Are There Changes In N Management On The Horizon?

George Rehm
507-263-9127
rehmx001@umn.edu

Most Apparent N Shortages--Summer 2011

- corn following corn
- fall applied 82-0-0
- poorly to very poorly drained soils

There Have Been Changes

- weather patterns-- more frequent intense storms
- higher yields thus more residue
- added organic matter enhances immobilization of N applied early
- more efficient use of fertilizer N; 1.25 lb.N/bu then, 0.6 lb.N/bu.
- prediction tools
- risk has become a more serious consideration

Possible Changes In Management Practices

- rate
- time and frequency of application
- use of extenders and additives

The Basal Stalk Nitrate Test

- has been evaluated in many fields
- substantial variability in any field
- affected very much by stress
- has some value if you want to look back
- definitely not a predictive tool

Basal Stalk Nitrate Test--Instinct Use

Treatment	Basal stalk nitrate-N	Yield
	ppm	bu./acre
untreated	1963	149
Instinct Used	2402	152

N Rate and Basal Stalk Nitrate Test

Total N Applied*	Yield	Basal Stalk Values
lb./acre	bu./acre	ppm
221	173	5247
261	182	5801
311	187	8501

*120 lb.N/acre from poultry manure, 6 lb.N/acre from 10-34-0 pop-up, 45 lb.N/acre as 28-0-0 preplant; remainder injected as a sidedress treatment

N Source and Timing -- Corn Yield

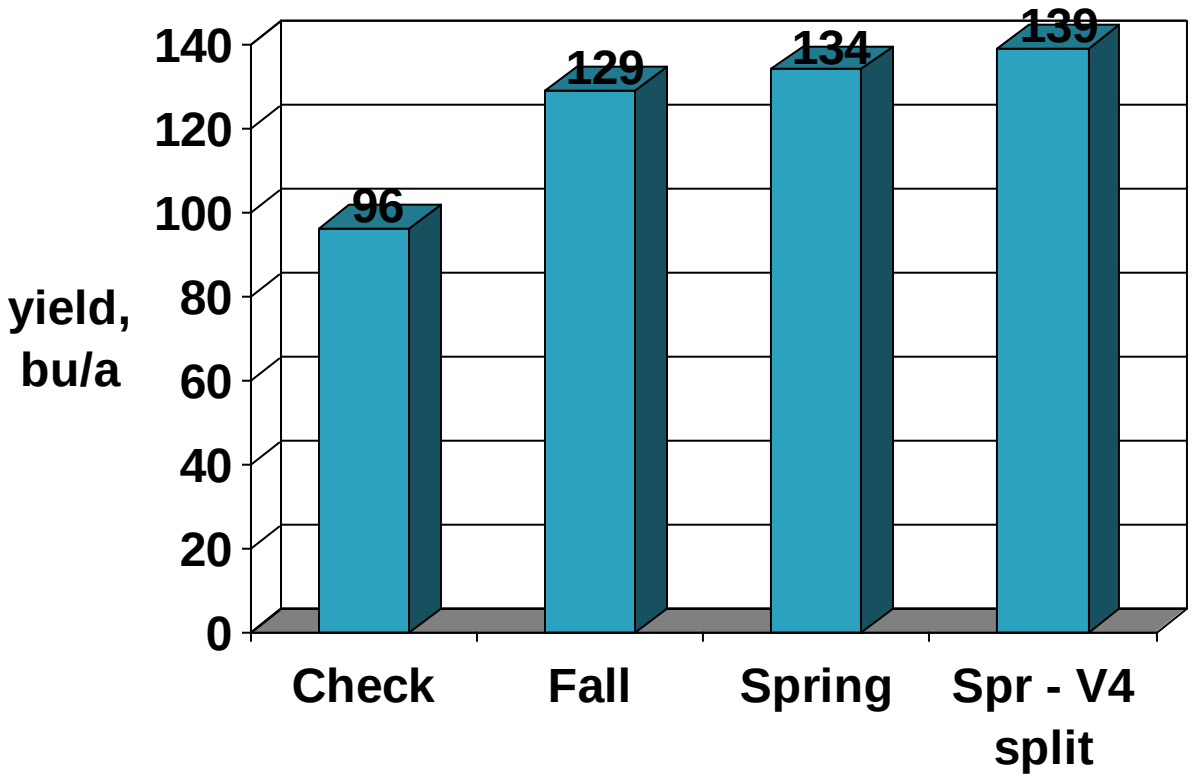
Time of Application	Source	Yield
	bu./acre	
late November	21-0-0-24	168
late fall	46-0-0	157
spring preplant	46-0-0	164
late fall + N-Serve	46-0-0	155
spring + N-Serve	46-0-0	167

Source: Southern Research and Outreach Center

At Waseca

- sidedress N produces no reduction if applied at or before V4
- early (before v4) split application reduces risk

Nitrogen Timing on Corn, SE Farm, 1990 – 2006 (8 yr) Rec. N rate



Considering Sidedress N

- A serious consideration as yields increase
- Agronomics suggest positive benefits for corn
- Period of greatest uptake is 45 to 80 days after planting for corn
- For spring wheat, period of greatest uptake is 30 to 60 days after planting
- Changes in equipment are needed

Split N Applications At 25 Sites

- 1 positive yield increase
- 8 sites where yields were decreased
- 16 no yield increase or decrease from a sidedress application

Concerns With Late Sidedress

- 28-0-0 and 46-0-0 need rain to incorporate
- application date does not match time of maximum N uptake
- rain delays application
- best to inject at least 4 inches

Foliar N for corn

- Big movement in foliar N application
- Promises of greater availability and can use less pounds
- Sounds good in theory
- In practice has not been shown to consistently work
- In most cases where rates can be cut by using foliar the rates were already too high
- Cannot supply all the N needed
- High rates of N can burn tissues

Minot-Roseglen- McKay. Preplant treatme compared to 1 gal/a Coron flag-leaf application after a preplant treatment, 20

Treatment	Yield, bu/a	Protein, %
Check	60	13.8 a
90 U	71.8	14.9 b
90 GP 43	69.8	14.8 b
90 UAN	68.7	14.3 ab
90 GP 30L	71.6	14.7 b
90 U + 1 gal/a CoRon	69.1	15.1 b
LSD 5%	NS	0.6

Potential For Green Sensing

- highly dependent on algorithim developed
- affected by bare soil
- must plan to sidedress some N probably as 28-0-0
- no substitute for measuring soil nitrate N

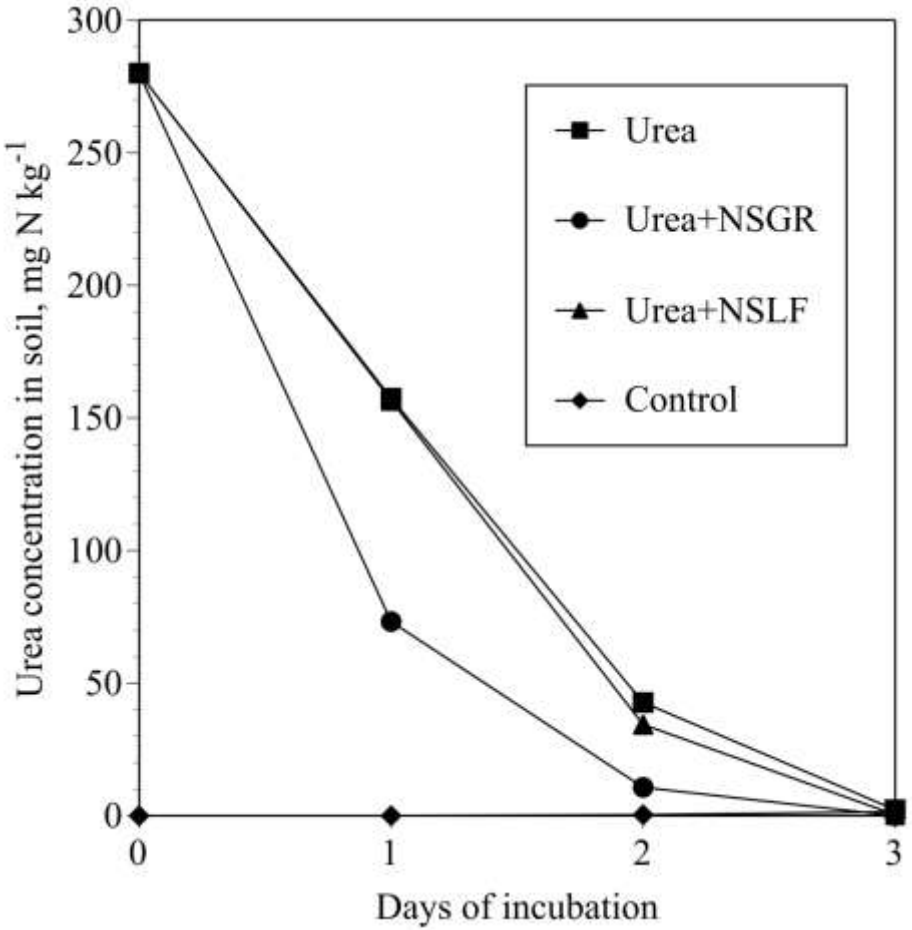
Greenseeker Evaluation

Site	Texture	EONR	Yield	NDVI rate	NDVI split	NDVI
		lb.N/acre	bu./acre	Lb.N/acre	bu./acre	bu./acre
H08	l sand	180	289	90	212	253
CF08	loam	150	222	150	222	205
SW09	l sand	192	223	120	196	227
SE09	silt loam	148	242	120	235	232

What About Extenders and Additives?

- N-Serve and Instinct; they work; Beneficial where high soil moisture is a concern
- ESN; works as advertised--added cost
- Agrotain; works as advertised; buying time
- Nutrisphere N (NSN)--I doubt it

Urea concentration in laboratory study with and without Nutrisphere. Goos, 200



Cumulative Ammonia Loss

	Days After Application			
	3	7	11	15
N Source	% of N Applied			
46-0-0	14.5	35.9	51.8	56.9
21-0-0-24	0.1	0.2	0.5	0.6
46-0-0 + 25% NSN	17.6	42.2	57.8	62.7

Source: Norman and others University of Arkansas

Thank You For Your Attention