

Agriculture Gypsum

Calcium Sulfate Dihydrate $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$



Gypsum is a fertilizer product and supplies the crop-available form of calcium (Ca_2^+) and sulfur (SO_4^{2-}). If these forms are deficient in soil, then crop productivity will benefit if gypsum is applied.

Agricultural gypsum has a combination of calcium and sulfur for plant nutrition. Calcium is known for stimulating root growth. This makes gypsum a good fertilizer for crop soil. Gypsum can also reduce aluminum toxicity and can improve some acid soils even beyond what lime can do.

The chemical formula for gypsum is $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. Calcium sulfate (CaSO_4). Refined gypsum in the anhydrite form (no water) is 33 percent calcium (Ca) and 47 percent sulfur (S).

Dissolving gypsum in water or soil results in the following reaction: $\text{CaSO}_4 \cdot 2\text{H}_2\text{O} = \text{Ca}_2^+ + \text{SO}_4^{2-} + 2\text{H}_2\text{O}$. It adds calcium ions (Ca_2^+) and sulfate ions (SO_4^{2-}), but does not add or take away hydrogen ions (H^+). Therefore, it does not act as a liming or acidifying material. The Ca_2^+ ions simply interact with exchange sites in soil and sulfate remains dissolved in soil water.

Five key benefits of gypsum in agriculture



1. Source of calcium and sulfur for plant nutrition.

Gypsum is an excellent source of sulfur for plant nutrition and improving crop yield. Calcium is essential for most nutrients to be absorbed by plants roots as it stimulates root growth. Without adequate calcium, uptake mechanisms would fail.

2. Improves acid soils and treats aluminum toxicity.

One of gypsum's main advantages is its ability to reduce aluminum toxicity, which often accompanies soil acidity, particularly in subsoils. Gypsum can improve some acid soils even beyond what lime can do for them, which makes it possible to have deeper rooting with resulting benefits to the crops. "Surface-applied gypsum leeches down to the subsoil and results in increased root growth.

3. Improves soil structure.

Soluble calcium enhances soil aggregation and porosity to improve water infiltration. "It's important to manage the calcium status of the soil, it's as important as managing NPK."

In soils having unfavorable calcium-magnesium ratios, gypsum can create a more favorable ratio. "Addition of soluble calcium can overcome the dispersion effects of magnesium or sodium ions and help promote flocculation and structure development in dispersed soils.

"Agricultural soils have been degraded by centuries of farming practices that disturb soils' physical properties and create imbalances in soil chemistry resulting in compromised soil biology. "As a result, many soils are no longer able to provide enough natural nutrition and adequate root environment for profitable crop growth. By restoring soil physical properties, gypsum facilitates the natural restoration of soil microbiological complexes which in turn improve soil structure and bring balance to soil chemistry."

4. Improves water infiltration. Gypsum also improves the ability of soil to drain and not become waterlogged due to a combination of high sodium, swelling clay and excess water. "When we apply gypsum to soil it allows water to move into the soil and allows the crop to grow well.

Better soil structure allows all the positive benefits of soil-water relations to occur and gypsum helps to create and support good soil structure properties.”

5. Helps reduce runoff and erosion. Agriculture is considered to be one of the major contributors to water quality, with phosphorus runoff the biggest concern. “Gypsum should be considered as a Best Management Practice for reducing soluble P losses, due to how gypsum interacts with phosphorus.

How to Apply Gypsum to Soil



Gypsum can serve as a soil amendment, providing a source of calcium, sulfur, and plant nutrients to your gardens or crops. It can also loosens dense soil structures like heavy clay soils and sandy soils by binding small clay particles in a process called flocculation to improve soil aeration and water movement. Additionally, gypsum improves soil aggregation, or the quantities of organic material or organic matter in the soil, which promotes root growth and can prevent blossom end rot. To utilize gypsum in your garden, try following these steps:

1. Test your soil. Gypsum works well in acidic soils, as it can correct an abundance of saline and decrease the toxicity levels of aluminum in the subsoil. It's therefore a good idea to first perform a soil test or soil analysis to determine your soil acidity. This will impact whether it's safe for your plants to use gypsum in your soil, as well as how much. For example, if your **soil pH** levels are below 5.0, adding gypsum can damage your plants.
2. Spread evenly. To move forward with adding gypsum to your soil, apply roughly one-half pound of gypsum per square foot of soil in your garden using a lawn spreader. Walk

back and forth with the tool to achieve an even spread. Avoid mixing gypsum directly into soil mixes, as it can result in an over-tilled garden and possibly even compaction—similar to the effects of overworking a wet clay soil.

- 3. Reapply as needed. You should apply gypsum only once per year, as it works very slowly in the soil. Always retest your soil before reapplying gypsum to see how your soil reacted to the previous application.

Weight	25 KG / 50 KG / 1250 KG
Product Type	Natural Gypsum
Color	97.5% White
Composition	Calcuim 33% / Sulpher 47% / Magnizium 3.6%