

IT'S THE SOIL

LIMESTONE & DOLOMITE

Limestone (calcium carbonate) is a natural, mined soil amendment commonly used to raise the pH of acidic soils. In acidic soils with pH below 6, important nutrients such as phosphorous, calcium and magnesium become less soluble and therefore less available for uptake by plants.

Conversely, some nutrients become MORE available at lower pH, and can cause toxicity issues in plants and trees. These nutrients include iron, but also trace nutrients such as boron, copper, manganese and zinc.

SOIL AMENDMENTS & FERTILIZER

- Gypsum
- Limestone
- Dolomite
- Sulfur
- Compost
- Zeolite
- Custom Blends
- NPK Amendments
- Sulfate of Potash
- Solution Applicators
- Silos & Silo Repairs
- Soil & Water Testing



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BALANCING CALCIUM AND MAGNESIUM

Balancing soils for optimum fertility requires managing the ratios between key nutrients. One of the most critical ratios is calcium to magnesium. Depending on the exchange capacity (CEC) of the soil, the desired ratios of base cations is approximately 60-70% calcium and 12-16% magnesium.

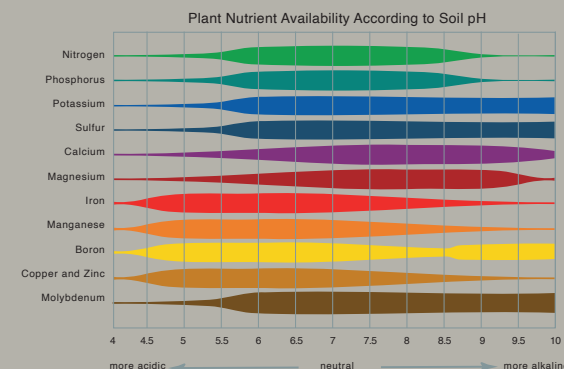
Soil particles like clay and humus (organic matter) carry negative charges on their surfaces due to their structure. These negative sites attract and hold positively charged cations like calcium and magnesium through electrostatic forces. This is the basis of cation exchange capacity (CEC). These cations are “adsorbed”

but can be exchanged with others in the soil solution (e.g., when plant roots take them up or other ions compete).

Calcium and magnesium have an ionic charge of +2, so they are held more strongly than monovalent (+1) ions like potassium (K^+) or sodium (Na^+).

Calcium and magnesium but can still participate in cation exchange, however. Calcium is often adsorbed more tightly than magnesium in many soils due to differences in hydrated radius and binding preferences (lyotropic series: $Ca > Mg$).

Chart 1



While magnesium is an important plant nutrient, excess levels of magnesium can monopolize multiple exchange sites on the soil particle, reducing the soil's nutrient-holding capacity and impacting soil friability and drainage.



Depending on the results of your soil test, it may be appropriate to add Limestone (calcium carbonate) or Dolomite (calcium magnesium carbonate) to your soil.

Limestone contains more calcium (approximately 30% total) than Gypsum (calcium sulfate). Limestone may be used either alone, or sometimes in conjunction with Gypsum, to increase calcium levels in the soil. The soil calcium level is important as a crop nutrient, for maintaining proper ratios between nutrients (especially magnesium), and improving soil structure.

A schematic look at cation exchange

