



## Montag Manufacturing, Inc.

2737 Van Dorn Rd  
Milford, NE 68405

3816 461<sup>st</sup> Ave  
Emmetsburg, IA 50536

Phone: (712)-852-4572

Email: [info@montagmfg.com](mailto:info@montagmfg.com)

Website: [www.montagmfg.com](http://www.montagmfg.com)

# THE AGRONOMY CORNER

## MAGNESIUM

Another of the very important “minor” elements of crop nutrition is magnesium.

Like all of the minor elements, magnesium is not normally added through fertilization UNLESS you specifically target it. All of the main sources of the Big Three elements, nitrogen, phosphorus and potassium contain none of the minor elements. Because the minor elements are required for good plant health and development, as seen below, paying attention to their levels in the soil can be critical for good crop production.

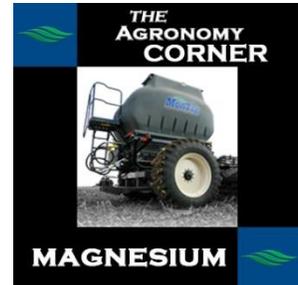
Magnesium’s main function in plant growth is as a critical component of chlorophyll. It has been estimated that magnesium makes up about seven percent of the chlorophyll molecule and chlorophyll cannot exist without magnesium. Without chlorophyll the plant cannot convert sun light to energy through photosynthesis and therefore would die.

Magnesium works hand in hand with phosphorus. Magnesium transports phosphorus within the plant to where phosphorus can perform all of its functions such as plant respiration and activation of many enzyme systems. Magnesium uptake is not possible without phosphorus and vice versa. Magnesium is involved in cell division and the formation of proteins.

Magnesium is found in most all soils and comes directly from the breakdown of native minerals. This slow process supplies some of the magnesium needed in crop production. However, high yielding crop production as well as leaching has depleted the native soil availability in some areas and supplementation is needed. It has been estimated that a 200 bu/ac corn crop with grain only removal removes 65 lbs per acre of magnesium.

The availability of magnesium can be strongly affected by the soil pH. Below 5.8, aluminum and hydrogen ions can interfere with magnesium uptake. Above pH of 7.5, calcium can override magnesium and limit its availability to the plant.

As mentioned in a previous Agronomy Corner on calcium, it should be kept in mind that calcium, potassium and magnesium interact with each other and a proper balance of each is required. An overabundance of one can lead to a shortage or reduction in uptake of another. Balancing these three nutrients is very important for good crop production.



As mentioned earlier, magnesium aids in phosphorus translocation and is easily moved within the plant. Therefore deficiency symptoms will first appear on old growth.

One of the best methods for checking for magnesium is the cation exchange capacity, CEC, of your soil. Low CEC soils have a low magnesium supplying capability. Keep in mind that adding limestone to improve CEC or pH can cause a magnesium deficiency unless the calcium to magnesium ratio is controlled. Again we refer you to your local agronomist or extension agency for your local conditions.

The best method of treating a deficiency of magnesium is to apply adequate amounts of magnesium to the soil to keep the soil level above 25 to 50 ppm (50 to 100 lbs/acre).

Sources of magnesium for agriculture are dolomitic limestone, K-Mag (potassium and magnesium), and other salts of magnesium like magnesium chloride, magnesium sulfate, etc.

Take Aways.

Pay attention to the amount of magnesium in your soils as it is necessary for plant life.

Balancing magnesium with other nutrients like calcium and potassium is very important to ensure that these elements stay balanced and do not cause issues with each other.

The source of lime can easily throw off the balance needed. Pay attention to the content of the lime you are using. Check with your local agronomy advisor or extension service.

A soil pH below 5.8 or above 7.5 will cause deficiencies of magnesium. Use the cation exchange capacity (CEC) test to make certain you have adequate magnesium for good crop production.

Modern high yielding crop production removes major amounts of magnesium which cannot be replaced by simple breakdown of native minerals. You must test for the element and add magnesium as needed to the soil.

Magnesium is mobile within plant tissue. Check for deficiencies in old growth.

Like other soil minerals, anything that can react with magnesium, and thereby reduce its availability to the plant, harms the growing plants. Think over application of other nutrients such as calcium and potassium, as well as chemicals that can tie-up minerals.

Links to the sources for this discussion:

<http://eldoradochemical.com/fertiliz1.htm>

<http://www.cropnutrition.com/efu-secondary-nutrients>