



Reducing Volatilization



AGROTAIN is a *Stabilized Nitrogen™* fertilizer additive that reduces nitrogen volatilization loss when added to Urea Ammonium Nitrate (UAN) liquid fertilizer (28, 30 or 32%).

AAPFCO (Association of American Plant Food Control Officials) defines urease inhibitor as a substance which inhibits hydrolytic action on urea by urease enzyme. When applied to soils, a urease inhibitor results in less urea nitrogen lost by ammonia volatilization. (Official 1997).

N-(n-butyl) thiophosphoric triamide (NBPT) is commercially known as AGROTAIN – a compound that is the normal butyl derivative of thiophosphoric triamids and is a urease inhibitor. (CAS No. 94317-64-3, N-(n-butyl) phosphorothiole triamide). (Official 1997).

The only commercially available urease inhibitor as defined by AAPFCO is AGROTAIN; however, there has been confusion that Ammonium thiosulphate (ATS) – 12-0-0-26S can also reduce volatilization. Dr. Jack Bremner, Professor Emeritus at Iowa State University and a foremost authority on soil nitrogen, studied ATS, an excellent source of sulfur for plants, in his laboratory and concluded that it has little, if any, potential value for decreasing ammonia volatilization from urea fertilizers in soil (Agronomy Abstracts, 1990 and personal communication, July 1999).

In lab tests conducted by Dr. Willis Thornsberry Jr., a consultant chemist at Sturgis, Kentucky, NH₃ losses from soil during a 30 day period were about the same for UAN and UAN-ATS solution (80.75:19.25% or 28-0-0-5S). Cumulative loss of NH₃ from each was about 70 to 75% of the N applied. By contrast, cumulative losses with AGROTAIN present were about 25 to 27%. He concluded that the presence of ATS did not significantly retard ammonia losses.

Research conducted by Dr. Cindy Grant and Dr. L.D. Bailey with Agriculture and Agri-Food Canada at the Brandon Research Center concluded in a 1997 report on urease inhibition for wheat production under a reduced tillage system that UAN produced higher yields when applied with AGROTAIN as compared to with ATS, whether broadcast or dribble-banded, although the greatest differences occurred with broadcast application.

“The effectiveness of ATS as a urease inhibitor is questionable, particularly when compared to a highly effective urease inhibitor such as AGROTAIN,” quoted Dr. Wilbur Frye and Dr. David Terry.

AGROTAIN reduces nitrogen losses, which improves nitrogen use efficiency and enhances yield and profit potential. Research shows that AGROTAIN-treated UAN outperforms untreated UAN.

In independent research trials, AGROTAIN treated UAN had lower volatilization losses and higher yields than UAN alone. The results speak for themselves: AGROTAIN increases nitrogen use efficiency and results in better yields and higher profit potential.

- **Agriculture and Agri-Food Canada:** Dr. C.A. Grant, University of Manitoba - C Rawluk and G. Racz: Even with the addition of water to simulate irrigation, use of AGROTAIN reduced volatile loss of ammonia by 50% to 90% compared to the untreated UAN.
- **University of Maryland:** Applications made before crop emergence yielded a 10 bu/acre increase with the addition of AGROTAIN to UAN.
- **IOWA** - Agricultural Custom Research Service: Yields with applications of AGROTAIN to UAN were increased by 8 bu/acre on no-till corn.
- **University of Kentucky:** A four-year study on no-till corn found AGROTAIN was apparently quite effective in inhibiting urease activity and decreasing ammonia volatilization loss of N from urea.
- **Auburn University:** The laboratory study on a loamy sand indicated that AGROTAIN is an effective and potent urease inhibitor in controlling NH₃ volatilization over several pH levels.

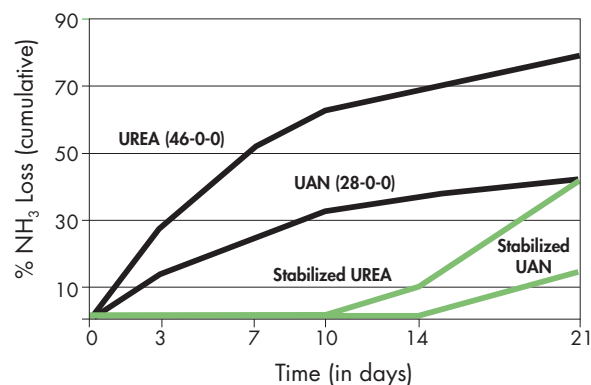
Testimonials from AGROTAIN users:

Richard Szwydyk P.Ag. - Soil Conservation Agrologist, Saskatchewan Soil Conservation Association:

"I had used AGROTAIN quite extensively in 2003 as part of a greenhouse gas mitigation project. In this demonstration we seed placed AGROTAIN treated urea at various rates with wheat and flax. Our results concur with the label, that we can safely seed place 50% more urea with the seed when treated with AGROTAIN. The increase in fertilizer usage allowed yields to be maximized. Fertilizer rates in excess of 50% showed significant reductions in plant counts, increased weed competition, delayed maturity and reduced yields."

Jeremy Baltz - Grower, Pocahontas, AR:

"I started using AGROTAIN in 2002 and I use it on my rice, corn, wheat and pasture. Buying urea without AGROTAIN would be like buying a tractor without a cab. You just wouldn't do it any more."



Assumptions: Adequate moisture and drying conditions; Soil Conditions: 30% Residue • pH of 7.0; AGROTAIN rate: UAN - 2.1 l/MT • Urea - 4.2 l/MT
Source: International Fertilizer Development Center (IFDC).



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