

Magnesium—Often Forgotten, but Most Essential

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Without photosynthesis, plant life would not exist. And without magnesium (Mg), there would be no photosynthesis. Plants could not produce our food, and hunger would become our number one concern.

Often the “forgotten nutrient,” Mg is the most essential of the 17 nutrients needed for plant growth. It is a vital team player working with other nutrients and is essential for top-profit crop production.

Contributions to plant growth

As the central ion in the chlorophyll molecule, Mg is essential for photosynthesis. It works with phosphorus (P) to transfer energy needed within the plant for growth, and it works with nitrogen (N), sulfur (S) and potassium (K) to build quality protein. Seed formation requires both Mg and P.

Crop and soil needs for Mg are science based

Soil tests are the most reliable way to determine Mg availability from soil reserves. The soil’s Mg status should be updated whenever pH, P and K levels are checked. Remember, crop response to fertilizer Mg occurs most often on acidic, low-exchange-capacity soils that are low in organic matter and soil test Mg.

Plant analysis can help to detect a shortage of Mg. Sample the whole plant at the seedling stage for corn, small grains or soybeans. As plants approach their reproductive stage, specific leaves become a better measure of the Mg status. For many crops, a rule of thumb is to sample the youngest fully mature leaves. If possible, collect a soil sample at the same time and from the same area of the plant sample.

Increasing yields will require higher Mg levels

- Higher plant populations per acre will require more nutrients to meet growth needs.

- Increasing rates of needed K fertilizers will put greater stress on Mg absorption. This places more K ions in the soil solution to compete with Mg ions for uptake by plant roots.
- Root uptake difficulties brought on by soil acidity, by soil flooding or compaction, or by reduced-tillage practices.
- Greater removal of Mg from the field occurs due to increasing yields and multiple cropping. (Nutrient uptake values for individual crops are presented on page 12.)

Higher crop yield and quality

Magnesium’s contributions to yield and quality are both crop and site specific. Scientists in Minnesota, for example, pay special attention to the Mg status of forage crops to help avoid an Mg shortage in the diet of ruminant animals. Magnesium’s contributions to crop quality are seldom visible since it works behind the scenes regulating enzyme systems, producing sugars or helping with other vital crop activities. University specialists in the Southeast United States point out that a shortage of Mg is most likely for high-yield crops growing on acidic, sandy soils of the Coastal Plain.

Vegetable crops are often responsive to fertilizer Mg. For example, Mg improved the protein content of potatoes and reduced internal discoloration while increasing firmness. Color disorders in tomatoes were reduced by balancing Mg and K in the fertilization program.

Yield response has been noted for different crops growing on low-testing soils: 1) Mg increased potato yield from 6.7 to 8.7 tons per acre in Michigan; 2) 50 lbs/acre of Mg increased tomato yield from 16.5 to 20.3 tons/acre; and 3) Mg increased corn grain yield at three locations on low-Mg coastal plain soils.

To learn more about the role of magnesium in crop production, visit www.Back-to-Basics.net.

Time-proven source of Mg

Crop advisors often address the need for Mg by incorporating potassium magnesium sulfate (K-Mag[®]) into a balanced fertilization program. Also known as langbeinite or double sulfate of potash, K-Mag is sourced from ore beds deep beneath the earth’s surface. Langbeinite, an evaporite mineral, is one of the most soluble salts in the ocean. As a result, K-Mag is virtually 100 percent water soluble and the Mg, K and S it provides are immediately available to crops.

