Dramatic response to sulfur application on alfalfa.
Photo taken May 23, 2006, in northeast Iowa. Photo courtesy: Brian Lang Iowa State University Extension

Sulfur works hand-in-hand with nitrogen to produce protein, boosting both forage yield and quality.

Ask your fertilizer dealer or visit **www.sulfn.com** for more information.

Honeywell Resins & Chemicals
P.O. Box 1559
Hopewell, VA 23860
Phone: 804-541-9411
Fax: 804-541-9418
www.sulfn.com

Honeywell

Honeywell Sulf-N® Ammonium Sulfate

performing, field after field

Honeywell

Ammonium Sulfate Advantage

In field after field, the yield advantage goes to fertilizer programs that include Honeywell Sulf-N® ammonium sulfate fertilizers. Sulf-N fertilizers satisfy the growing need for sulfur and supply ammonium, a more efficient nitrogen form that is immediately available for root uptake and resists loss from leaching, volatilization and denitrification.

A Better N Form

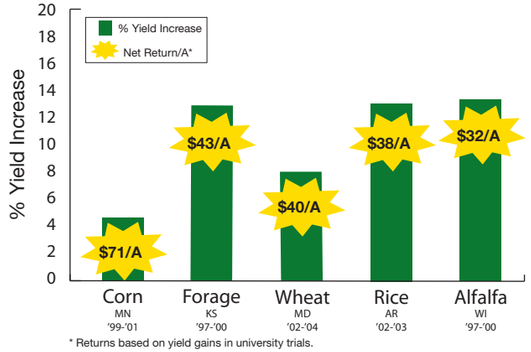
Nitrogen enhances yield more than any other fertilizer nutrient, so why not use the best form for your crop? Ammonium-rich Sulf-N nitrogen is immediately available for root uptake while resisting the three major pathways of N loss.

Less leachable. Positively charged ammonium ions bind to negatively charged soil ions, making Sulf-N fertilizers less susceptible to leaching.

Resists volatilization. Urea-based fertilizers should be incorporated to minimize volatilization loss, but is not necessary with Sulf-N fertilizers on the majority of soil types.

Not affected by denitrification. The denitrification process that can cause nitrate loss in poorly drained soils does not affect the availability of ammonium.

Honeywell Sulf-N® fertilizers deliver real agronomic value



* Returns based on yield gains in university trials.

Even when field conditions may cause other N sources to fail, Sulf-N® fertilizers resist N loss, optimize root uptake, and support maximum yield potential.

Did You Know?

- Crop roots take up nitrogen as nitrate and ammonium, and many crops actually prefer a combination of the two.
- Sulf-N ammonium nitrogen is immediately available for root uptake.
- Sulf-N fertilizers can be surface applied on most soils with very little risk of volatilization loss – even when broadcast in reduced tillage systems or topdressed on grasses.
- Sulf-N nitrogen can improve uptake of phosphorus and key micronutrients, often performing as well or better than more expensive phosphate blends in corn starter on high P soils.
- Sulf-N ammonium sulfate supplies sulfate sulfur – the only form immediately available for root uptake.
- Clean air initiatives will continue to reduce sulfur dioxide emissions in the U.S., with a 70% reduction expected by 2015.

Changing Sulfur Trends

More soil types are running short of sulfur as clean air initiatives promote low-sulfur fuels and drastically reduce the amount of "free" sulfur coming from industrial emissions. From 1996 – 2006, the electric power industry has cut sulfur emissions by 40%. Antipollution initiatives are calling for a 70% reduction by 2015. Deficiencies are now occurring on sands, loams, silts, and even some clays. Planting crops earlier or with less tillage increases the risk of sulfur deficiency because cooler soils inhibit sulfur release from organic matter.

First responder. Sulfur deficiencies are spreading to new areas and alfalfa is often the first crop to exhibit deficiency symptoms. If your area has sulfur deficient alfalfa, it's a good indicator that other crops will follow.

Special needs for corn. Earlier planting and reduced tillage are two growing trends that are creating a special need for early-season sulfur application to corn. Soils are now significantly cooler at planting and take longer to warm up. This slows the release of sulfur from organic matter and leaves young seedlings susceptible to deficiency — even in more fertile soils. Honeywell Sulf-N® ammonium sulfate supplies readily available sulfate sulfur and makes an excellent preplant or starter application.

Wheat. Shallow-rooted crops like winter wheat often don't get enough early-season sulfur. Add ammonium sulfate to topdress blends to maximize yield potential.

Research Highlights

KANSAS
Soil type: silt loam
Crop: no-till corn
Yield advantage: 17.5 bu/A
1999 – 2000

IOWA
Soil type: loam and silt loam (northeast)
Crop: Corn
Yield advantage: 15 bu/A
2007

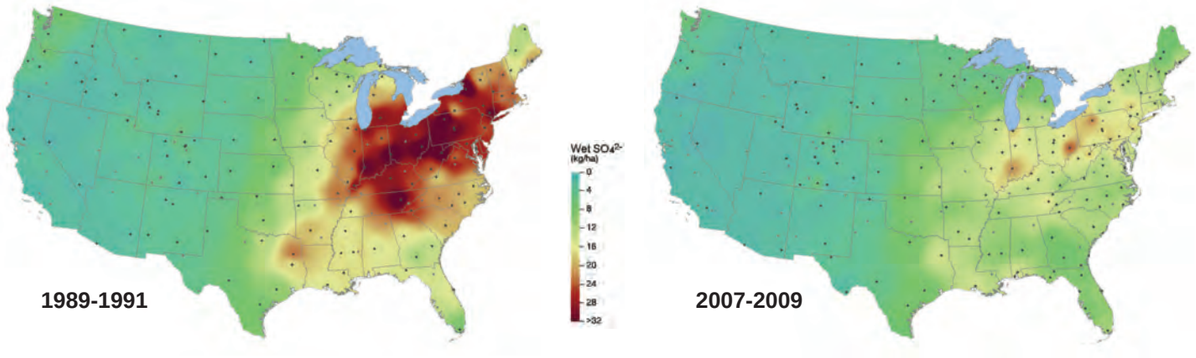
Soil type: loamy sand and sandy loam (northeast)
Crop: Corn
Yield advantage: 25 bu/A
2007

MINNESOTA
Soil type: silt loam
Crop: ridge-till corn
Yield advantage: 17 bu/A
2001

MISSOURI
Soil type: silt loam
Crop: rice
Yield advantage: 16 bu/A
2003 – 2004

NEW YORK
Soil type: gravelly loam
Crop: no-till corn silage
Yield advantage: 0.3 T/A
2003

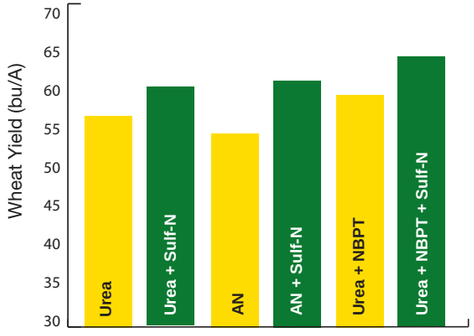
Airborne Sulfur Deposition



Clean Air initiatives have reduced atmospheric sulfur deposition, leading to S deficiencies in new areas.

U.S. EPA

Honeywell Sulf-N® ammonium sulfate blends improve wheat yields



Silt loam soil; N rate of 80 lb N/A; S blends to supply S needs. All treatment broadcast @ Feekes' GS 3 to 4. Maryland, 2004

Shallow-rooted crops like winter wheat often don't get enough early-season sulfur and may be slow to green-up when topdressed with straight nitrogen.

Do Your Crops Need Sulfur?

Sulfur deficiencies are now occurring on more soil types. Your fields could benefit from Honeywell Sulf-N® ammonium sulfate.

- ***Do you plant row crops early?***
  Cool soil temperatures inhibit sulfur release from organic matter.
- ***Are you farming with less tillage?***
  No-till, ridge-till and other reduced tillage systems delay soil warm up and interfere with sulfur release from organic matter.
- ***Do you fertilize with manure?***
  Without organic matter from manure, potential deficiencies are more likely. Check fields farthest from your barns.
- ***Are you seeing low sulfur levels in animal feed rations?***
  This could be an indicator of sulfur deficiency in fields where silage is grown.
- ***Have you noticed that crops are slow to green up after emergence – or some parts of your fields are lighter than others?***
  Sulfur availability tends to vary within fields. Crops may "outgrow" early-season deficiency, but usually not before yields have been affected.
- ***Are your soils eroded?***
  Eroded soils have less organic matter and less sulfur.
- ***Are your soils sandy or well-drained?***
  Low organic matter levels contribute minimal amounts of S and above-average rainfall can cause significant leaching.
- ***Are your fields getting less sulfur from the atmosphere?***
  Soils that used to get enough sulfur from industrial emissions are now at greater risk of deficiency due to cleaner-burning fuels.