



Sulf-N[®] News

Sulfur Is Vital to Nitrogen Fixation in Alfalfa

There is extensive research chronicling the importance of sulfur in improving the yields of a wide variety of crops, including forage legumes like alfalfa. For example, Iowa State University researchers demonstrated that applying 40 pounds of sulfur per acre doubled alfalfa yields in 2005, and nearly doubled them in 2006.¹

That's not much of a surprise. Sulfur is vital in the production of chlorophyll, which allows plants to convert sunlight into stored energy. It's also a building block of a wide range of amino acids, enzymes and proteins required for plant growth. Moreover, sulfur deficiency has also been shown to limit the presence and activity of soil-fixing microbes on the roots of alfalfa and peas², which further demonstrates how sulfur helps build yield in leguminous forages.

Here's how it works:

- Sulfur is a major component of ferredoxin, an iron-sulfur protein that nitrogen-fixing rhizobia use as a source of electrons in the process of converting atmospheric nitrogen and water into a molecule that can be stored in the soil
- Sulfur is a vital part of leghemoglobin, a red, blood-like protein that stores oxygen in root nodules and allows rhizobia to respire. Root nodules on sulfur-deficient legumes lack adequate supplies of leghemoglobin, and nitrogen fixation suffers as a result³
- Levels of other proteins and enzymes are depressed in root nodules where legumes are deprived of adequate levels of sulfur

The remarkable thing about legume forages, of course, is that they supply their own nitrogen (with the help of rhizobia). That means productivity in sulfur-deficient fields can be enhanced significantly by simply applying sulfur.

Ammonium sulfate, such as Sulf-N[®], is an outstanding source of sulfur for legumes because it provides sulfur in the plant-available sulfate form, together with loss-resistant and plant-available ammonium nitrogen. These two nutrients work hand-in-hand to help jumpstart the crop when nodules are still forming.

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

¹ Better Crops (2011). Vol. 95, No. 2

² Scherer, et. al. (2008). Biol Fertil Soils 44:909-916

³ Singh and Raj, (1988). Ann Agric Res 9:13-19

Contact AdvanSix

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