



Gypsum

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There is a lot of talk today about gypsum. **Gypsum is calcium sulfate** and can be a very economical source of both calcium and sulfur. It usually contains about **20% calcium and 15% sulfur**, both of which are essential crop nutrients.

Sulfur is needed for protein formation. It is also needed for the formation of chlorophyll and oils in the plant and plays a role in enzyme activation. Sulfur fertilization is much more important than in the past because of (1) higher yielding crops and (2) less sulfur available from the atmosphere since coal fired power plants have been forced to reduce their sulfur emissions over the last 30 years.

We said in the last *Ground Work* that calcium is important for soil tilth because it has the ability to flocculate clays in the soil. Gypsum, because it contains sulfur, can be particularly helpful at improving soil tilth as the sulfur helps the calcium displace excess magnesium in the soil.

Over time, gypsum applications can increase the base saturation of calcium and lower the base saturation of magnesium, allowing for **better soil structure and tilth**. We have seen this to be very beneficial on tight, high clay soils and soils with high magnesium content (over 20% base saturation).

Well flocculated soils have more pore space and therefore oxygen, which allows aerobic microbes to form soil aggregates that are the basis for good soil tilth. Remember, **good soil tilth is one of the backbones of biological farming**.

This chart reinforces the importance of calcium in flocculating soils. Dr. Jim Walworth from the University of Arizona, cited the following chart (with credit to Sumner and Nadi, 1998) in his presentation, "Soil Structure: The Roles of Sodium and Salts".

Ion		Relative Flocculating Power
Sodium	⁺ Na	1.0
Potassium	⁺ K	1.7
Magnesium	²⁺ Mg	27.0
Calcium	²⁺ Ca	43.0

Lime vs. Gypsum...

- Gypsum will not change soil pH, with the possible exception of soils with a pH of over 8.0. Therefore, if your pH is low, you need to **lime** to raise the pH regardless of how much magnesium your soil has.
- Because ag lime is not very soluble in soils with a pH of over 7.0, **gypsum** is a better source of soluble calcium in those soils than lime.
- Using **lime and gypsum together** in soils can have a very synergistic effect as these different calcium products react against each and create more energy than either one alone.

How much gypsum?

- Gypsum is typically spread in the fall at rates of 500-1000 pounds per acre and even up to one ton per acre for a first time application on a heavy clay soil.
- Gypsum should be left at or near the soil surface to help maintain soil porosity at the soil surface for improved water infiltration.
- Gypsum, like lime can be over applied. Over application of any calcium product makes it more difficult to maintain adequate levels of magnesium and potassium.

Lime and gypsum can both be great sources of soluble calcium. They both require a special trip. Pelletized gypsum, which is typically spread at 200-500 pounds per acre, can be blended with other fertilizers and spread with a dry fertilizer application.

Your **AgriEnergy Resources** representative is ready to help you decide which calcium program is the best fit for your farm. Call your rep today!