Korn-KALI®

THE ALL-ROUNDER

✓ for organic farming



K+S

KALISOIL

Korn-KALI®

Our all-rounder is perfect for your various applications

MINERAL FERTILIZER
K_2O (MgO, SO_3) 38 (6+12)

38 % K_2O water-soluble potassium oxide (= 31.5 % K)
6 % MgO water-soluble magnesium oxide (= 3.6 % Mg)
12 % SO_3 water-soluble sulfur trioxide (= 4.8 % S)



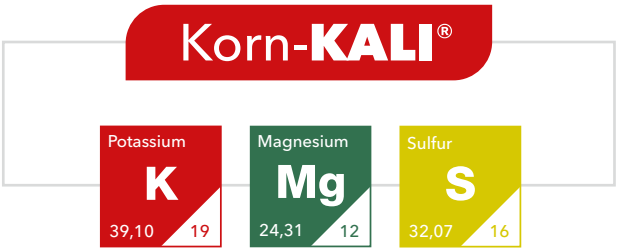
Made in Germany

Korn-KALI contains magnesium sulfate derived from the natural mineral kieserite, which K+S exclusively mines in Germany. This unique chloride-based potassium fertilizer contains magnesium and sulfur.

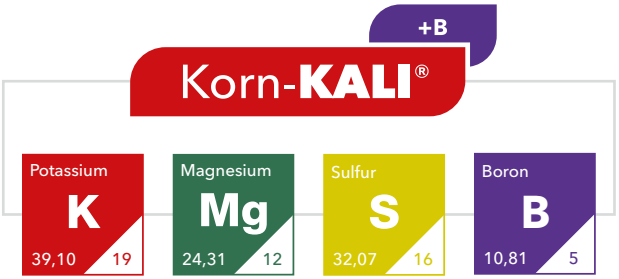
Korn-KALI® the all-rounder:

- High nutrient availability and a wide range of applications
- Ideal for providing basic potassium and magnesium to sulfur-requiring crops
- Maximum nutrient concentration for advantages in logistics, storage, and application
- Quickly water-soluble and immediately available to plants
- Suitable for many chloride-tolerant crops
- Works independently of the soil's pH value – no increase or decrease due to Korn-KALI
- Ideal for maintaining magnesium levels in the soil
- Precise application due to narrow granule size range
- Ideal potassium fertilizer for stubble and fall fertilization
- For single application or for further processing in bulk blends
- approved for use in organic farming in accordance with Regulations (EU) 2018/848 and (EU) 2021/1165

Our Korn-KALI® multi-nutrient fertilizer with K, Mg, and S has been proven and reliable for decades.



Also available with 0.25 % water-soluble boron as



Potassium, magnesium, and sulfur – nutrients with important functions

Potassium, magnesium, and sulfur influence anatomical, physiological, and biochemical reactions in plants.

1 Potassium deficiency affects leaf anatomy, which impacts CO_2 diffusion.

2 A deficiency of potassium and magnesium leads to structural changes in chloroplasts, which disrupt photosynthesis. Sulfur is a component of chloroplast proteins.

3 Magnesium is the central atom of chlorophyll and is essential for its biosynthesis.

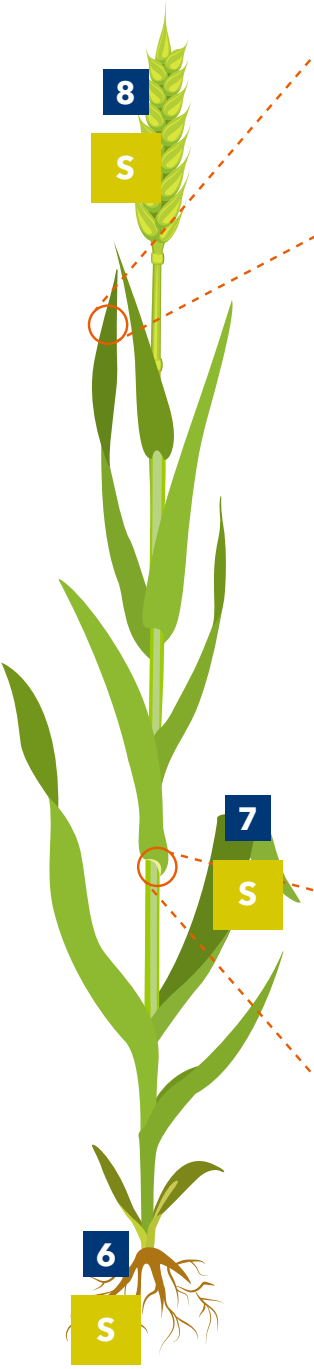
4 Potassium and magnesium are involved in the fixation and transportation of CO_2; Rubisco is an important enzyme in photosynthesis. Without these nutrients, photosynthesis is impaired.

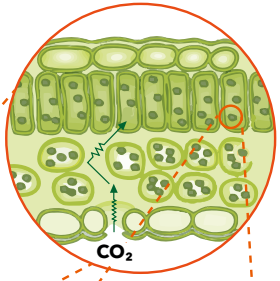
5 Potassium and magnesium are necessary for transporting assimilates, such as sugars and starches.

6 Sulfur improves nitrogen uptake.

7 Sulfur reduces nitrate content through complete N conversion and activates important enzymes in energy and fatty acid metabolism.

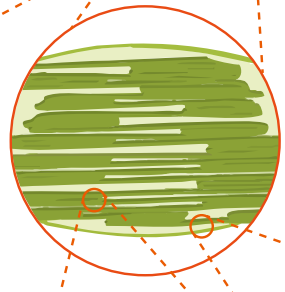
8 Sulfur is a component of vitamin B1, which is found in grains and legumes (e.g., soybeans).





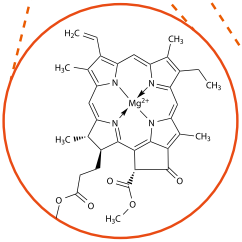
1 Leaf anatomy

K



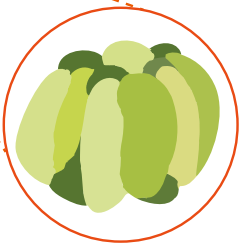
2 Chloroplast structure

K Mg S



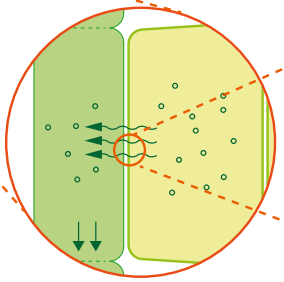
3 Chlorophyll

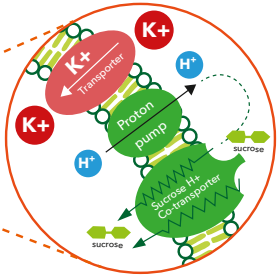
Mg



4 Rubisco activity

K Mg





5 Assimilate transportation

K Mg

Modified according to Tränkner et al. Physiol. Plant (2018)

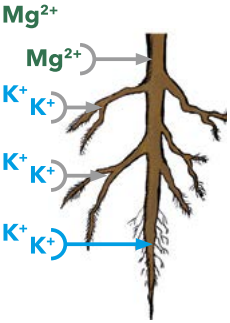
Potassium and magnesium support plants during dry periods, promoting good yields even in reduced water conditions

- Potassium regulates the stomata on the underside of leaves. Optimal transpiration ensures the plant uses available water efficiently for biomass production.
- Potassium and magnesium are important for photosynthesis and promote the transportation of assimilates from the leaves to the roots and yield-forming organs. Therefore, both nutrients ensure good root growth and successful yield formation.
- A strong root system allows plants to absorb water from deeper soil layers.
- Magnesium strengthens plants against heat and high radiation.
- Potassium increases the soil's water storage capacity, so less water seeps away unused, making it available to plants for growth and yield formation.

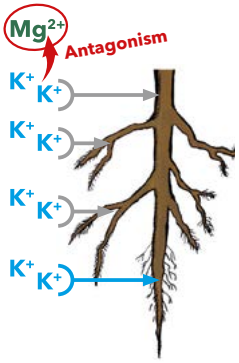
Sulfur provides an additional efficiency boost.

- It is an essential component in the formation of sulfur-containing amino acids and proteins, influencing overall protein synthesis.
- It is a component of the metabolic product glutathione.
    - Glutathione is an antioxidant that neutralizes oxygen radicals during drought stress, preventing leaf damage.
    - Sulfur is important for producing other plant-specific defense substances (e.g., phytoalexins), which support plant health and pathogen defense.
- An adequate supply of sulfur enables plants to maintain optimal physiological processes, even under drought stress, and avoid or minimize yield losses.
- Don't forget! Sulfur is important for forming sulfur-containing secondary plant substances, such as leek and mustard oils, which influence the taste and smell of cultivated plants.

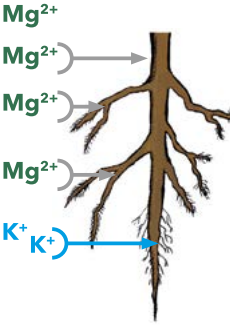
Why does potassium inhibit the uptake of magnesium, but not the other way around?
Both potassium and magnesium are absorbed by plants via transporters in the membranes of root cells. Depending on the nutrient conditions, competition primarily arises for the "non-specific" transporters. Despite its availability, magnesium often loses out and is not absorbed!



Balanced K/Mg ratio
Potassium is absorbed via specific and non-specific transporters; magnesium is absorbed exclusively via non-specific transporters. Both nutrients are absorbed by plant roots as needed.



High K availability, low Mg availability
An excess of potassium blocks non-specific transporters. Due to this antagonistic relationship, **insufficient magnesium is absorbed.** Therefore, the magnesium requirement must be ensured through fertilization.



High Mg availability, low K availability
Although magnesium blocks non-specific transporters, potassium can still be absorbed via specific transporters, ensuring the plant's supply.

Non-specific cation transporters for the uptake of, for example, K^+ or Mg^{2+}

Specific K^+ transporters (they only take up K^+ ions)



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