International Conference on Enhanced-Efficiency Fertilizers

An IFA-New Ag International Event
23-24 March 2010
Hotel Hyatt Regency, Miami, FL, USA

ENHANCED EFFICIENCY NITROGEN FERTILIZERS FOR CORN AND WHEAT PRODUCTION

Gregory J. SCHWAB
University of Kentucky, USA

International Fertilizer Industry Association

NEW AG INTERNATIONAL

Enhanced Efficiency Nitrogen Fertilizers for Corn and Wheat Production

Gregory J. Schwab and Lloyd W. Murdock

University of Kentucky, Department of Plant and Soil Sciences

AGROTAIN® Improved Nitrogen Efficiency

NBPT – Urease Inhibitor

AGROTAIN® PLUS Dry Concentrate

NBPT – Urease Inhibitor
DCD – Nitrification Inhibitor
For use in UAN

SuperU® Stabilized Nitrogen™

NBPT – Urease Inhibitor
DCD – Nitrification Inhibitor

ESN SmartNitrogen Controlled Release Fertilizer

Polymer Coated – Controlled Release

NutriSphere-N

Maleic-itaconic copolymer, calcium salt

Dow AgroSciences N-Serve® Nitrogen Stabilizer

*Trademark of Dow AgroSciences LLC

Nitrapyrin – Nitrification Inhibitor

For use in Anhydrous Ammonia or incorporated urea

Dow AgroSciences Instinct™ Nitrogen Stabilizer

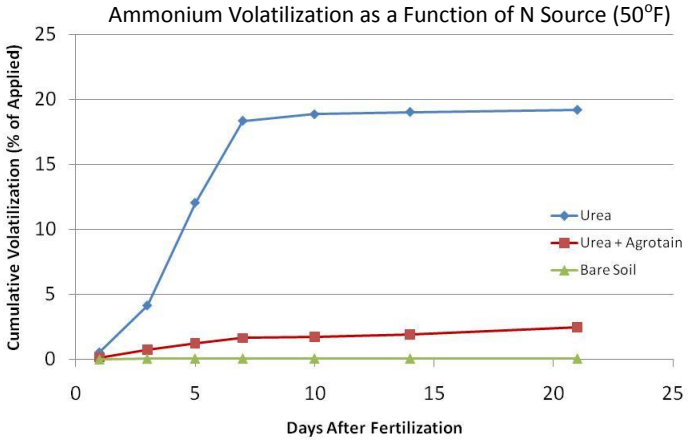
™Trademark of Dow AgroSciences LLC

Nitrapyrin – Nitrification Inhibitor

Lower volatility than N-Serve

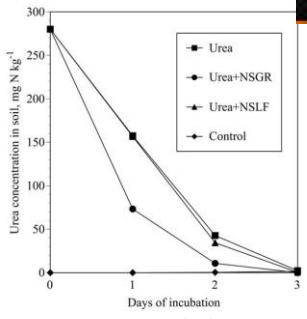
AGROTAIN
Improved Nitrogen Efficiency

Ammonium Volatilization as a Function of N Source (50°F)

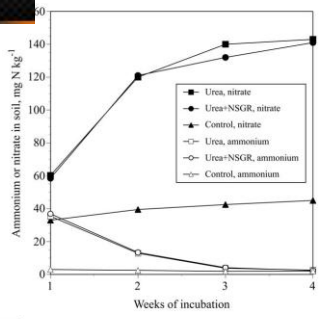


(Guertal, Personal Comm.)

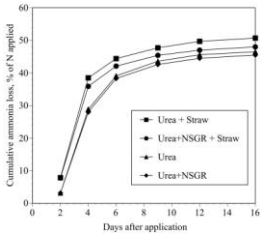
NutriSphere-N



Urea Hydrolysis



Nitrification



Volatilization

(Goos, 2009)

Kentucky Studies – Materials and Methods

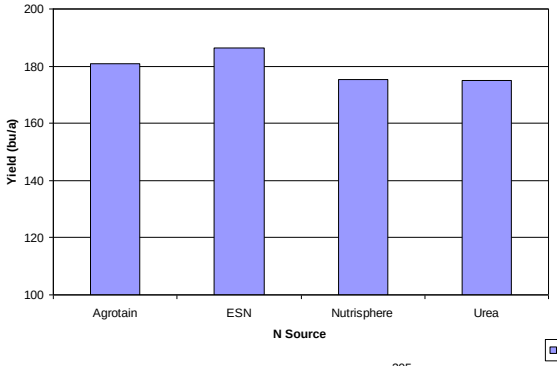
All conducted under worst case conditions

Volatilization

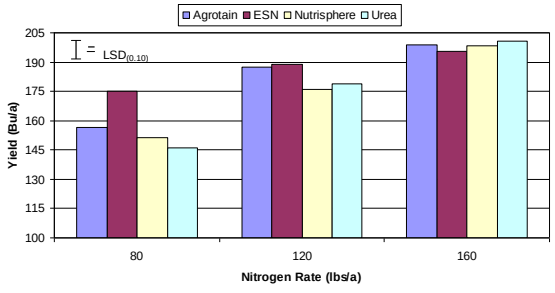
- Wet soils
- No-till – high residue
- Drying period

Denitrification

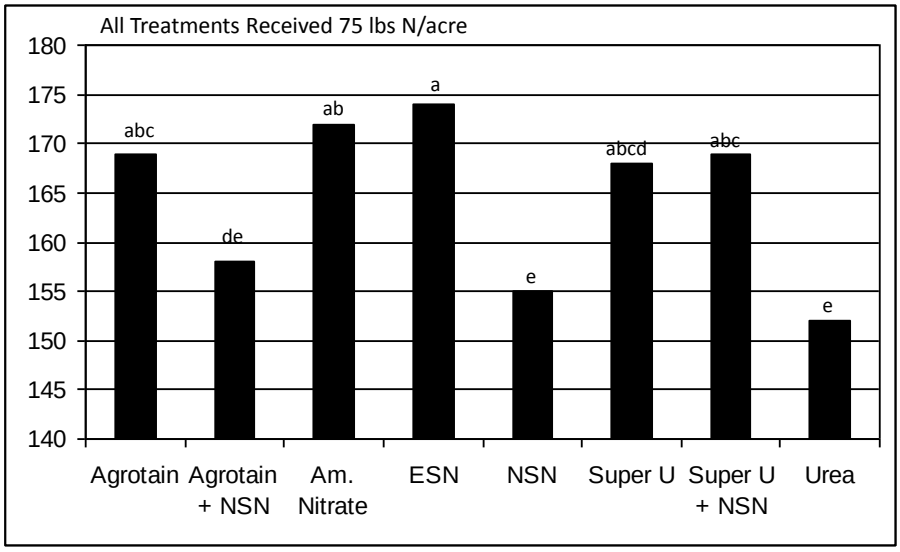
- Poorly drained
- High seasonal rainfall



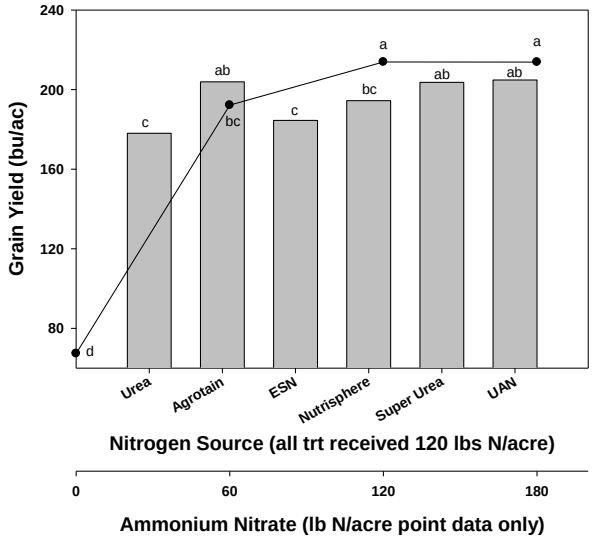
Quicksand, KY 2006



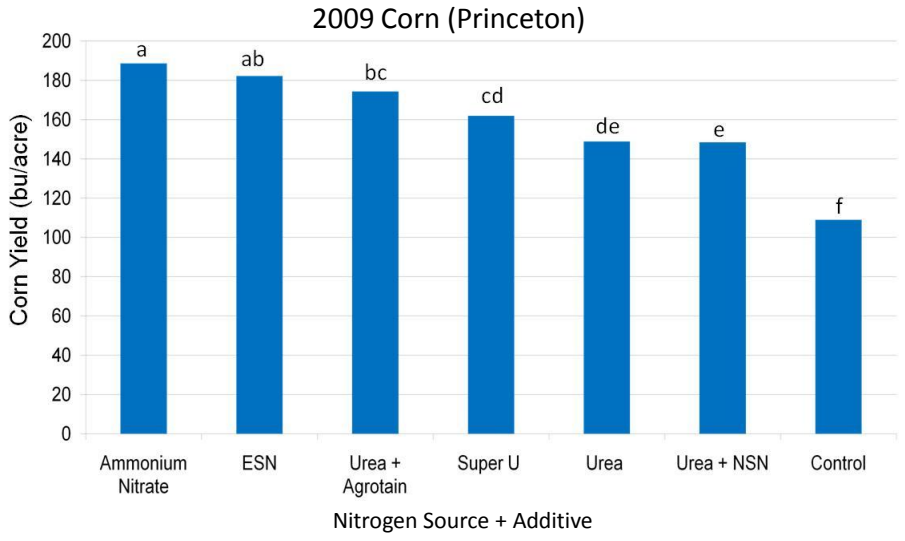
2007 N volatilization Study (Princeton, KY)



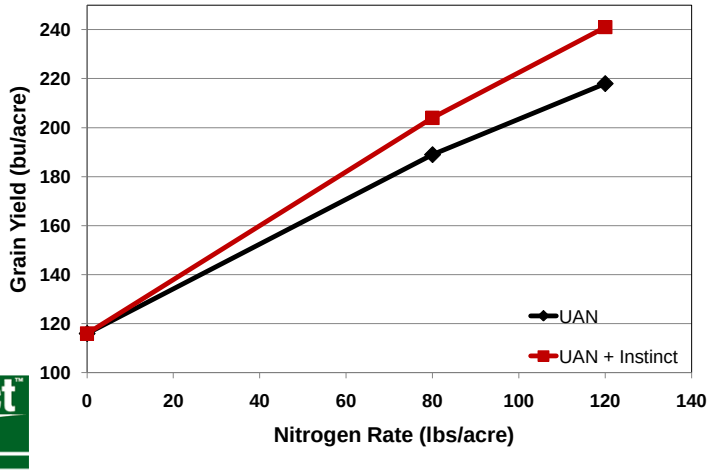
2007 N volatilization Study (Quicksand, KY)



Nitrogen Stabilizers

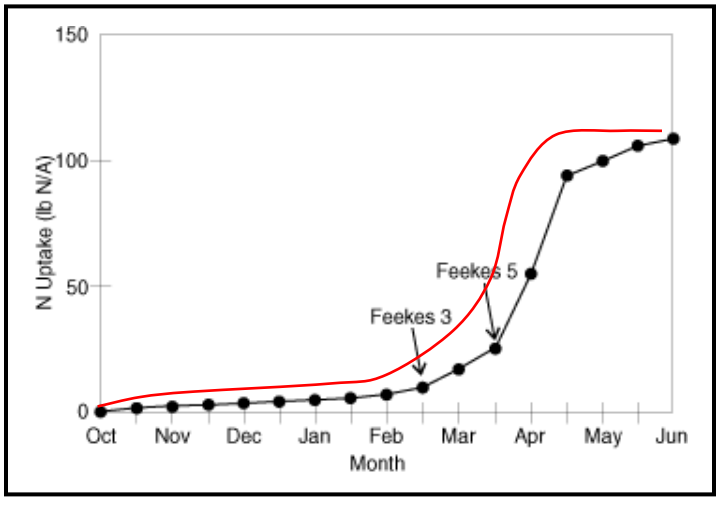


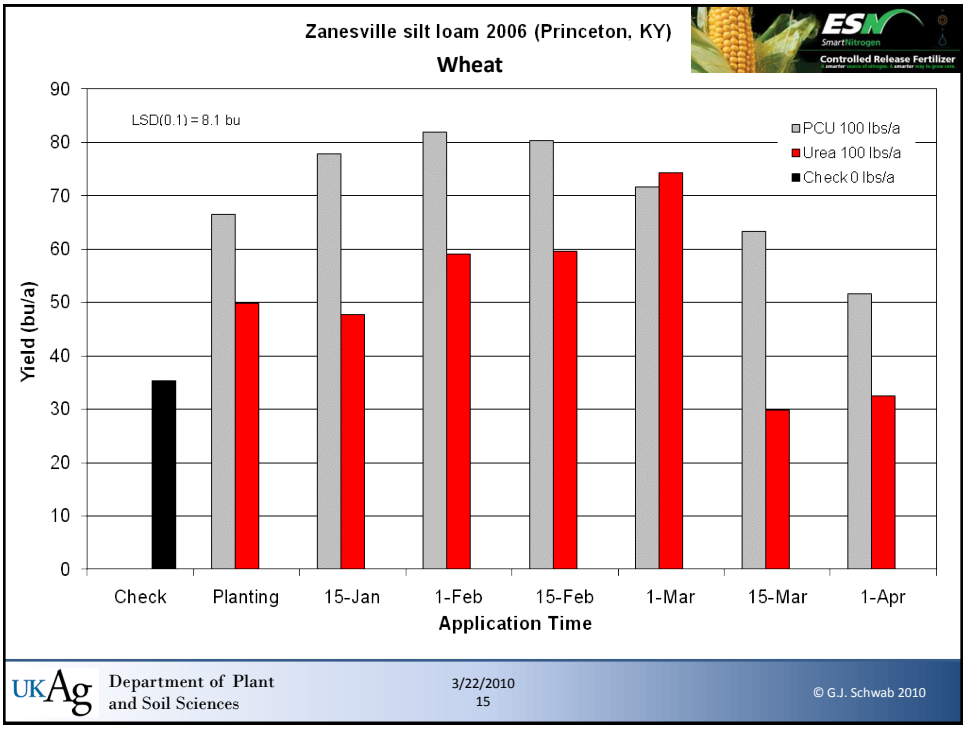
2009 Lexington Nitrification Study



Dow AgroSciences Instinct™ Nitrogen Stabilizer

"Ideal" Slow release fertilizer





CONCLUSIONS

- Agrotain, Super-U, and ESN all are effective when loss volatilization conditions are high
- Nutrisphere-N's effect on Volatilization is less predictable – Not effective in Kentucky
- Instinct appears to be as effective as N-Serve when denitrification potential is high
- ESN is effective at extending the N application window for wheat production