

Use of Thiosulfates to Reduce Ammonia Volatilization Losses from Urea Fertilizers

John G. Clapp, Ph.D.
Director of Agronomy
Tessenderlo Kerley, Inc



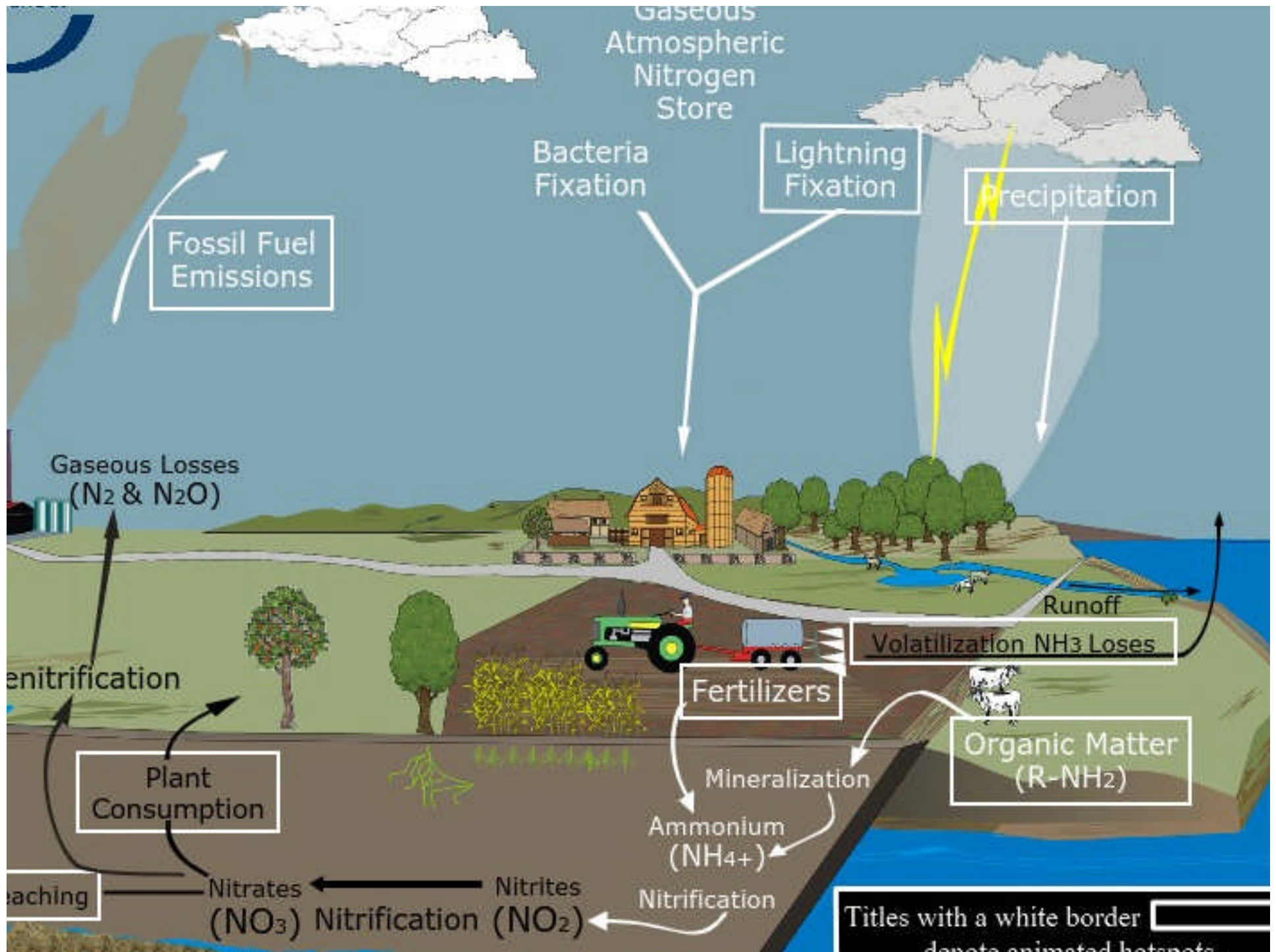
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Cooperating:

- **Michael Hojjatie, Ph.D., Director of R&D.**
- **Tom Fairweather, Agronomist-Specialty Ag.**



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Surface Urea Applications



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Urea Hydrolysis Inhibition of UAN

<u>% ATS in UAN</u>	<u>% Inhibition - 2 DAT</u>	
	<u>Williams loam</u>	<u>Bearden Scl</u>
0	0	0
1	20	15
2	28	30
5	45	35
10	50	45

Goos. North Dakota State University



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Urea Hydrolysis From UAN

<u>Treatment</u>	<u>% Urea Hydrolyzed</u> ^{1.}	
	<u>20°C</u>	<u>30°C</u>
UAN	33	60
UAN + ATS @ 10%	24	38

1. Average of 5 soils 96 hours after treatment

Sullivan. Kansas State University



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Ammonia Volatilization From UAN

<u>Treatment</u>	<u>Ammonia loss (mg N)</u>
UAN	49.81 c
UAN + ATS @ 10%	25.99 bc
UAN + NBPT @ .25%	16.54 b

b-c: significantly different at .05 level

Grant, et al. Brandon research center, Manitoba, Canada



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N and S Treatments Applied to Corn

<u>Treatment</u>	<u>Kg nutrient per ha</u>			
	<u>UAN-N</u>	<u>ATS-N</u>	<u>ATS-S</u>	<u>SSP-S</u>
1	250	---	---	---
2	240	10	23	---
3	250	---	---	23

Graziano and parents. Ceta, Italy



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Response of Corn to UAN and ATS

<u>Corn yield - T per ha</u>				
<u>Treatment</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>Avg</u>
1	6.2 B	10.5 B	9.5	8.7 B
2	8.1 A	12.2 A	11.1	10.5 A
3		11.7 A	9.9	

A:B significantly different at .01 level

Graziano and parents. Ceta, Italy



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Nitrogen Utilization From UAN and ATS

<u>Treatment</u>	<u>N uptake - kg per ha.</u>			
	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>avg.</u>
1	83 B	154 b	136	124 b.
2	118 A	179 a	150	144 a.
3		164 ab	156	

A-B: significantly different at .01 level.

a-b: significantly different at .05 level.

Graziano and parents. Ceta, Italy.



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Addition of Ca/Mg to Urea

- **Fenn, et al, Texas A&M published several paper illustrating that Ca and Mg in combination with urea can reduce ammonia volatilization losses significantly.**



TKI Thiosulfate Products

- **Thio-Sul (12-0-0-26S) Ammonium**
- **KTS (0-0-25-17S) Potassium**
- **CaTs (0-0-0-6Ca-10S) Calcium**
- **MagThio (0-0-0-4Mg-10S) Magnesium**

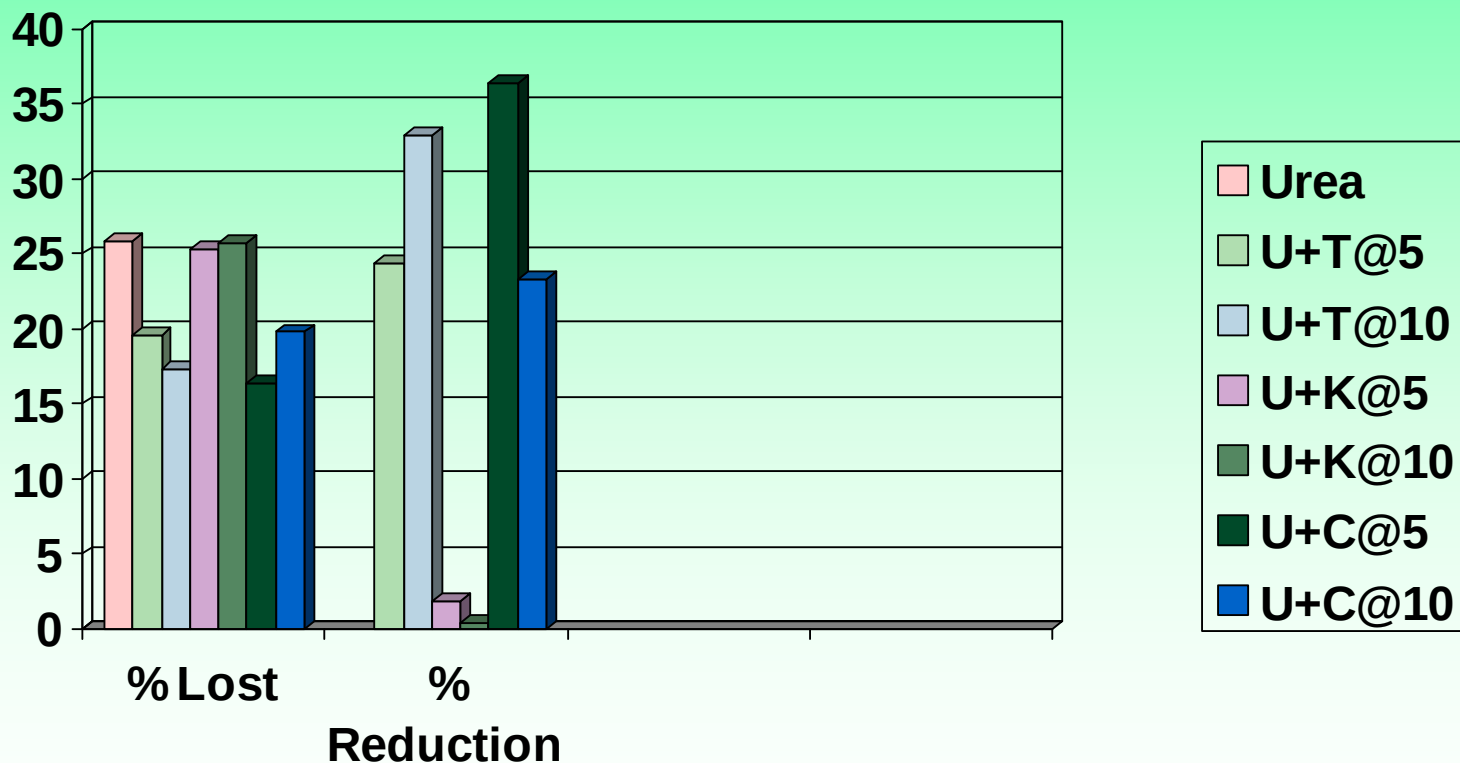


Addition of Thiosulfate Products to Urea Solution

- **Addition @ rates up to 10% v/v.**
- **N rate @ 100 lbs/acre.**
- **Soil pH 6.7**
- **Ammonia losses measured @ 2 and 7 days after application.**

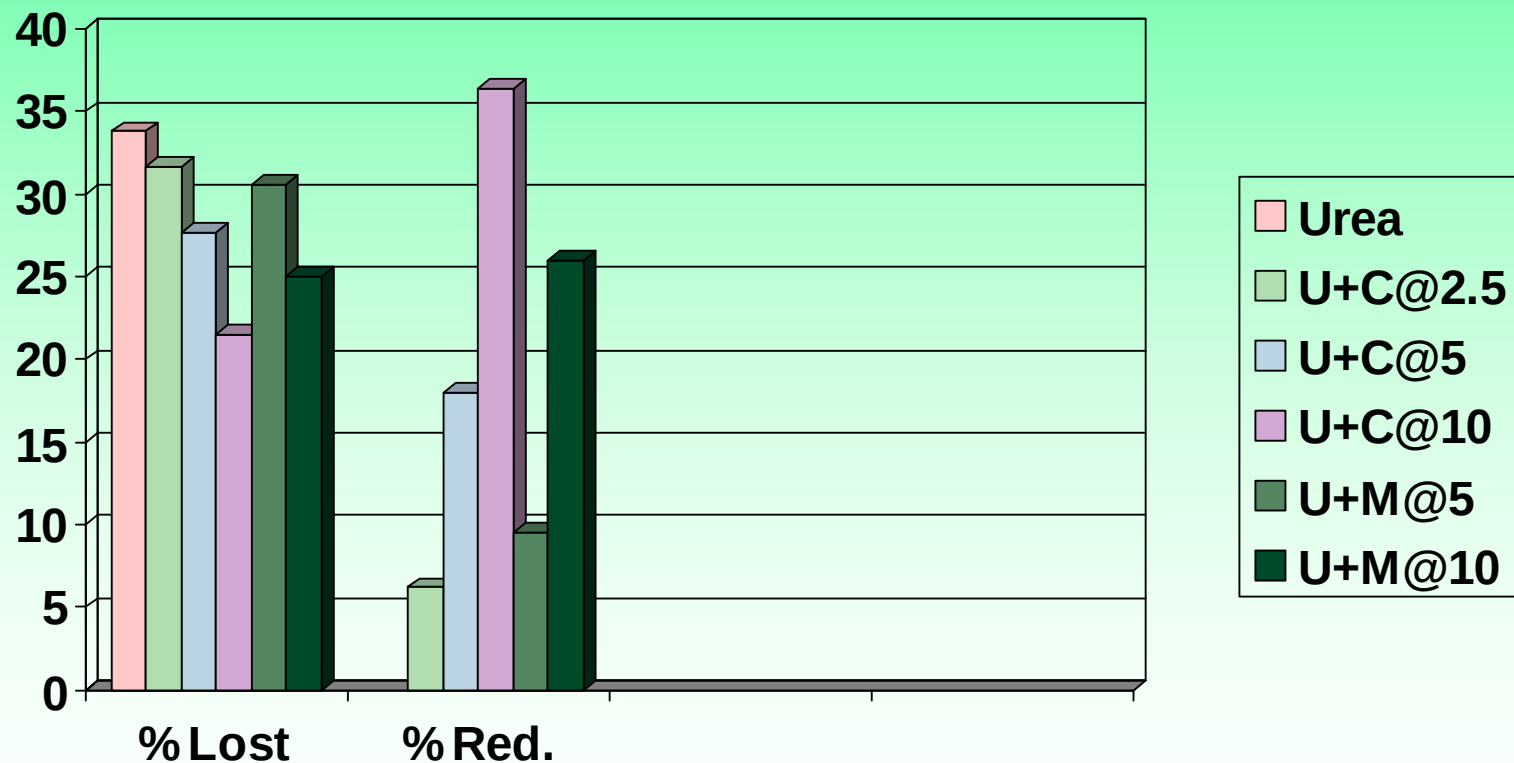


Ammonia Volatilization Losses



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CaTs/UAN Hay Trial

Bluestem-Nueces Co.-Texas

<u>Treatments*</u>	<u>Yield</u>	<u>%Protein</u>
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UAN-31 GPA	1431	4.3
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UAN + CaTs-3.1 GPA	1811	4.8
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***Dribble application-16 inch spacing, 4 acre plots. First rain-0.24 in. 4 DAP.**



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Questions?



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