



Sulf-N® News

Not All Sulfur Sources Are Created Equal

How to compare ammonium sulfate with gypsum and elemental sulfur

Sulfur is rising up the ranks of essential nutrients needed for high-yield crop production, and many sources are available to choose from. Which one is right for you?

Q: What is the difference between using elemental sulfur and sulfate-based fertilizers on crops?

A: For best results, sulfur applications should be made in the sulfate form, as it is the only form immediately available to crop roots. Crops cannot take up elemental sulfur until it converts into sulfate, which doesn't start to happen until the soil temperature approaches 60°F.

Until then, sulfur-converting bacteria lie dormant, and elemental sulfur remains unavailable to crops.

Q: Do all sulfur fertilizers come in sulfate form?

A: No. While many fertilizers come in an all-sulfate form, some fertilizers only come in the elemental sulfur form, and some are a combination of elemental sulfur and sulfate.

Q: Are there any sulfur fertilizers that are 100% sulfate?

A: Yes. Sulf-N® ammonium sulfate contains 24 units of sulfur – all in the sulfate form. Gypsum, also known as calcium sulfate, contains 17 units of sulfur in its sulfate form.

Q: How do ammonium sulfate and gypsum differ?

A: While both materials contain 100% sulfate sulfur, there are key differences:

One is largely a fertilizer, and the other is largely a soil amendment. Sulf-N® ammonium sulfate is an established fertilizer in U.S. crop production, used for more than 60 years to supplement plant nutrition with readily-available forms of sulfur and nitrogen. Gypsum has historically been used in crop production as a soil amendment, where calcium is needed to reclaim sodic soils.

One provides nitrogen, and the other provides calcium. Sulf-N® ammonium sulfate is a readily-available source of sulfur that also supplies 21 units of nitrogen in the highly-stable ammonium form. Nitrogen and sulfur are the building blocks of protein, and work closely in the plant to support photosynthesis. Gypsum, on the other hand, supplies sulfur and calcium. Unlike nitrogen, which is critically needed in the majority of crop-producing soils, calcium is an element that most soils can supply in quantities that are more than enough for optimum crop yield.

One is highly soluble, and the other is slightly soluble. While Sulf-N® ammonium sulfate is highly soluble, gypsum is only slightly soluble, so sizing becomes critical.



Source: NCDA & CS Agronomic Division

Upper leaves of a corn plant before and after the application of Sulf-N® ammonium sulfate at a rate of 100 pounds per acre.

FERTILIZER	CHEMICAL FORMULA	ANALYSIS (N-P ₂ O ₅ -K ₂ O)	PERCENT SULFUR	SOLUBILITY
Ammonium Sulfate	(NH ₄) ₂ SO ₄	21-0-0	24	Very Soluble
Calcium Sulfate (Gypsum)	CaSO ₄ ·2H ₂ O	0-0-0	17	Slightly Soluble
Elemental Sulfur	S	0-0-0	88-98	Insoluble

Source: A525. Understanding Plant Nutrients: Soil and Applied Sulfur. (University of Wisconsin)

Ammonium sulfate provides double the plant nutrition. With 24 units of sulfate sulfur and 21 units of ammonium nitrogen, Sulf-N® ammonium sulfate is a high-analysis fertilizer offering 45 units of essential plant nutrition in every 100 pounds of product. Gypsum, by contrast, contains only 17 units of sulfate sulfur. The rest of the nutrient analysis – 22 percent – is calcium. As a result, gypsum can be considered a low-analysis fertilizer on the majority of crop acres, with calcium serving as “filler” and having little impact on crop yield.

Ammonium sulfate is more efficient to spread. Sulf-N® ammonium sulfate offers 45 units of total plant food, which makes more efficient use of your fertilizer bins. It is available in three grades to suit your business model:

- Granular grade for high-quality bulk blending
- Mid-grade for direct application
- Fluid grade for dissolving into solution

Sulf-N® ammonium sulfate is a time-tested source of nitrogen and sulfur fertilizer produced by Honeywell in Hopewell, Virginia. It has been tested at more than 30 land grant universities, and is supported by a dedicated team of agronomy specialists.

For more information on the use of Sulf-N® ammonium sulfate, [click here](#). Also feel free to contact [Mercedes Gearhart](#), Senior Agronomist for AdvanSix.

Contact AdvanSix

To learn more about the benefits of Ammonium Sulfate, visit [Advan6.com](#) or [SulfN.com](#) or call: 1-844-890-8949 (toll free, U.S./Can.) +1-973-526-1800 (international)

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The logo for AdvanSix, featuring the word "ADVANSIX" in a bold, sans-serif font. The letter "A" is stylized with a small blue dot above it.