

PLANT NUTRIENTS

AdvanSix Sulf-N® Ammonium Sulfate

Elemental Versus Sulfate: Crop Response Depends on Form of Sulfur

Sulfur fertilizers come in many forms, but sulfate is the only form that crop roots can absorb. Fertilizers like ammonium sulfate (21-0-0-24S) are readily available to crop roots. Elemental sulfur is not.

Before plant roots can absorb elemental sulfur, it must be transformed to sulfate. Dave Franzen, soil specialist for the North Dakota State University Extension Service, describes this transformation as a two-step process. First, elemental sulfur granules are broken down into very fine particles. Then, soil bacteria react with the particles, transforming them to sulfate.

Blending elemental sulfur with bentonite clay can speed up the first step of the process, says Franzen. With sufficient soil moisture, the clay absorbs water, expands and breaks the sulfur granules apart. Soil bacteria can then go to work on step two. But even with the aid of bentonite clay, the transformation from elemental to sulfate can take time. In one study, Franzen reports that it took two months for half of the elemental sulfur to transform to sulfate. The actual length of time depends upon soil moisture, temperature, and pH. Cool weather tends to slow the process.

A recent canola study demonstrates how crops respond to sulfate versus elemental sulfur.

Conventional Tillage Canola Yields

Rock Lake, North Dakota – 1996

	Sulfate S (20 lbs/acre)*	Elemental S (40 lbs/acre)**
	Lbs/Acre	
Side Slopes	1980	1290
Toe Slopes	1860	1470
Hilltops	1810	1260

* Sulfur supplied as ammonium sulfate (21-0-0-24S).

** Sulfur supplied as elemental sulfur formulated with bentonite clay.

Source: North Dakota State University.

Crop response to sulfate sulfur has also been documented in other crops. In a 1995 University of Minnesota study, the use of sulfate sulfur produced the highest yields on wheat, reports George Rehm, soil scientist with the University of Minnesota's extension service. Sulfate sulfur increased yields by 10 bushels per acre compared to a seven-bushel increase from a combination of elemental sulfur and bentonite clay.

Sulf-N® ammonium sulfate (21-0-0-24S) supplies all of its sulfur in the readily available sulfate form.

Contact AdvanSix

To learn more about the benefits of Sulf-N® Ammonium Sulfate, visit AdvanSix.com or SulfN.com or call: **1-844-890-8949** (toll free, U.S./Can.) **+1-973-526-1800** (international)

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