



Fertilizers
Europe

A photograph of a person's hands holding a wooden crate filled with fresh vegetables, including carrots and radishes. The scene is set in a field at sunset, with a warm, golden light. The person is wearing a blue and white plaid shirt and a green apron. The background shows a field of green plants.

Calcium and Magnesium in food production

Vital elements of plant health

Did you know ?

Calcium **Ca**

Magnesium **Mg**

Calcium builds strong cell walls. **Ca**

Calcium improves disease resistance. **Ca**

Mg Magnesium deficit can cause stunted growth.

Mg Magnesium is vital for plant **respiration**.

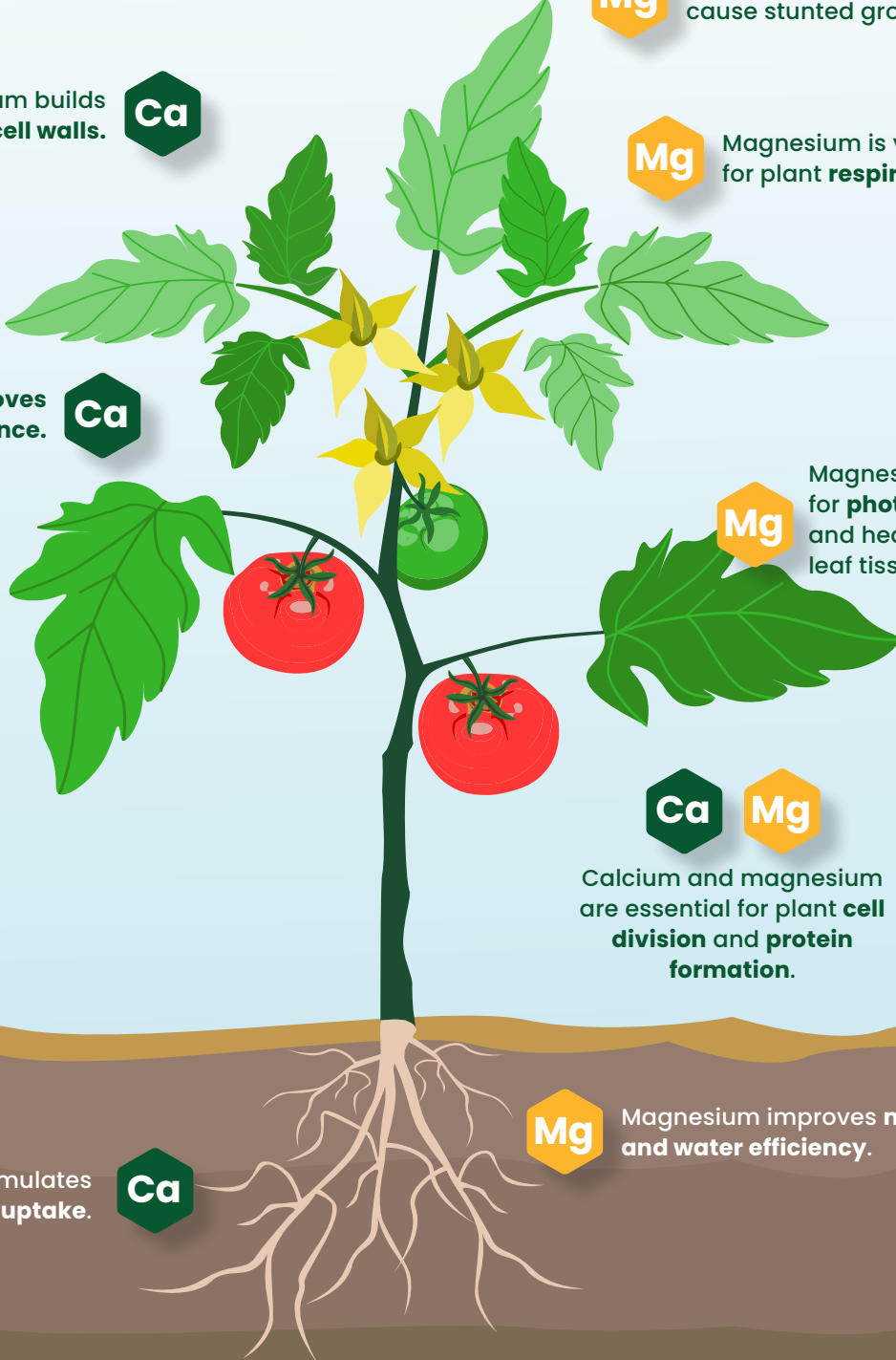
Mg Magnesium is key for **photosynthesis** and healthy green leaf tissue.

Ca **Mg**

Calcium and magnesium are essential for plant **cell division** and **protein formation**.

Calcium stimulates nutrient uptake. **Ca**

Mg Magnesium improves nutrient and water efficiency.



Calcium and Magnesium sources available to farmers

Farmers cannot profitably grow food without calcium and magnesium.

Calcium and magnesium are secondary nutrients for plants. Although these nutrients can't be found as free elements in nature, they are some of the most abundant elements in the Earth's crust. However, not all calcium and magnesium are directly available to plants, the minerals need to also be in a specific form. By applying calcium or magnesium through mineral fertilizers, a steady supply of plant available calcium and magnesium can be ensured.

Calcium can be found in relatively insoluble inefficient sources such as in lime and gypsum, in slow-release forms such as in polyhalite, or in more readily available forms such as calcium nitrate and calcium chloride. Application of calcium through mineral fertilizers ensures that the right quantity of calcium is available to crops.

Plant available magnesium is found on the surface of clay and organic material. If there is a deficiency in the soil, magnesium can be added through the application of dolomitic limestone, which should be incorporated prior to planting. Alternatively, fertilizers containing potassium sulphate and magnesium sulphate can be used. Mineral fertilizer for the application of magnesium is especially useful when no alteration to soil pH is required.

Mineral fertilizers containing calcium and magnesium have several advantages:

- Contain predictable amounts of Ca and Mg
- Provide nutrients in plant available forms
- Suited for application with precision farming technologies
- Ensure healthy and productive growth while minimizing nutrient loss through targeted application
- Foliar application is possible when climatic conditions are not ideal or when root function is limited

“Plants deficient in calcium have been shown to be more susceptible to pathogens¹...”



“Edible agricultural products are the main source of Mg nutrition for humans and animals².”

¹ Thor K (2019) Calcium-Nutrient and Messenger. Front. Plant Sci. 10:440.

² Wang Z, et al. (2020) Magnesium Fertilization Improves Crop Yield in Most Production Systems: A Meta-Analysis. Front. Plant Sci. 10:1727.



Balancing crop nutrition for healthy crops and fertile soils

A good crop feeding strategy can be achieved with a balanced supply of the main nutrients. Balanced nutrition is essential to help crops reaching high yields and quality, achieving a crop's maximum potential.

Balanced plant nutrition is a vital element of sustainable crop and soil management.

Deficiency in calcium and magnesium are more common in acidic and sandy soils; however, soil and plant testing are always good practice to assess soil availability and crop uptake. Calcium and magnesium amend and improve soil structure by bridging its ions. It is also essential for soil microorganisms, enabling better crop residue decomposition, nutrient release, soil aggregation and water holding capacity.

Magnesium relies on a window of soil pH for ideal plant uptake. Soil pH lower than 5.8 may influence uptake with excess hydrogen and aluminium interfering with magnesium in the soil, whereas soil pH values greater than 7.4 may cause excess calcium to interfere with magnesium uptake. If magnesium deficiency is present, the lowered photosynthesis potential of the plant may stunt growth and the plant may present brittle, cupped, and/or discoloured leaves.

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