

Redneck Security System



Nutrient Mgmt  
Initiative  
Net-Meeting  
Feb. 6, 2007

## Minnesota Nutrient Management Initiative

On Farm Evaluation of  
Nitrogen and Phosphorous  
Nutrient Management

### Minnesota Nutrient Mgmt. Init.

Parts of this presentation stolen from Brian Williams, Minn. Department of Agriculture



### Presentation Objectives

- Define the Initiative
- Review initiative history
- The initiative future- and NRCS involvement
- Review EQIP procedures
- Brief review of site protocols
- Review preliminary results of a few sites.

### What is the Initiative?



### Nutrient Management Initiative

- Farmers working with certified consultants to determine net income differences between two commercial fertilizer application rates.
  - Farmer rates and rates recommended by USDA-NRCS
    - N or P2O5 but not both together
  - Farmers receive a small stipend
  - Helps farmers evaluate their current management program
  - Helps NRCS evaluate current nutrient management guidance and adjust future guidelines

## Nutrient Management Initiative

- Farmers working with Univ. of Minn. to determine net income differences between multiple fertilizer application rates.
  - Four or more N rates
  - Helps farmers refine their management systems.
  - Helps UofM gather information in areas where on-farm demonstrations have been few or non-existent (refine UofM fertilizer recommendations)

## Nutrient Management Initiative

- Four Audiences:
  - Farmers
  - Coop agronomists
  - Univ. of Minnesota
  - NRCS

## Nutrient Management Initiative

- Sponsored by USDA Natural Resources Conservation Service (NRCS) and Rural Advantage
  - Coordinated by Rural Advantage
- Additional Partners
  - Minn. Dept. of Agriculture
  - Univ. of Minn. Extension
  - Univ. of Minn. Southern Research and Outreach Center
  - South Central College-Mankato Campus
  - BNCWQB
  - Others

## Eligible Areas of the State

- South Central Nitrogen Best Management Practice Counties
- Watersheds
  - Blue Earth River
  - Redwood River
  - Root River



## Initiative History

- Following message received about Blue Earth Watershed CSP sign-up: "Houston, we have a problem".
- Early FY 2005. State Conservationist directs staff to develop program for farmers in CSP watersheds to compare their nutrient management techniques to NRCS Nutrient Management (code 590) guidelines.

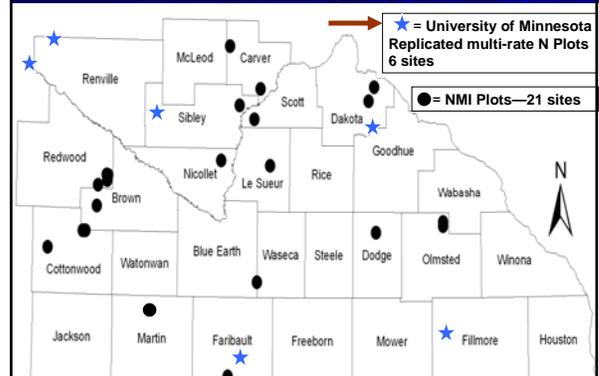
## Initiative History

- Late FY 2005. Contribution Agreement with "Rural Advantage" signed.
  - Administered by Rural Advantage.
    - Minimize NRCS field staff involvement
    - Producer agreements and payments handled by "Rural Advantage"
  - Simplified demonstrations for most producers and a few "optimum economic N rate" demonstrations conducted by the Uof M.

## 2006 Nutrient Management Sites

- 20 producers follow through and provide info
- 18 Nitrogen Sites on Corn
  - 9 corn following corn—168#/A v.s. 202#/A (34)
  - 9 corn following soybeans—122#/A v.s. 160#/A (38)
- 3 Phosphorous Sites on Corn
  - 1 site following corn—2 sites following soybeans
  - NRCS rate—3.6 P205
  - Farmer rate—53 P205

## Crop Year 2006 Nutrient Management Initiative Sites



## Initiative History

- **Late FY 2006.** State Conservationist changes producer reimbursement procedures for crop year 2007 to EQIP FY 06 and 07 FA funding.
  - Increases NRCS field staff involvement
- **Most Crop year 2006 participants** express interest for crop year 07 sites
- **>7 new producers** express interest in project.

## Initiative History

- **Sept. 06-** NRCS State Office develops 35+ FY 06 EQIP contracts for 07 crop year.
  - Final contact number reduced to 32 (covering 19 existing participants and 7 new participants).

## Initiative History

- **Sept. 9, 06** – Affected District Conservationists and Area offices receive guidance from state office (E-mail)
  - Potential participants.
  - Guidance on protracts, HEL determinations etc.;
- **Oct. 13, 06** NRCS State Office e-mails final EQIP 06 contract list, instructions, forms and protocols to affected field offices.

## 07 crop year sites with 06 EQIP Contracts

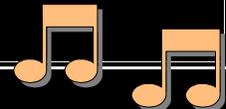
- 7 contracts-Redwood County
- 4 contracts-Cottonwood County
- 3 contracts
  - Brown, Dakota and Martin Counties
- 2 contracts
  - Carver, Faribault and Olmsted Counties
- 1 contract
  - Dodge, LeSueur, Nicollet, Scott, Sibley and Waseca Counties.

## Crop Year 07 Sites with EQIP 06 funding

- 14 Crop Year 07 **soybean** maintenance sites
  - Plots corn in 06 and rotated to soybeans in 07
  - 13 continuation **N** sites
  - 1 continuation **P205** site
- 18 crop year 07 **corn** sites
  - 12 **N** sites-either new site or 2<sup>nd</sup> year corn
  - 6 **P205** sites-either new site or 2<sup>nd</sup> year corn

## Initiative History

- Oct. 06-Jan. 07
  - NRCS state office, hearing little from affected field offices, assumes that offices subscribe to the "Hear no evil; see no evil; speak no evil" philosophy.
  - "Silence is Golden" sung to the tune of whatever song that refrain was in.



## Initiative History

- Oct. 06-Feb. 07
  - Rural Advantage collects additional crop year 06 information and issues payments to 06 participants.
  - NMI team visit with coops and consultants to drum up additional participants for the project.
    - To use EQIP 07 FA

## NMI TEAM AFTER A HARD DAY



## So What Now

- Enlist additional 25 crop year 07 participants to bring total to approx. 50
    - FY 07 EQIP funds to be used.
    - Corn Sites only (N or P205 but not both on same site)
    - Selections made prior to spring field operations
    - Heavy emphasis on Blue Earth River Watershed
    - Interest expressed to NMI team but don't know if NRCS offices have been contacted.
- Work with all project participants having EQIP 06 or 07 EQIP contracts.

## The Sequence

1. NMI Team or NRCS round up new participants for 07 crop year using 07 EQIP FA
2. Protocol, producer agreement and other forms given to potential participants by NRCS
3. Participants return "Agreement" and "Anticipated Nutrient Applications" form ASAP. NRCS forwards to NMI Team.

## The Sequence

4. Participants selected by NMI Team
5. NRCS develops 07 EQIP contracts (These will be for corn sites at the \$1200 rate).
6. Producers with corn plots submit 1<sup>st</sup> required report o/a July 1 to NRCS. NRCS places copy of site location drawing or photo in file and forward report to NMI team for review.

## The Sequence

7. NMI team contacts producer if necessary if problems found.
8. All participants (Soybean and Corn) submit required Dec. 1 report(s) to NRCS who forwards to NMI Team.
9. NMI Team approves; tells NRCS and NRCS develops 1245 and releases payments.
  - \$1200 for corn sites
  - \$\$600 for continuation soybean sites
  - Payments shared with advisor

## QUESTIONS ON SEQUENCE

## Review-NMI Project Team Responsibilities

- Complete Crop Year 06 functions including landowner meetings and data analysis.
- Continue Univ. of Minn. multiple rate sites.
- Enlist new participants and send to NRCS.
- Provide training sessions for crop year 07 participants and advisors
- Review initial 07 participant information gathered by NRCS and help select participants

## Review-NMI Project Team Responsibilities

- Provide on-going support answering questions about Site protocols.
- Review information submitted by participants.
- Recommend release of EQIP funds to NRCS.
- Analyze data submitted by participants through NRCS

## QUESTIONS ON PROJECT TEAM RESPONSIBILITIES

Review  Field Staff Responsibilities for Crop Year 06 Participants with Rural Advantage Agreements

- Forward all questions to NMI Project Team:
  - **Brian Williams:** 651 201 6637  
507 665 6806  
[Brain.C.Williams@state.mn.us](mailto:Brain.C.Williams@state.mn.us)
  - **Linda Meschke:** 507 238 5449  
[linda@ruraladvantage.org](mailto:linda@ruraladvantage.org)
  - **Jeff St. Ores:** 651 602 7869  
[jeff.st.ores@mn.usda.gov](mailto:jeff.st.ores@mn.usda.gov)

Review  Field Staff Responsibilities-07 crop year participants

- Provide protocols; forms and producer agreements to participants if you haven't done so already
  - Should have been done for producers with 06 EQIP contracts
  - Needs to be done for proposed new participants using 07 EQIP FA
- Review agreement with producers but forward detail protocol questions to NMI Project Team

Review  Field Staff Responsibilities-07 participants

- Forward copy of signed agreements and "Anticipated Nutrient applications" form (07 corn sites only) to NMI team ASAP
- Develop 07 EQIP contracts for new participants once NMI team says go.
  - All FY 07 EQIP sites should be corn with a \$1200.00 payment per site.

Review  Field Staff Responsibilities-07 participants

- Forward "Crop Management and Harvest Information Form for Maintenance Plots Going into Soybeans" to NMI team o/a Dec. 1.
- Forward corn "Crop Management Information Form" to NMI team o/a July 1. and corn "Harvest Data Information" form to NMI team o/a Dec. 1
- The bullets above assume producers bring this info to you instead of to the NMI Team.

Review  Field Staff Responsibilities 07 participants

- Complete 1245 after all information has been submitted; reviewed by project team; and approved as acceptable by that team.
- Release Payment
  - Should be \$600.00 for Soybean maintenance sites.
  - Should be \$1200.00 for corn sites.
  - Payments shared with Advisor.

**2007 Maintenance Year on Soybeans** **Producer Agreement**

The Agricultural Producer agrees to maintain crop year 2006 nutrient management on farm s 2007 cropping season. In exchange for payment, the undersigned producer agrees:

- To maintain crop year 2006 nitrogen or phosphorus strips on the 2007 soybean crop as described in the attached project protocol
- To soil sample each individual strip on the demo site as soon as possible and again at the end of the project (hopefully 3-5 years from now). This is a new requirement intended to help determine the impact of different application rates on soil nutrient levels over time. Contact project staff if you have an issue with this new requirement.
- To continue to work with selected Certified Crop Consultant on plot maintenance and yield measurement at harvest.
- To share payment with the selected consultant (amount and payment schedule to be determined by producer and consultant).
- To deliver crop management, harvest and yield information using the attached form to project staff by December 1, 2007.
- To continue to work with the project staff to determine profitability for rates used in the demonstration site.
- To request payment after submittal of harvest and yield information by signing USDA form CCC-1245 at the respective NRCS field office.

In return for the producer's performance, the producer will receive \$600.00

**Agricultural Producer:**  
 Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_  
 Address \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_  
 Plot Location: County \_\_\_\_\_ Township \_\_\_\_\_  
 Section \_\_\_\_\_

Indicate: \_\_\_\_\_ Crop year 2006 Nitrogen Demo Site and/or \_\_\_\_\_ Phosphorus Demo Site  
 Crop Advisor \_\_\_\_\_ Contact Information \_\_\_\_\_

**Should only apply to participants who signed 06 EQIP contracts**

**Should already be appended to 06 EQIP contract**



## QUESTIONS ON NRCS RESPONSIBILITIES

### Developing the 07 EQIP contract

- Demo site EQIP contract is separate from contract developed for regular EQIP.
- Producer can have regular EQIP contract with 590 incentives and separate contract for demo.
  - But not on same acreage and demo acreage does not influence 250 acre cap on 590 incentive
- Producer can have more than one site.
  - One or multiple contracts depending

SYDNEY YOU'RE UP

### Developing the 07 EQIP contract

- Producer must identify a consultant who is a member of a certifying organization to help with the project:
  - Certified Crop Advisor (CCA)
  - Certified Professional Agronomist (CPAg)
  - Certified Professional Crop Consultant (CPCCC)
  - Technical Service Provider (TSP)
  - *Have not made a decision if we will allow a farmer participant who is certified by CCA to "do it without hiring someone else".*

### Developing the 07 EQIP contract

- **Make sure participant is still interested.**
- Check vendor information
- **Check eligibility requirements**
- Check HEL/WC eligibility information
- **Use appropriate narrative in toolkit (one is specific to demo project)**
- Develop contract using the appropriate docket item (one is specific to the demo project)

## QUESTIONS ON EQIP CONTRACTING

## Quick review of site protocol

## Minnesota Nutrient Management Initiative

### 2007 Crop Season Protocol




  
 MINNESOTA DEPARTMENT OF AGRICULTURE  
 FOCUS: THE FARM TO LOCAL MARKET  
 Minnesota Department of Agriculture is an equal opportunity provider and employer.

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 426 Winnebago Avenue, Suite 100  
 Fairmont, Minnesota 56031-3648  
 Telephone 507-238-5449  
 Fax: 507-238-4002

### Nutrient Management Initiative—Design

- **Corn-soybeans or corn-corn rotations**
  - Not sweet corn or silage
- **Either nitrogen or phosphorous site**
- **High and very high testing phosphorus fields**
- **No manure or alfalfa history for past 5 years**
- **Recent soil test required**
  - Sites will be evaluated for soil test changes & yield impacts over time

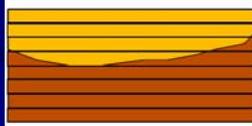
### Nutrient Management Initiative—Design

- **All cropping practices identical except phosphorous or nitrogen application rates**
- **Field uniformity desired**
- **Harvest—1 combine swath per 40'**
- **Weigh wagon—future yield monitor??**

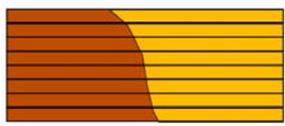
### Nutrient Management Initiative—Design

- **2 Rates replicated 3X = 6 strips**
  - (Plus N plots require 2—0 rate checks)
- **Strip size—minimum of 40' wide by minimum of 600' long**
- **Plot is set up so that soil variability is perpendicular to rows**

Not desired



Desired



### Nutrient Management Initiative Demonstration Plot Set up

Corn on Corn

150#/Acre  
Total N 178.5 #/A

180#/Acre  
Total N 208#/A

0#/A Rate

### Nitrogen Site Design

2 Rates replicated 3 times plus

0 Rate Strip  
100'-200' X 1  
swath width

NRCS Nutrient Guidelines (Treatment A) ←

Normally Applied Application Rate (Treatment B) ←

NRCS Nutrient Guidelines (Treatment A)

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NRCS Nutrient Guidelines (Treatment A)

Normally Applied Application Rate (Treatment B)

0 Rate Strip  
100'-200' X 1  
swath width



**Select NRCS strip (Treatment A) option resulting in 30 pound N rate difference from treatment B**

**Table 1. Option 1—Existing NRCS Nitrogen Guidelines (Treatment A)**

Crop Grown 2006	Organic Matter Level	Realistic Yield (bu./acre)	
		150-174	175-199**
Lbs. N to apply per acre			
soybeans	Low*	150	170
	Medium and high*	120	140
corn	Low*	190	210
	Medium and high*	160	180

\*low = less than 3.0%; \*\* medium and high = 3.0% or more;  
 \*\*\*For purposes of this project—Do Not exceed 199 bushel yield goal rates on NRCS nutrient strips.  
 1. Option 2 rates can be used on NRCS strips when the farmer's proposed normal rates are within 30 pounds of option 1 rates.

**Table 2. Option 2—Proposed NRCS Nitrogen Guidelines (Treatment A)**

The following table is modified from the current U o f M guidance. It is assumed that selected demonstrations sites are highly productive (no inherent yield limiting factors).

Crop Grown 2006	Per lb. Unit of N Cost / Bushel of Corn Value*	Lbs. N to apply per acre
soybeans	<35¢ / ≥ \$2.50	120
	All cost value combinations not shown above or below	110
	35¢ / \$2.00; 40¢ / <\$2.30; 45¢ / <\$2.75	100
corn	<35¢ / ≥ \$2.50	160
	All cost value combinations not shown above or below	150
	35¢ / \$2.00; 40¢ / <\$2.30; 45¢ / <\$2.75	140

## Phosphorous Design

- High STP soils
- 2 rates replicated 3 times
- All management except rates kept constant across Treatment A and B strips
- No check strips

NRCS Nutrient Guidelines (Treatment A)
Normally Applied Application Rate (Treatment B)
NRCS Nutrient Guidelines (Treatment A)
Normally Applied Application Rate (Treatment B)
NRCS Nutrient Guidelines (Treatment A)
Normally Applied Application Rate (Treatment B)

**Table 3. NRCS Phosphorous Application Guidelines for Corn**

Soil test P (ppm)	high		v. high	
	Bray:	Olsen:	Bray:	Olsen:
	16-20	12-15	21+	16+
Expected Yield	Edcst	Band	Edcst	Band
P <sub>2</sub> O <sub>5</sub> /acre to apply (lb/acre)				
< 100	10	10-15	0	10-15
100 – 124	10	10-15	0	10-15
125 – 149	10	10-15	0	10-15
150 – 174	15	10-15	0	10-15
175 – 199	15	10-15	0	10-15
200 +	15	10-15	0	10-15

\*Use one of the following equations if a P<sub>2</sub>O<sub>5</sub> recommendation for a specific soil test value and a specific expected yield is desired.  
 $P_{2}O_{5} \text{ rec} = [0.700 - (.035)(\text{Bray, ppm})](\text{Expected Yield})$   
 $P_{2}O_{5} \text{ rec} = [0.700 - (.044)(\text{Olsen, ppm})](\text{Expected Yield})$   
 Negative values when using the equation indicate no P needed.

**Table 4. NRCS Phosphorous Application Guidelines for Soybeans**

Soil test P (ppm)	Bray P1	Olsen
	16+	12+
Expected Yield	P <sub>2</sub> O <sub>5</sub> /acre to apply (lb/acre)	
30 – 60+	0	

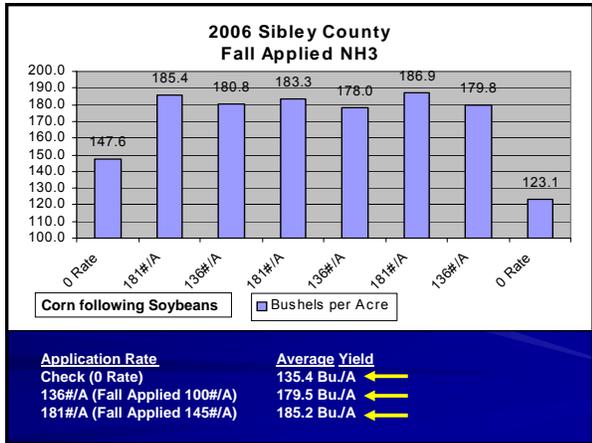
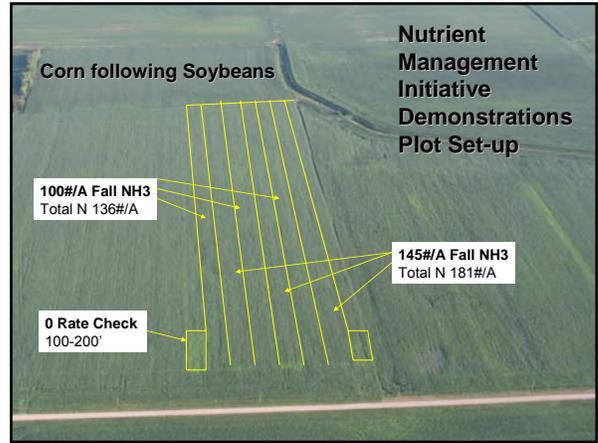
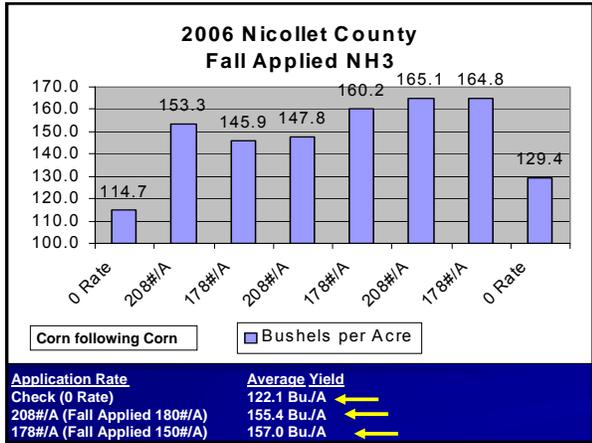
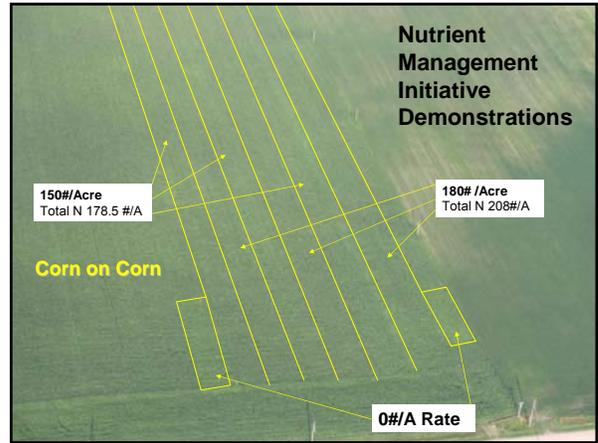
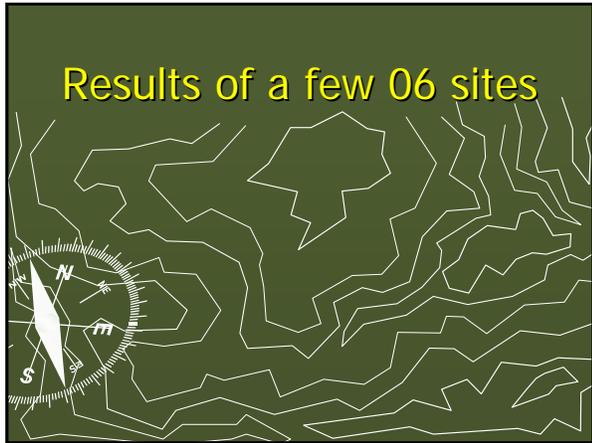
## Protocol for Maintenance Sites on soybeans

- Existing Nitrogen sites:
  - All management constant across treatment except no N on check or NRCS strips
- Existing Phosphorous sites
  - Farmer allowed to follow normal P management on farmer (Treatment B) strips
  - NRCS guidelines = 0
- Strips harvested separately.

## Nutrient Management Initiative Data Review

- Farmers identity kept confidential
- Farm results used as a pool of data
- Farm Business Management will evaluate economics
  - Farmers will receive an economic summary
  - Based on actual N or P costs and base value for corn
- Educational meeting to review outcomes (March 2007)

## PROTOCOL QUESTIONS



#### Dakota County - Marshan Twp. Irrigated ≈ 7"

##### Corn following Corn

Strip Number	Type of Treatment	Strip Length ft.	# of Rows Harvested	Moisture %	Test Weight	Harvest Weight	Lodging Score 1 best 5 worst	Adjusted Yield 15.0% Moisture
	0 Rate (N demo)	155	6	17.4	57	650	2	219.7
1	155	1116	12	17.2	56.5	9880	3	224.9
2	195	1117	6	17.4	57	4905	3	222.6
3	155	1129	6	17.2	57	4810	3	216.5
4	195	1139	6	16.9	56.5	4855	3	217.4
5	155	1140	6	17.4	57	4935	3	219.2
6	195	1159	6	17.6	57	5040	3	219.9
	0 Rate (N demo)	90	6	17.5	57	350	2	196.9

Application Rate: Check (0 Rate), 195#/A (Side Dress 175#/A), 155#/A (Side Dress 135#/A)  
 Average Yield: 208.3 Bu./A, 220.2 Bu./A, 220.0 Bu./A

Dakota County, Marsha Twp.  
Irrigated—Applied 6.5 inches of water—15 ppm

Strip Number	Type of Treatment	Strip Length ft.	# of Rows Harvested	Moisture %	Test Weight	Harvest Weight	Lodging Score 1 best 5 worst	Adjusted Yield 15.5% Moisture
	0 Rate (N demo)	125	6	18.0	57	452	2	182.0
1	191#/A	1115	12	18.0	55.5	9768	2	220.4
2	141#/A	1110	12	17.7	56	9636	2	219.2
3	191#/A	1097	12	18.4	56	9550	2	218.0
4	141#/A	1084	12	18.2	56	9442	2	218.7
5	191#/A	1072	12	18.4	56	9366	2	218.9
6	141#/A	1052	12	18.0	56	9152	2	218.9
	0 Rate (N demo)	125	6	18.5	56	474	2	190.0

Application Rate                      Average Yield  
 Check (0 Rate)                      186.0 Bu./A ←  
 91#/A (Side Dress 175#/A)        219.1 Bu./A ←  
 141#/A (Side Dress 135#/A)      218.9 Bu./A ←

## Summary:

- Nutrient Management Initiative provides a framework empowering farmers and consultants to evaluate agronomic performance
- On-farm demonstrations assist farmers and consultants with fine tuning fertility programs
  - Maintain and/or increase crop yields & profitability
  - Increased fertilizer prices—Can we better manage the last 30#–40# of N applied???
- Evaluate nutrient management & BMP's over a larger geographical area
  - Data generated will assist NRCS with nutrient management guidance



## Nutrient Management Web Site

[www.mda.state.mn.us/nmi](http://www.mda.state.mn.us/nmi)

