

Tech Shares

Magnesium is Mighty Good

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Why is magnesium important?

Magnesium (Mg) is a mobile, secondary essential element that is often ignored by growers. Mg plays a key role in a number of important plant structures and metabolic processes and is a critical part of the chlorophyll molecule which produces sugars for the plants and also makes foliage appear green. Mg is often present below optimal levels in most agricultural systems and this is true especially in container production. If it is not supplied at sufficient levels throughout the growth cycle, plant quality will definitely suffer.

When Mg is deficient, it can result in classical deficiency symptoms of interveinal yellowing that begins on older leaves (Fig. 1). While this can occur quite frequently, many growers experience Mg deficiency symptoms of a less dramatic nature. When Mg is slightly low in the root zone, this can result in stunting, delayed growth and pale green foliage color. These symptoms may be less obvious, since they may occur across the entire crop. The crop might appear uniform, but lack of sufficient Mg has cost you lost time and money.

How much Mg should I supply?

Irrigation water is the first place to look for Mg. Growers should always test their irrigation water especially for Calcium (Ca) and Mg baseline levels. This will help in developing a good fertilizer program that includes plenty of Mg. ICL Testing Lab's general recommendations for irrigation water are: 40-70 ppm Ca and 30-50 ppm Mg. Higher levels than this are fine as long as Ca and Mg remain in balance – the ideal ration of Ca: Mg is 2:1. From my experience most irrigation waters are low in Mg. When Mg levels fall below the general recommendation (30 ppm Mg), additional Mg should be supplied to the plants in the fertilizer.

Where can I get Mg?

Growing media or fertilizer program are the primary sources of Mg:

- Most growing media contains dolomitic limestone which can supply Mg to plants. Since lime is sparingly soluble, this will only provide low levels of Mg during the early crop phase.
- The growing media might also contain a starter nutrient charge which may contain some Mg, but again this small amount also will not support an actively growing crop for long.
- If water is low in Mg, you should select a fertilizer high in Mg or supplement your base Water Soluble Fertilizer (WSF) product.
- Many growers use Epsom salts (magnesium sulfate) to supplement Mg; four oz. of Epsom salts mixed into 100 gallons of hose-end solution will provide 30 ppm Mg. Magnesium sulfate is generally compatible in the same stock tank with most WSF formulations that do not contain Ca. Note: there is a current worldwide shortage of magnesium sulfate, so Epsom salts may be harder to source than usually.
- Magnesium nitrate is an alternate source of water soluble Mg and is highly compatible with other fertilizers.



Figure 1

Isn't there already enough Mg in my Water Soluble Fertilizer?

It depends on which WSF product you are using. There are so many formulations available in the marketplace and you really have to go beyond the N-P-K analysis on the bag. The best way to determine the Mg level in a product is to review the guaranteed analysis of the label or consult with your fertilizer supplier experts for recommendations. Be aware that many commonly used WSF fertilizers (e.g. 20-20-20 or 20-10-20) are very low in Mg and need to be supplemented with Epsom salts or Magnesium nitrate. Peters 20-10-20 is frequently used in a rotation with Peters 15-0-15 (which supplements both Ca & Mg).

Which WSF formulations should I use?

There are some high Mg formulations that do generally not require Mg supplement. Product selection will depend on whether there is a need for supplemental Ca as well. Consult your fertilizer expert if you need help with proper selection.

Cal-Mag products will provide N-P-K, Ca, Mg and micronutrients in one bag. If the goal is to provide a constant supply of these nutrients, this is a convenient option. Examples in table:

| Product | ppm Ca provided per 100 ppm N | ppm Mg provided per 100 ppm N |
|-----------------------------|-------------------------------|-------------------------------|
| Peters Excel 15-5-15 | 33.3 | 13.3 |
| Peters Excel 13-2-13 | 46.2 | 23.1 |
| Peters Professional 17-3-17 | 23.5 | 7.4 |
| Peters Professional 15-0-15 | 33.3 | 13.3 |

High Mag products provide N-P-K, Mg & micronutrients in one bag. These are appropriate to use when the irrigation water has plenty of Ca to provide a steady stream of Mg.

Examples in table:

| Product | ppm Mg provided per 100 ppm N |
|---------------------------------------|-------------------------------|
| Peters Excel pHLow 15-7-25 | 16.7 |
| Peters Excel 18-8-17 | 13.9 |
| Peters Professional 15-5-25 | 16.7 |
| Peters Professional 15-3-25 High Iron | 16.7 |

What If I already have a serious Mg deficiency?

Application of high concentrations of Epsom Salts of Magnesium nitrate can often mitigate symptoms of Mg deficiency especially if applied as soon as symptoms are detected. Mix 1 lb. of either compound in 100 gallons of water and drench thoroughly. In many cases one application will begin to reverse symptoms.

