.**

In a second process (which lasts much longer) the carbonate precipitation on the leaf is transformed into CO_2. This chemical reaction is called calcium hydrogen carbonate equilibrium reaction. It also increases the CO_2 concentration in the ambient air. Accordingly, more CO_2 diffuses into the leaf and the photosynthesis rate and the plants water use efficiency raise.

As an effect of these processes the foliar fertilization with Lithovit® lead to an **improved plant growth** and development under environmental stresses. Positive effects have been observed especially under water stress conditions. But also under non-stress conditions **higher chlorophyll content at fertilized plants have been observed, indicating a healthier plant.**

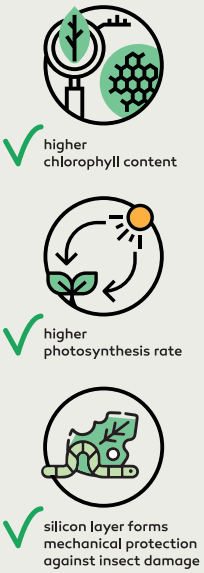
Next do the carbonates Lithovit® contains a considerable amount of silicon dioxide (SiO_2). Recent researches show the importance of an adequate supply with silicon for plants.

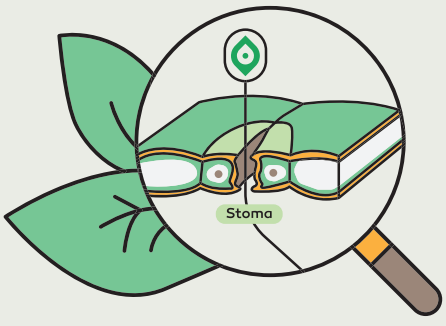
Next to positive structural effects many metabolic processes are fostered when sufficient silicon is supplied to the plants. **This results a better resilience to diseases or insect pest.**

These effects are well documented by scientific publications. Mechanisms of action are the formation of a silicon layer in the cuticle of the leaf, which provides mechanical protection against insect damage or the intrusion of pathogens such as fungal spores and the direct influence on plant metabolism (enzyme activities, activation of biological defence).

In addition, the Lithovit® Special product family with its combinations of calcareous minerals with especially selected macro- and micronutrients offers crop-specific foliar fertilizers.

Recent examples are Lithovit® Cocoa for the cocoa production in West Africa or Asia or Lithovit® Rice for the rice production in Asia and Africa.





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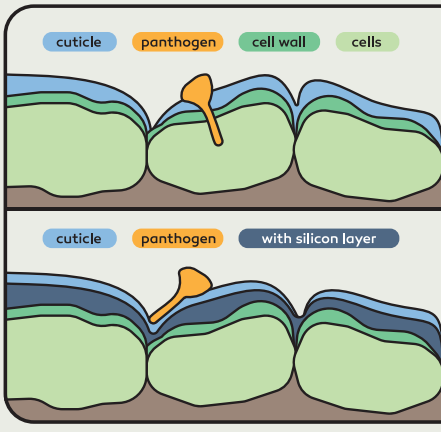

Comparison of a plant cell wall with and without an embedded silicon layer using the example of a rice leaf.
Quelle: Wang et al., 2017, Role of Silicon on Plant-Pathogen Interactions.

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