SFP SPECIALTY FERTILIZER PRODUCTS

Nutrisphere-N for Enhanced Nitrogen Use Efficiency

Fertilizer Outlook and Technology Conference

AVAIL

NUTRISPHERE-N™

Nitrogen – The Problem

Research shows that *50-100%* of your nitrogen can be lost.

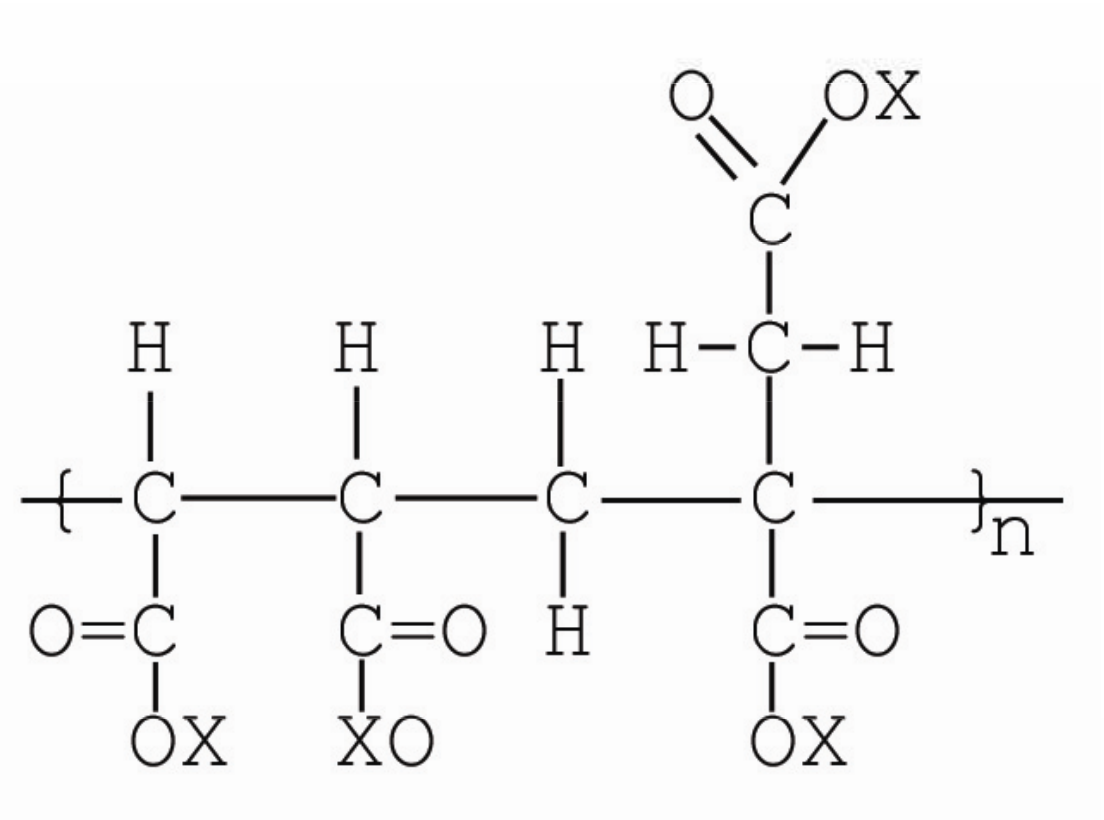
- **Through volatilization**
- **Through nitrate leaching**
- **Through de-nitrification**

- NutriSphere-N helps overcome these causes for nitrogen loss!

Urea Needs Nutrisphere-N

- Urea was the first organic compound synthesized by chemists in the early 1800's.
- It took over 200 years to learn how to control its reactions and loss mechanisms
- NutriSphere-N is the tool to effectively manage those loss mechanisms.

NutriSphere-N Polymer



Nutrisphere-N Polymer

- 30-40 mers
- Molecular weight 3-4000
- Charge capacity 1800 meq./100 g.
- Branched Polymer
- Stable at any pH
- Stable at less than 300° C
- Stable at high ionic concentrations (doesn't like anything to precipitate.)
- Water soluble and slowly biodegradable (10-12 months)

NutriSphere-N Manages…

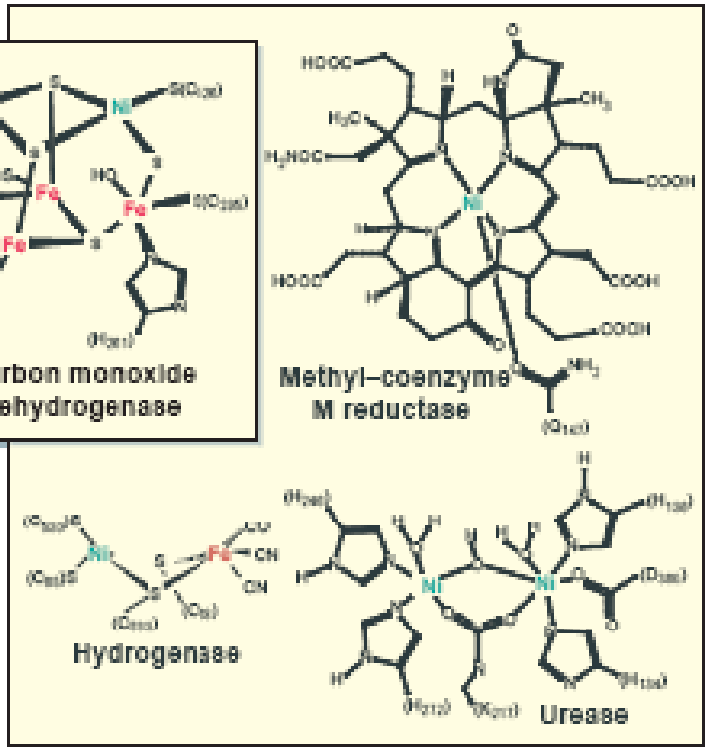
- Volatilization
- Nitrification
- Leaching

NutriSphere-N lasts an entire growing season and effectively manages nitrogen without killing micro-organisms in the soil and without limiting nitrogen availability through a hard shell coating.

Manages Volatilization

- The process by which Nitrogen products are lost into the atmosphere. This leads to the creation of green house gasses.
  - Urease is a di-nickel compound.
  - Each nickel atom has a +5 charge.
  - Nutrisphere-N has a negative charge of 1800 meq/100g.
  - Nutrisphere-N pulls the nickel out of the urease molecule, destabilizing the molecule rendering it ineffective.
- Nutrisphere-N accomplishes this without killing soil micro-organisms.

Urease Volatilization



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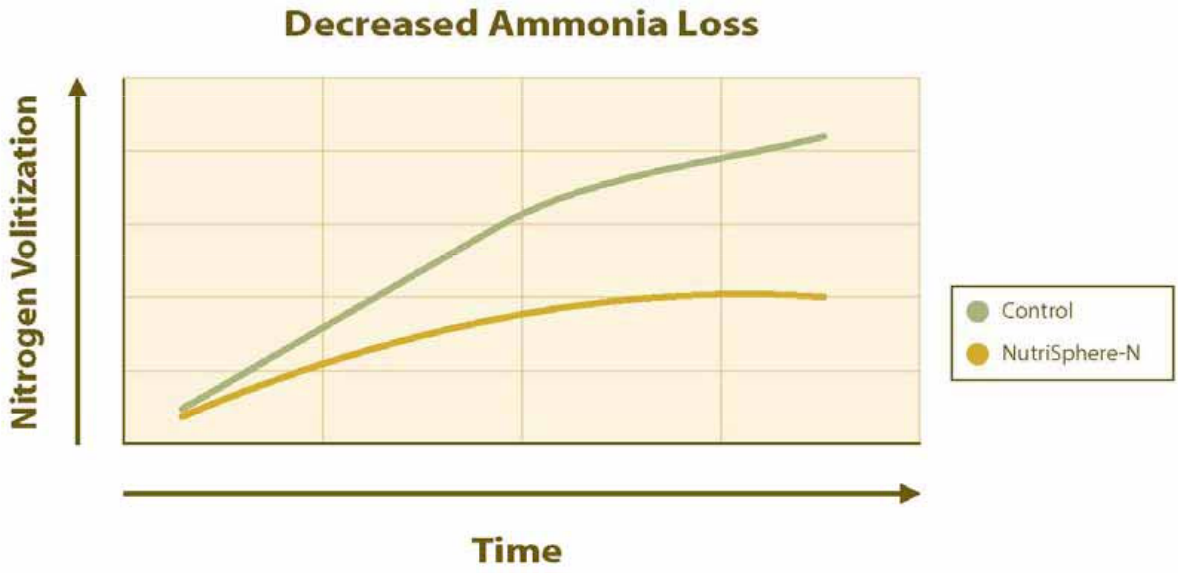
Nutrisphere-N Decreases Ammonia Loss



Effects of NSN on Nitrogen Uptake and Corn Yields.

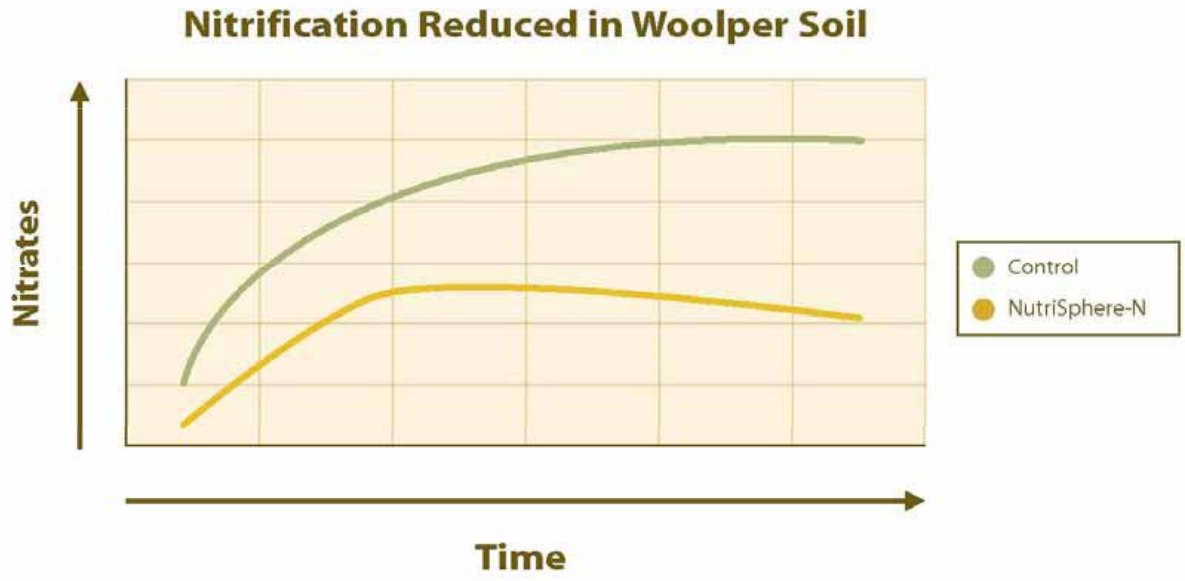
N Rate		Ear Leaf N	Corn Yield
lb/A		%	bu/A
160	Urea + Nutrisphere-N	3.07	216
240	Urea	2.95	192

Soil pH = 7.0 Gordon, Kansas State Univ.

Reduces Nitrification

- Nitrification bacteria's enzymes contain Cu and Fe.
- Nitrosomonas and nitrobacter convert ammonium ions into nitrate ions.
- Nitrate ions when taken up by the crop have to be converted back into ammonium ions before they can be used to make proteins and amino acids.
- This is a huge energy cost to the crop and the resultant effect is lower yields.
- Nitrates also cause lower yields by leaching and denitrification losses.
- The results of this process are decreased nitrogen leaching into lakes and rivers as well as green house gas emissions from denitrification.

Nutrisphere-N: Reduces Nitrification



Manage Nitrification with NutriSphere-N

Treatment lb N/A	Corn Yield bu/A
75 + Nutrisphere-N	124.8
100	128.0

No-till corn UAN b'cast Murdock, U of KY, Princeton 2006

Manages Leaching

- Leaching occurs after ammoniacal nitrogen is converted to nitrates in the soil.
  - Nitrates have a negative charge.
  - Soil has a negative charge.
  - The charges repel each other, leaching occurs.
- By overcoming nitrification, Nutrisphere-N inhibits leaching.

Manages Denitrification

- Loss of nitrate nitrogen under water logged conditions.
- Bacteria utilize O2 from NO3 to survive.
- NO volatilizes into the atmosphere producing a green house gas.

Soil Test Results With NutriSphere-N On Potatoes

Treatment	NO_3	NH_4
300 lb. 46-0-0		
Growers Standard Practice	39	28
GSP + Nutrisphere-N	151	124

Broadcast – Pre-plant

Oregon State Dr. Don Horneck

Soil Test With Nutrisphere-N On Corn

N Fertilizer	Soil NO3	Soil NH4
125 lb N/A	ppm	ppm
Urea	71	20
Urea + NutriSphere-N	74	69

Titonville silt loam
Dunn, Univ. of MO
N applied 5/17; sampled 6/6

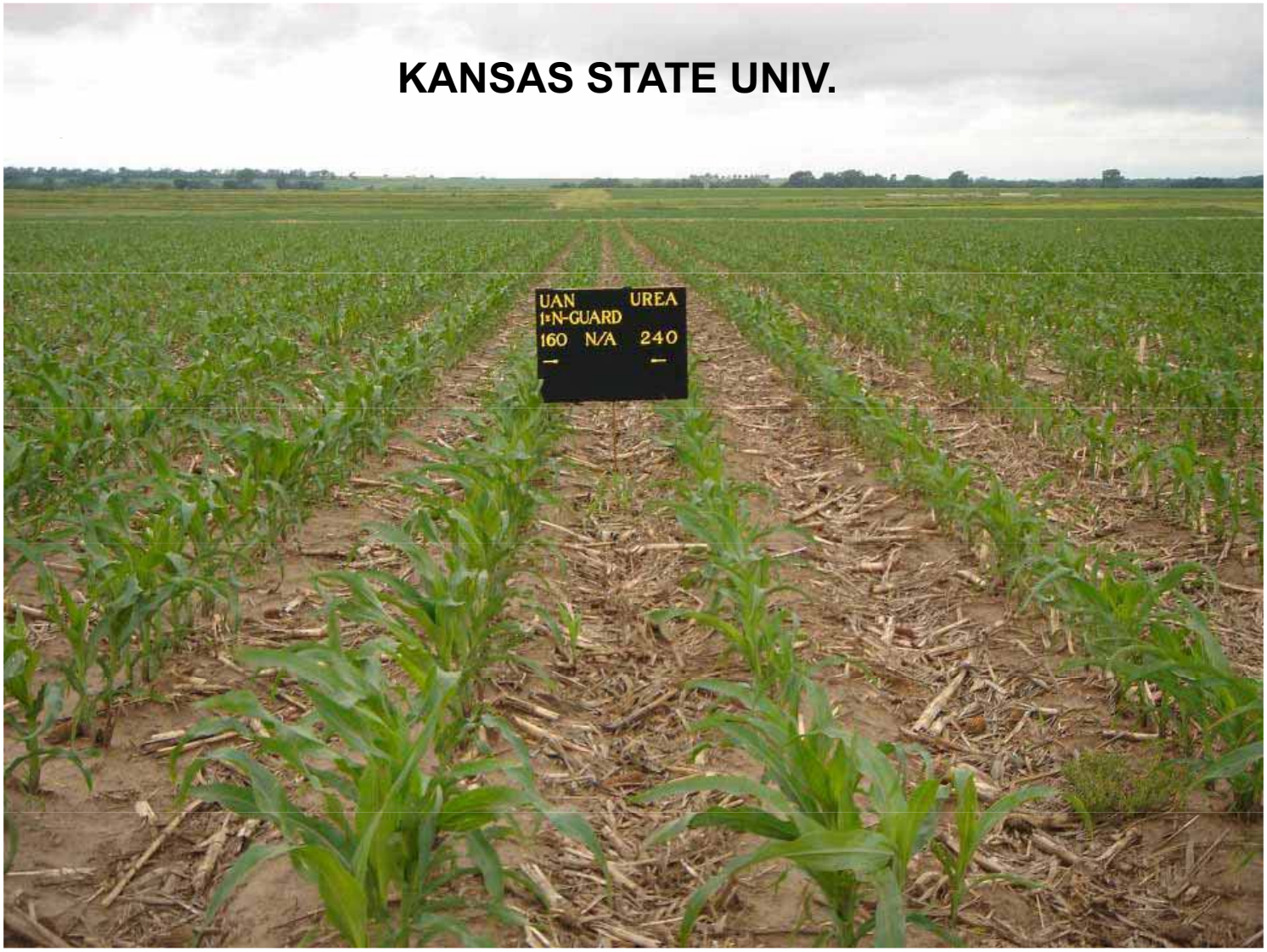
Nutrisphere-N Effects on No-Till Corn

Treatments	**Urea**		**UAN**	
lb/A	*Nutrisphere-N*	*None*	*Nutrisphere-N*	*None*
0	138bu/a	138bu/a	138bu/a	138bu/a
80	166	152	170	157
160	188	169	192	167
240	197	188	196	181

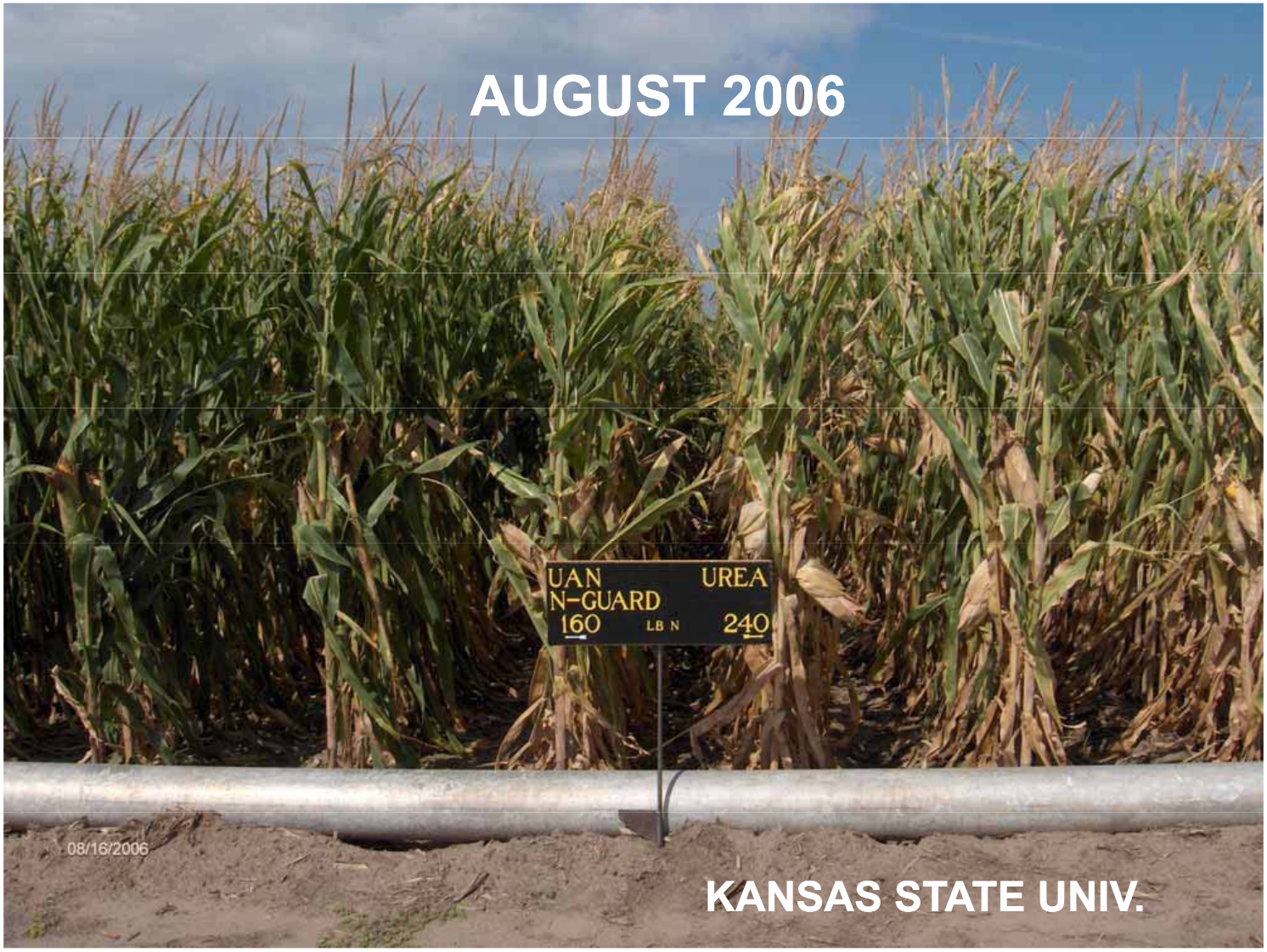
Broadcast; Soil pH 7.0

Gordon, Kansas State University

KANSAS STATE UNIV.



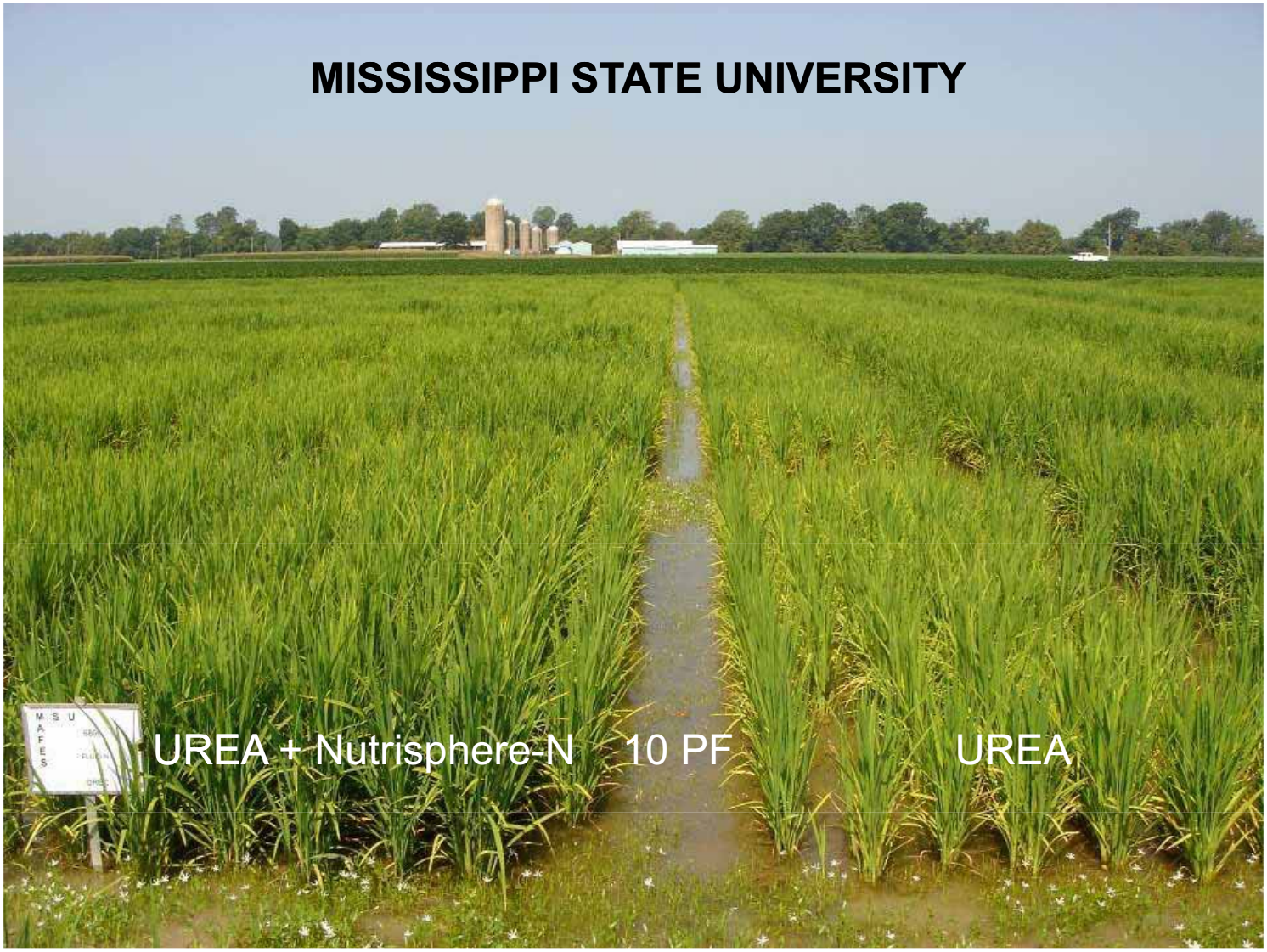

UREA
UAN
N-GUARD
KSU
1%
240
160
N/A
N/A
B-CAST


AUGUST 2006
UAN
N-GUARD
160
LB N
UREA
240
08/16/2006
KANSAS STATE UNIV.

Nutrisphere-N Effects on Urea Performance: No-Till Corn

Treatments lb N/A	Grain Yield bu/A
0	71
90 Banded	104
90 Banded + Nutrisphere-N	131
130 Banded	130
130 Banded + Nutrisphere-N	158

Loam soil Ron Mulford, Univ. of Maryland 2005


MISSISSIPPI STATE UNIVERSITY
UREA + Nutrisphere-N
10 PF
UREA

Onions


NUTRISPHERE-N
HAS BEEN APPLIED TO THIS FIELD
Simplot
Distributed by J.R. Simplot Company
UAN
NutriShere-N

Thank you!

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