New Nitrogen Stabilization Options with Maleic Itaconic Acid Copolymer Formulations

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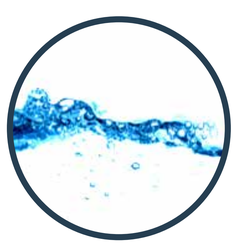
Abstract

Maleic Itaconic Acid Copolymer (MIAC), which is commercialized under the trade name NutriSphere-N®, has been commercialized for >9 years, its been used on >14M hectares, and >83% of growers who use MAIC, have used it again in the subsequent year. This unique N stabilization chemistry has been shown to increase grain yield in corn and wheat by stabilizing N against volatilization and leaching losses. Historically, growers had the option for either treating dry fertilizers such as urea or liquid fertilizers such as UAN (urea-ammonium nitrate) with MAIC. Two new formulations have recently been commercialized. The first of these is NutriSphere-HV® (high volume) and its primarily used to stabilize N applied in high volume liquid applications (>280 L/ha). The other new formulation is NutriSphere-NH3® and its injected concurrently with anhydrous ammonia using advanced dual-injection equipment. Growers now have options for stabilizing all popular forms of N fertilizer with MAIC, thereby generating greater yield and improving environmental sustainability by reducing N loss. 2015 Field Trials are summarized below.

NutriSphere-NH_3®

NutriSphere-N QDO®



NutriSphere-N HV®

Background

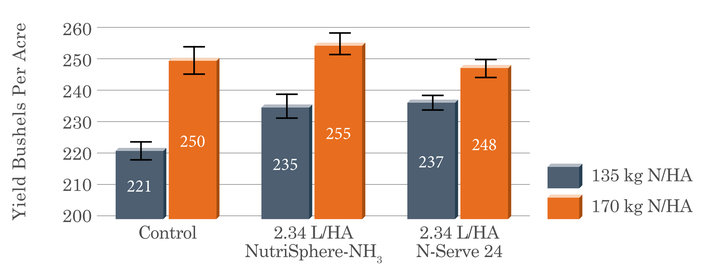
There has been much debate regarding the mode of action of maleic Itaconic Acid Copolymers (MAIC) and some skepticism in the agronomic research community, but several peer-reviewed publications are available for consideration that demonstrate the benefits of the MAIC products for stabilizing N against loss:

- Under a wet precipitation regime, Peng et al[1] demonstrated a reduction in NO_3 leaching equivalent to Nitrapyrin and demonstrated a reduction in NH_3 volatilization relative to a fertilized control
- Mahal et al[2] demonstrated reductions in N_2O emissions versus a fertilized control
- Many practitioners have also demonstrated an improvement in yield with the use of MAIC products on various crops[3,4,5,6]

Control

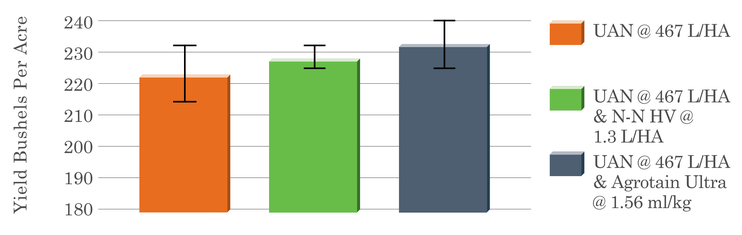
UAN with NutriSphere-N HV

Anhydrous-NH3 Fall Applied (Whitewater, WI)



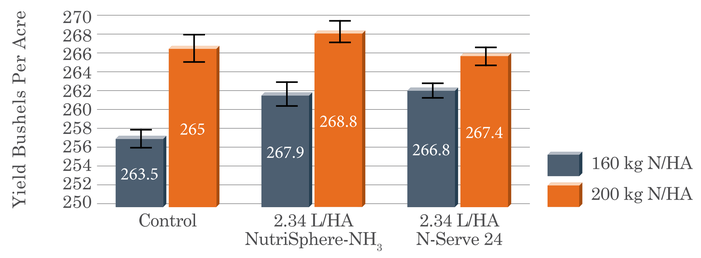
4 replications in RCBD, Rotation was corn following soybeans; Conv. tillage; 32,000 plant pop; loam soil

Corn Grain Yield (Bu/A) following UAN and N Stabilizers Applied Preplant Broadcast Incorporated (Troy, OH)



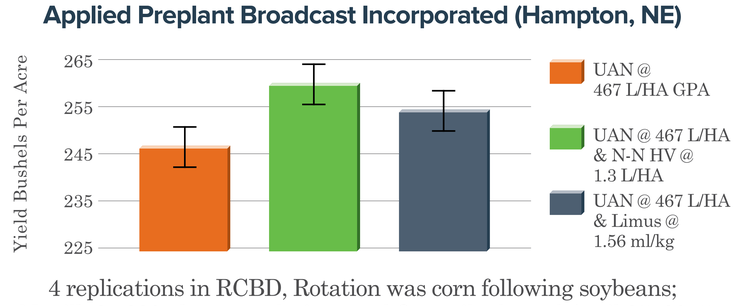
4 replications in RCBD, Rotation was corn following soybeans; Conv. tillage; 32,000 planting population; silt loam soil, planted May 28, 2015

Anhydrous-NH3 Spring Applied (Aurora, NE)

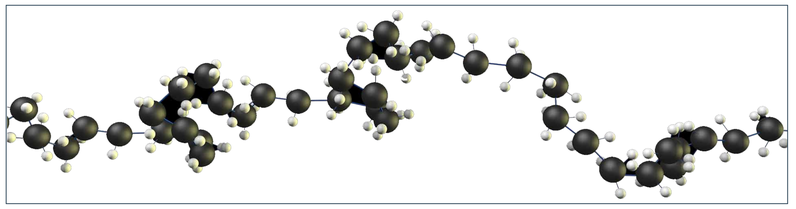


4 replications in RCBD, Rotation was corn following soybeans; Strip till; 34,000 plant pop; med/fine soil; planted May 5, 2015

Corn Grain Yield (Bu/A) following UAN and N Stabilizers Applied Preplant Broadcast Incorporated (Hampton, NE)



4 replications in RCBD, Rotation was corn following soybeans; No till; 34,000 plant population; med fine soil, planted April 25, 2015



Conclusions

The 2015 replicated field trials demonstrated improved N use efficiency and greater yield where MAIC (NutriSphere-N) was used to stabilize N and inhibit N loss. Research is on-going from 2016 to generate further results.

For more information about NutriSphere-N products, visit www.vlsci.com or contact one of the authors.

References

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