SERPENTINE®
NITROGEN STABILIZER

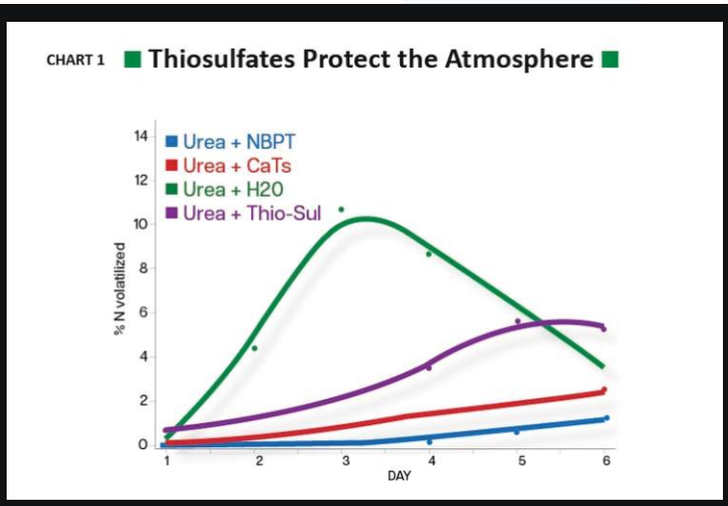
ABOVE + BELOW GROUND PROTECTION ⋎ NITROGEN STABILIZER
PROPRIETARY ACTIVATOR ⋎ ADDITIVE PACKAGE ⋎ PENETRANT TECHNOLOGY

SERPENTINE® NITROGEN STABILIZER vs. THIOSULFATE FERTILIZERS

by John D. Bailey, PhD, and
Jim Thomas, Director of Specialty Products

While we can all agree that it is essential for growers to find ways to protect the nitrogen they apply, there are differences in opinions about best practices, and which products offer the best nitrogen protection and ROI for the grower. Crop Excellence® offers the following information advocating **SERPENTINE®** Nitrogen Stabilizer, a NBPT-DCD combination nitrogen stabilizer product vs. Thiosulfate Fertilizers.

Excerpt from "Protecting Nitrogen with Thiosulfates: A New Look at a Legacy Product" by Dr. Ogles, Ph.D



Source: cropvitality.com

"A recent study shows that thiosulfates inhibit nitrification while providing essential sulfur... Thiosulfates have also been shown to reduce ammonia volatilization. Studies with liquid urea and NBPT (N-(n-Butyl) thiophosphoric triamide), a well-known product that's marketed as a urease inhibitor, the NBPT kept volatilization very low when compared to urea applied alone. But the study also showed that urea applied with calcium thiosulfate performed statistically as well as NBPT over the six-day period."

CROP EXCELLENCE® ANALYSIS

A few key pieces of information to put the study results above, in better perspective: One is that the study references a 6-day protection time frame, which is very limited and does not compare to the weeks-long protection that you can get from NBPT-DCD combinations. It is like putting the author of this document in the same category as a champion bull-rider because I can hang on for the first second of the 8-second ride. Yes, we perform the same, the champion bull-rider and me, for the first second of that ride, but once that bull bucks hard and spins once, I fly off and the champion holds on, NO CONTEST!

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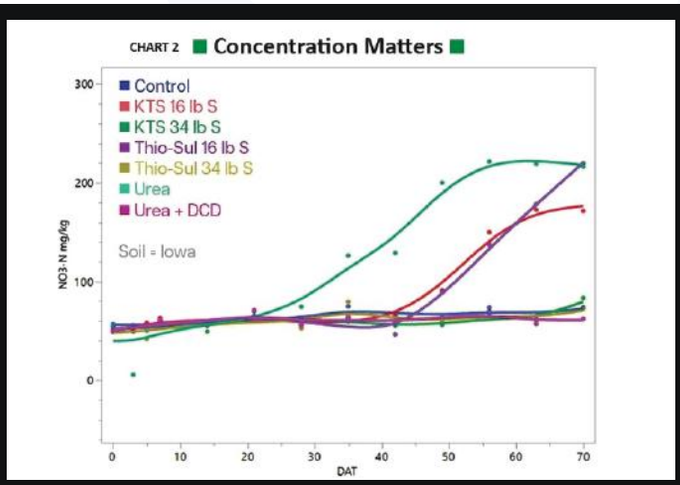

Source: cropvitality.com

"A joint study conducted by Auburn University and Crop Vitality from 2017-2023, revealed that concentrated applications of thiosulphates play a key role in nitrification inhibition. When urea solution was applied alone at a rate of 120 pounds of nitrogen per acre, the urea quickly hydrolyzed and converted to nitrate nitrogen. When thiosulfate sulfur or DCD (a commercially available nitrification inhibitor) was added to the urea solution, the rate of nitrification was effectively reduced. When a larger amount of thiosulfate sulfur (34 pounds per acre) is used with urea, we saw extremely good nitrification inhibition."

CROP EXCELLENCE® ANALYSIS

This study compares thiosulfates to DCD alone, and not NBPT-DCD combination product(s) like **SERPENTINE®**. While this study does go out further on the timeline, we would have to do the math as to how economical the rates of the thiosulfate products they are using might be. At 34 lbs/acre of sulfur, they are putting on 13+ gallons of thiosulfate product, which represents a significant cost, not just of product, but also of application "space" in the side-dress rig, which will lower efficiency in covering the acres needed.

The second important take away is the mode of action, which the study claims to be through acidification by the partial degradation of the thiosulfate to sulfuric acid. This mode of action can work for short periods of time, only if the soil and surrounding environment is alkaline. If you have neutral to acidic soils, like most of our growers, the value of acidification as a mode of action is very limited. It would be very interesting to see what pH of media was used in the trials.

CONCLUSION

Thiosulfate Fertilizers can provide short-term nitrogen efficiency value. However, in the field, we don't think they hold a candle to the stabilization of urea with an NBPT+DCD combination product like **SERPENTINE®**, especially in hot dry conditions.