

Magnesium

Secondary Macronutrient Profile



Magnesium (Mg) is essential to plant life, because it fuels vital functions like photosynthesis. It is the central atom in the chlorophyll molecule, which is key to the crop's ability to absorb light. It is no surprise then that magnesium deficiency can stunt plant growth and cause overall poor development.

Magnesium's Function in Supporting Plant Growth

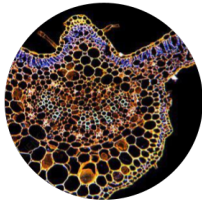
Magnesium is the central molecule in energy capture and is involved in the activation of many enzymes. Mg^{2+} and its role in carbohydrate production in leaves are essential to biomass accumulation and fruit development. Mg is also crucial to many core functions, including:



Energy Transfer



Carbohydrate Metabolism



Carbohydrate Translocation



Photosynthesis



Protein Synthesis

Mg impacts nearly all aspects of plant growth, including the translocation of carbohydrates, a vital energy source, and building material for the plant structure. To ensure healthy crop development, growers must make certain that Mg is available in sufficient quantities.

Factors That Impact Magnesium Availability

Magnesium is taken up by plant roots as Mg^{2+} from the soil solution mainly by diffusion. Magnesium exists in soils as primarily exchangeable and solution Mg. The availability of Mg to plants is dependent upon:

- Solution Mg
- Exchangeable Mg
- Other exchangeable ions
- Soil pH
- Texture
- Type of clay

Coarse texture soils with high levels of exchangeable Al, Ca, K or H have a greater potential for Mg deficiency. Magnesium can become unavailable in acidic soils with 2:1 clays. Deficiencies are common during fruit ripening and in the early spring when soils are cold and wet.

Impact of Magnesium Deficiency on Crop Yield

If Mg is limiting, it can impact crop yield and quality. Deficient plants that receive Mg fertilization are likely to respond with greater crop production. In a [2020 study](#), researchers found an average yield increase of 8.5% across Mg fertilized crops. The impact of magnesium on crop yields is even more important considering that latent and acute Mg deficiencies are common in crop production.

Common Signs of Magnesium Deficiency

Magnesium is phloem mobile in the plant. As a result, it is readily translocated from older to younger plant tissues, causing deficiency symptoms to appear on the older leaves first. The classic leaf symptom for deficiencies is a “Christmas tree” pattern, with yellow interveinal chlorosis more prominent at the leaf tips and margins, dark green veins, and darkest coloring at the petiole end (See Figure). As the symptoms advance, the entire leaf will yellow, and necrosis on the tip and margin will develop.



Tomato



Citrus



Grape

The only way to confirm a Mg deficiency is with a tissue test. Other factors could be causing these symptoms.

Correcting Magnesium Deficiency in Your Crops

The first step in correcting a Mg deficiency is taking a soil sample. It is a good idea to take a soil sample at the same time the tissue sample is taken. It is possible that an amendment application will be required, and Mg can be applied to the soil at that time. Mg applications can be dangerous when applied to crops grown in serpentine soils high in magnesium. Understanding the soil chemistry will allow for a recommendation to be made that will address the correction of the deficiency as well as address other potential issues. An immediate corrective action to meet the Mg requirement of the crop could include the foliar application of a Mg fertilizer.

If you would like to learn more about magnesium foliar application for conventional and organic crops, QualiTech can help. [Talk to a certified agronomist today.](#)