Sulf-N® Ammonium Sulfate

ADVANCING COTTON YIELDS

AdvanSix

Ammonium Sulfate Advantage

Healthy cotton needs both nitrogen (N) and sulfur (S) to form amino acids, proteins and chlorophyll – as much as 12 pounds of sulfur for every bale of yield. Soils low in organic matter, whether they are the sandy soils of the coastal plains or low-organic-matter silty soils in the Mississippi Delta, tend to be very low in sulfur. That is why sulfur fertilization is so critical to cotton production in these regions.

Common Southern Cotton Soils Respond Well to Fertilization

Ultisols, the highly-weathered soils that are the predominant soil group in the Coastal Plains, respond well to fertilization – including sulfur.

Image adapted from a map from the USDA - Natural Resources Conservation Service

Proper Balance is Critical

Because the cotton plant needs both nitrogen and sulfur to produce the components of foliage, seed and lint, it's important to keep the two companion nutrients in balance with each other. In fact, cotton that is deficient in sulfur may actually show symptoms of excessive nitrogen – a signal that the crop is accumulating nitrogen without being able to turn it into the proteins it needs to create yield. A cotton crop needs about a pound of sulfur for every 10 pounds of nitrogen.

See the Difference

Sulfur deficiency in cotton can look a lot like nitrogen stress, with leaves turning light green or yellow. Nevertheless, it is often possible to differentiate between the two based on the leaves' location within the plant. When plants are sulfur-deficient, the yellowing appears in new growth. When plants are nitrogen-deficient, the yellowing occurs first on older leaves.

Learn to recognize the warning signs early. Research shows that even cotton that recovers from sulfur-deficiency symptoms will experience a yield loss unless sulfur is applied by first bloom.

Sulfur deficiency in cotton causes yellowing of younger leaves in the upper canopy.

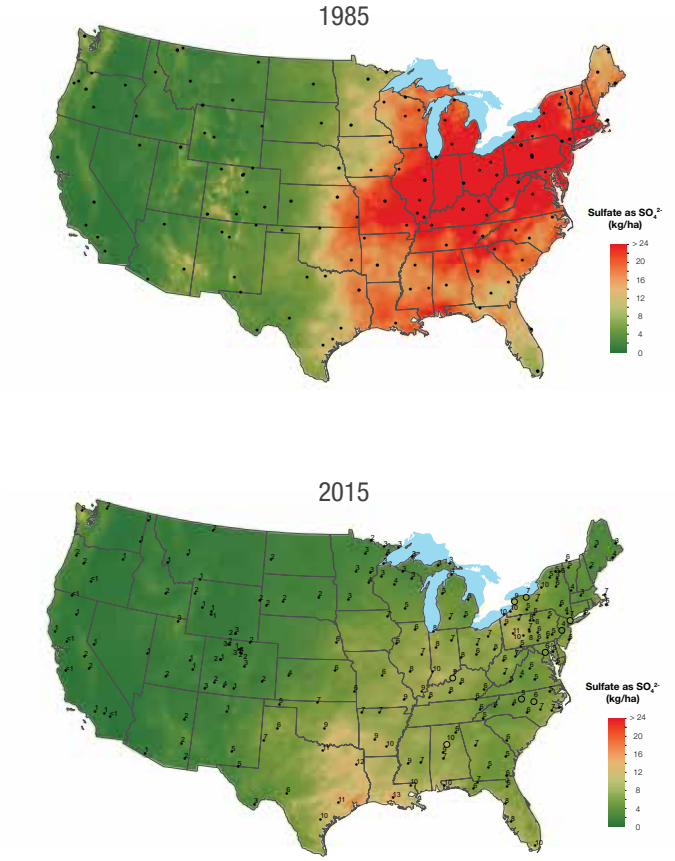
Plants deficient in sulfur are short, have few vegetative branches and develop small bolls.

Photos courtesy of Auburn University

Changing Sulfur Trends

Air pollution control has dramatically reduced the amount of “free” sulfur available to crops throughout the eastern half of the United States and Canada. This “free” sulfur originates from industrial emissions and eventually lands in growers’ fields, mostly as sulfates (see deposition maps below). This is a major reason why more sites and soil types are responding to sulfur fertilization.

Sulfate Ion Wet Depositions, 1985 versus 2015



National Atmospheric Deposition Program/National Trends Network
nadp.isws.illinois.edu

Meeting Demand for Sulfur

It is estimated that for every one percent of organic matter in its soil, a field can release two to five pounds of plant-available sulfur per year. Soils that are low in organic matter aren't able to meet crop needs. Coarse-textured soils may lose some of their sulfur as rainfall leaches it below the root zone. Cool, moist soils – conditions common in reduced-tillage fields – also slow down mineralization of soil organic matter, delaying sulfur's availability to the crop.

Sulfur deficiency symptoms may subside as tap roots reach the subsoil, but the crop will still experience yield loss unless sulfur is applied by first bloom.

Quick Correction

Sulf-N® ammonium sulfate fertilizer quickly corrects sulfur deficiency with 24 pounds of immediately available sulfate-sulfur per 100 pounds of product. Those same 100 pounds of Sulf-N® also contain 21 pounds of highly efficient ammonium nitrogen, which is more resistant to loss than the urea or nitrate forms.

Research Highlights

Independent research demonstrates the benefits of applying ammonium sulfate to cotton, especially in sulfur-deficient soils along the coastal plains or in the Mississippi delta, whether as straight material, in dry blends or in solution mixes.

Alabama. In a three-year study, 20 pounds of sulfur per acre increased cotton yields by 136 pounds per acre – 26% above the no-sulfur-added check plots.

Florida. Another three-year study showed 20 to 40 pounds of sulfur per acre increased cotton yields by an average of 35%. In a wet season, 40 pounds of sulfur improved yields by nearly a full bale per acre.

Georgia. In side-dress by the University of Georgia, where the crop had enough sulfur, the crop yielded an additional bale per acre (three bales versus just two in the sulfur-deficient plots).

Missouri. A three-year study at three sites demonstrated that soil-applied sulfur improved the nitrogen-to-sulfur ratio and increased lint yields on sandy soils.

North Carolina. Based on decades of on-field experience, North Carolina recommendations call for 20 to 25 pounds of sulfur per acre in coastal plains soils.

Virginia. Agronomists at Virginia Tech recommend 20 pounds of sulfur per acre for cotton following crops other than peanuts – either preplant, side-dressed or in split applications.

By including sulfur on the same schedule as nitrogen, Sulf-N® ammonium sulfate allows for a higher nitrogen-use efficiency.

Sulf-N® ammonium sulfate provides 21 pounds of highly efficient ammonium-nitrogen and 24 pounds of readily available sulfate-sulfur in every 100 pounds of product. Maximize your cotton yields by including it in your starter and top-dress fertilizer programs.

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