

Proceedings of the 4th Annual Nitrogen: Minnesota's Grand Challenge & Compelling Opportunity Conference

4th Annual
NITROGEN:
MINNESOTA'S GRAND
CHALLENGE & COMPELLING
OPPORTUNITY CONFERENCE



Tuesday, February 6, 2018
Minnesota River's Edge Conference Center,
St. Cloud, MN

 UNIVERSITY OF MINNESOTA | EXTENSION

*Thank you to all
of our Supporters!*



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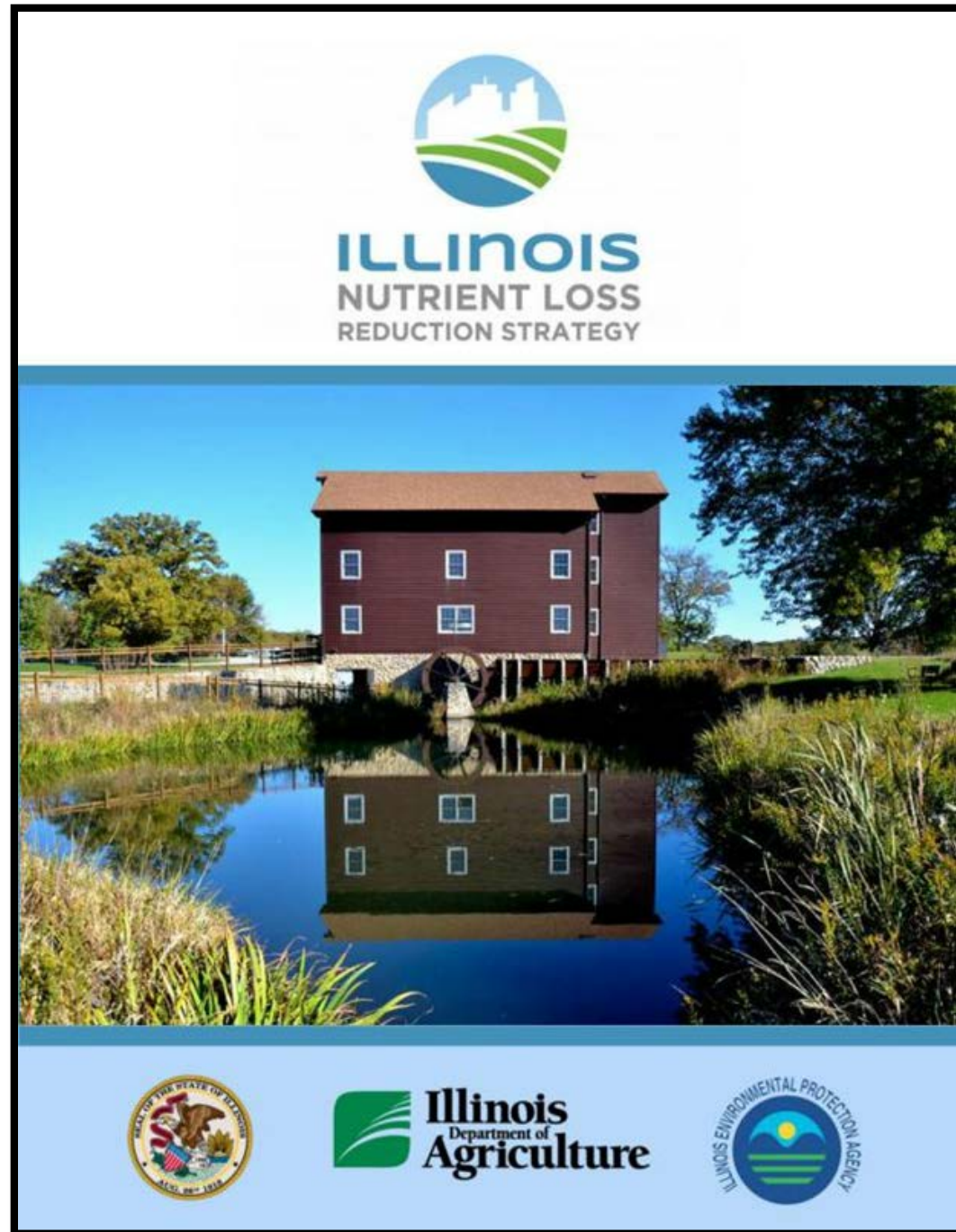
UNIVERSITY GUIDELINES IN TANDEM WITH ON-FARM TESTING TO IMPROVE PROFITABILITY AND WATER QUALITY

Howard Brown

Mgr. of Information Mgt.
and Nutrient Stewardship

WATER QUALITY TARGETS

- 15% Reduction in loading of $\text{NO}_3\text{-N}$ by 2025
- 25% Reduction in loading of P by 2025



We will be viewed as a source of the problem or part of the solution.

Voluntary Practices

Outreach

Education

PROGRESS

Regulation

Litigation

LITTLE CHANGE



VIEWED AS PART OF THE SOLUTION

- **M**inimize Environmental Impact
- **O**ptimize Harvest Yield
- **M**aximize Input Utilization

**It's All About
M.O.M.**



UNIVERSITY GUIDELINES

4Rs of Nutrient Stewardship

.....

RIGHT SOURCE

RIGHT RATE

RIGHT TIME

RIGHT PLACE

.....



Mosaic

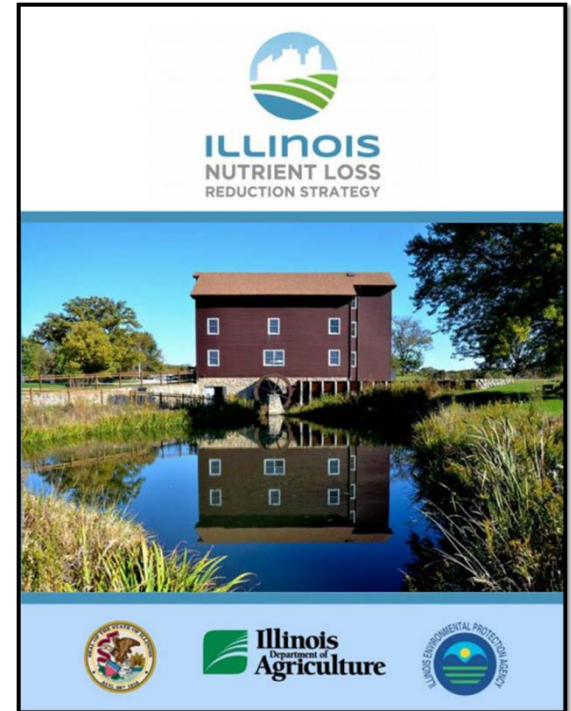


**CERTIFIED
CROP ADVISER**

SUPPORT AVAILABLE



Minimize Environmental Impact
Optimize Harvest Yield
Maximize Input Utilization





CORN NITROGEN --- **RATE CALCULATOR**

Finding the Maximum Return To N and Most Profitable N Rate
A Regional (Corn Belt) Approach to Nitrogen Rate Guidelines

This site provides a process to calculate economic return to N application with different nitrogen and corn prices and N rates directly from recent N rate research data. The method used follows a regional approach for determining guidelines that is implemented in several Corn Belt states.

START HERE

Choose how you want to calculate N rates, using one set of prices or using multiple prices.



the Bulletin

pest management and crop development

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[!\[\]\(339a16584d5da0f0a3ca4e9ec17bf6a1_img.jpg\) ShareThis](#)

- Use N-Rate Calculator
- **November 1st (50° F 4-inch)**
- Use N-Serve

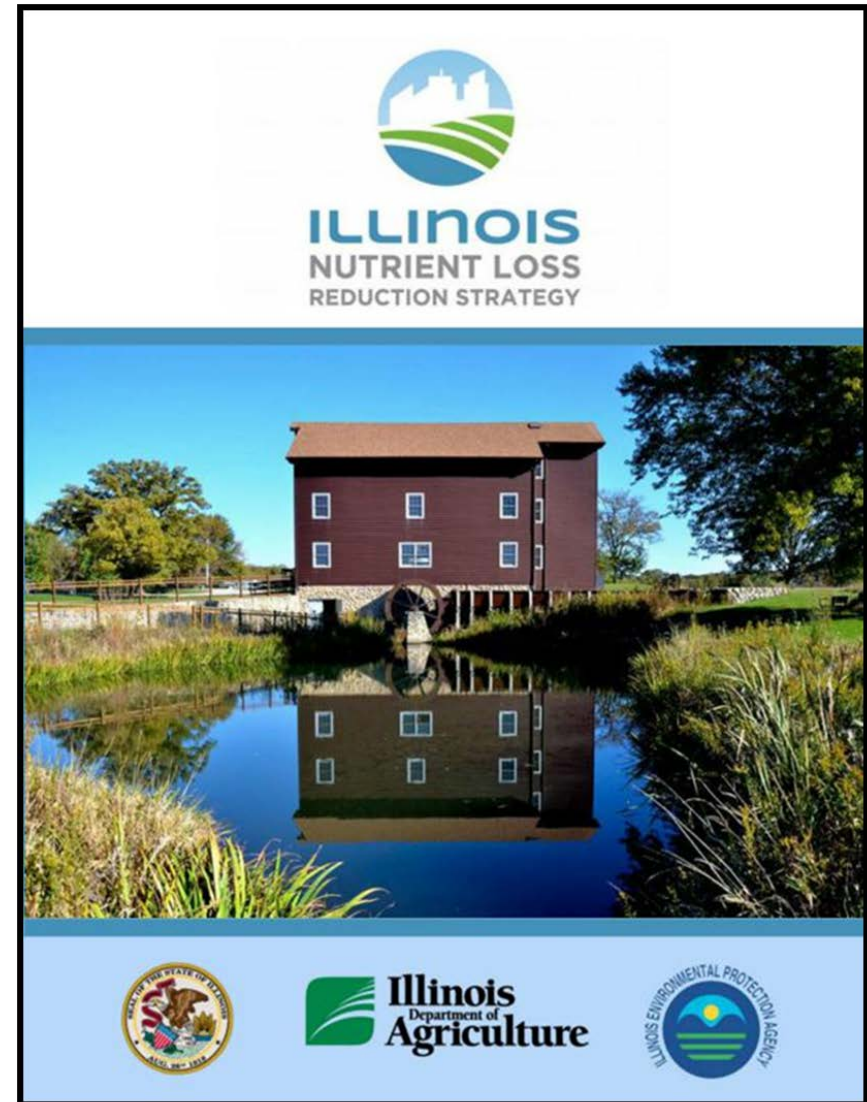
Timing Fall Nitrogen

Posted on October 19, 2017 by [Emerson Nafziger](#)

The substantial rain that fell over central and northern Illinois between October 15 and 17 has rehydrated the soil that was dried out by crop water use, and harvest has moved back to the field. As a result, thoughts turn to application of fall ammonia in central and northern Illinois. Waiting until soil temperatures are at or below 50 degrees before applying ammonia (with a nitrification inhibitor) lowers the rate of nitrification, so helps preserve N in the soil as ammonium is safe from loss.

REDUCTION TOOLS

- Use MRTN
- Use N-Serve w/Fall N
- Split-Apply N
- Spring N on tiled fields
- Cover crop use



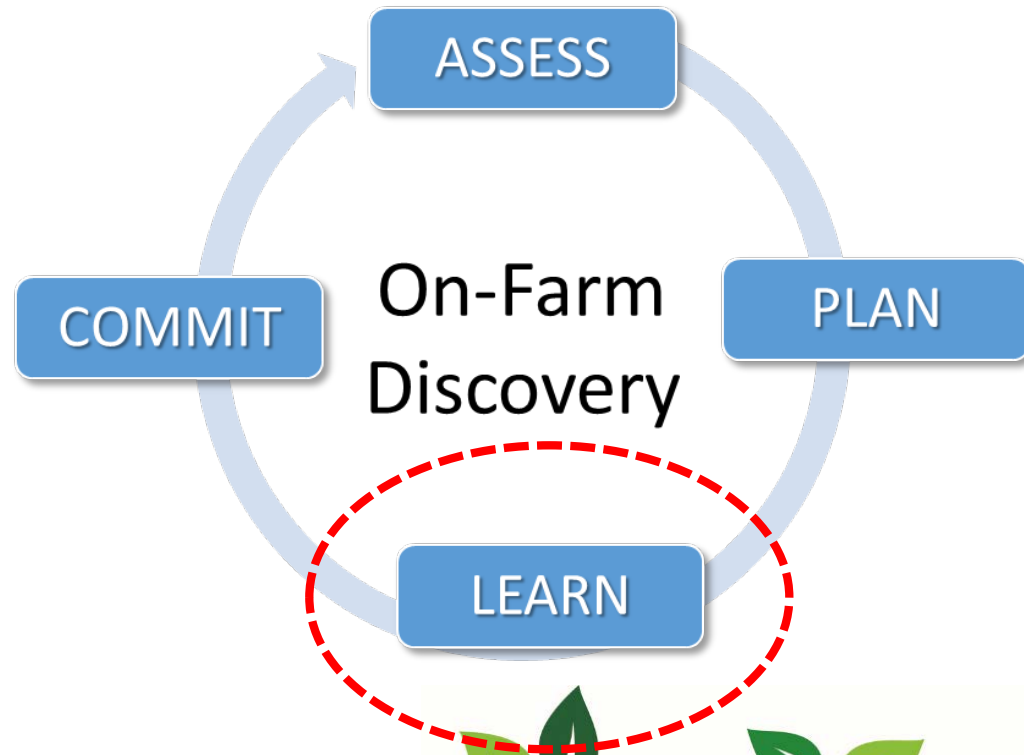
ON-FARM DISCOVERY

Farmer questions – Farmer fields – Farmer data

“Discovery is seeing what everyone else has seen and thinking what nobody has thought.”

STEWARDSHIP APPROACH (Important)

- ASSESS
- PLAN
- LEARN
- COMMIT



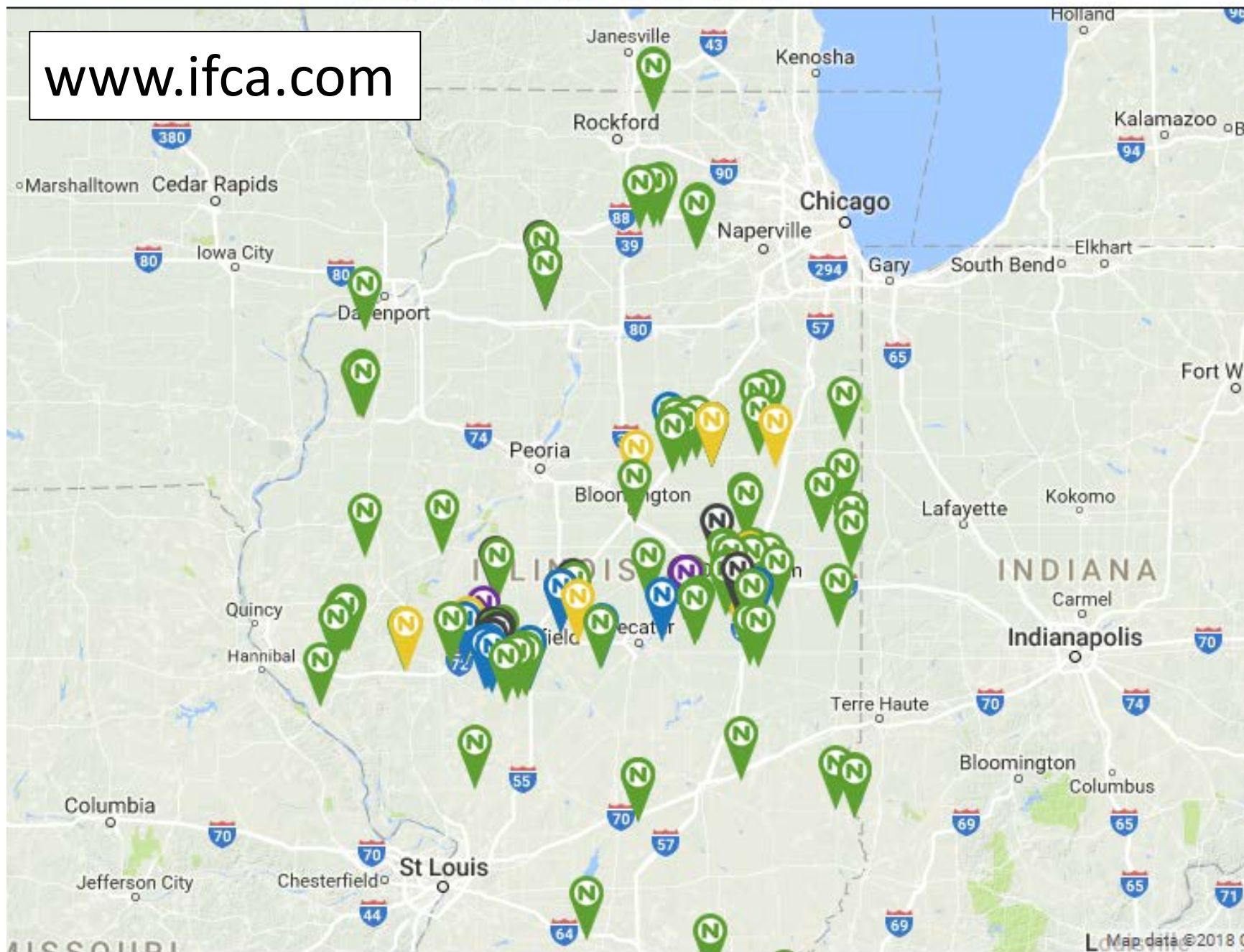
MOM **Minimize
Optimize
Maximize**

IMPROVE STRATEGY WITH ON-FARM DISCOVERY

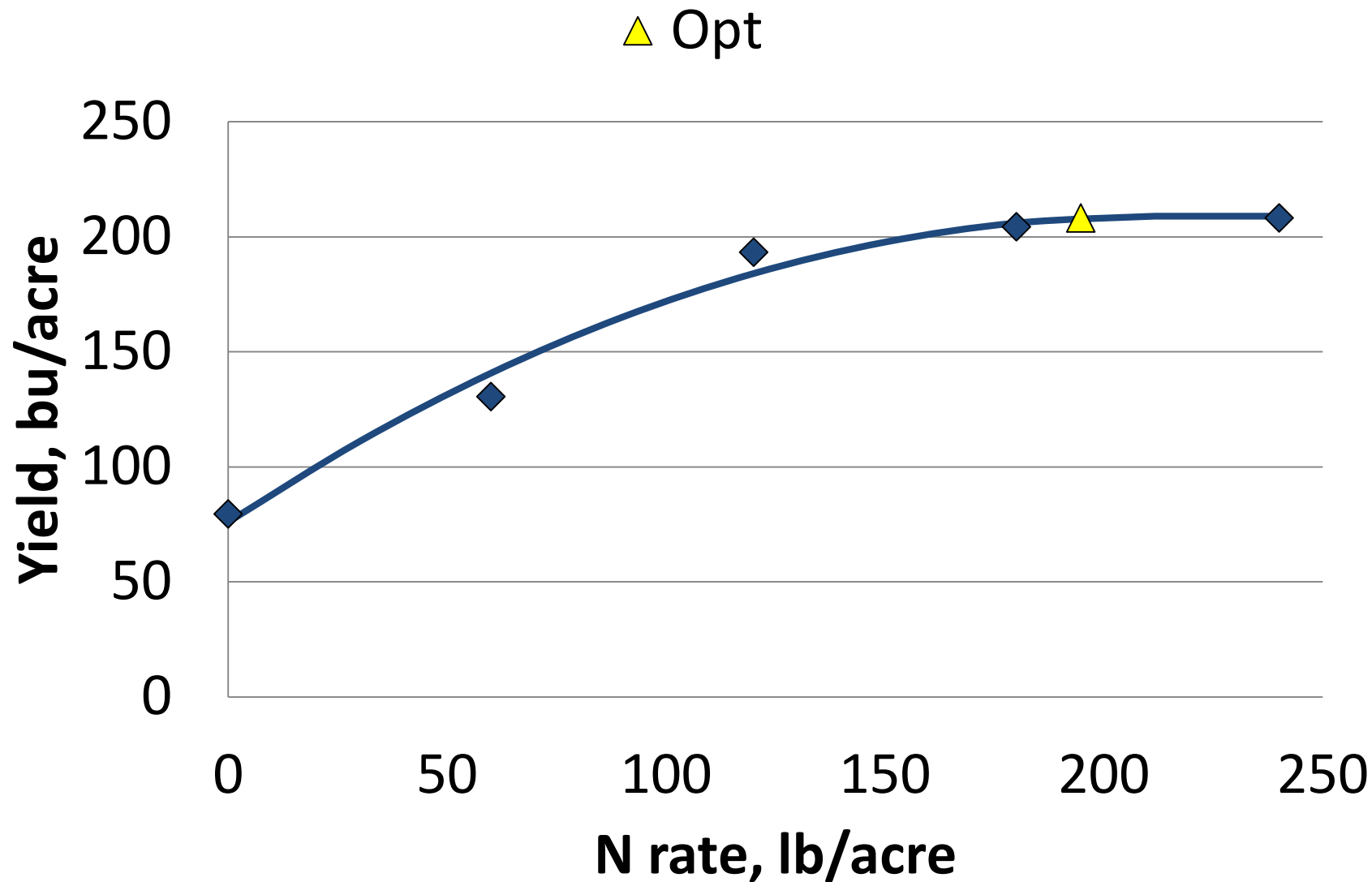
- N-Rate Study
- N-Rate x Timing Study
- Slowing Down Nitrification with N-Serve
- System vs. Application

Keep It 4R Crop N-Rate Trials

www.ifca.com



UI Champaign Co. S-C 2015



Frequency of Economic Optimum N Rate

178 Sites – Central IL

MRTN = 177 lbs N/acre

% of Sites

0 - 25

25 - 50

50 - 75

75 - 100

100 - 125

125 - 150

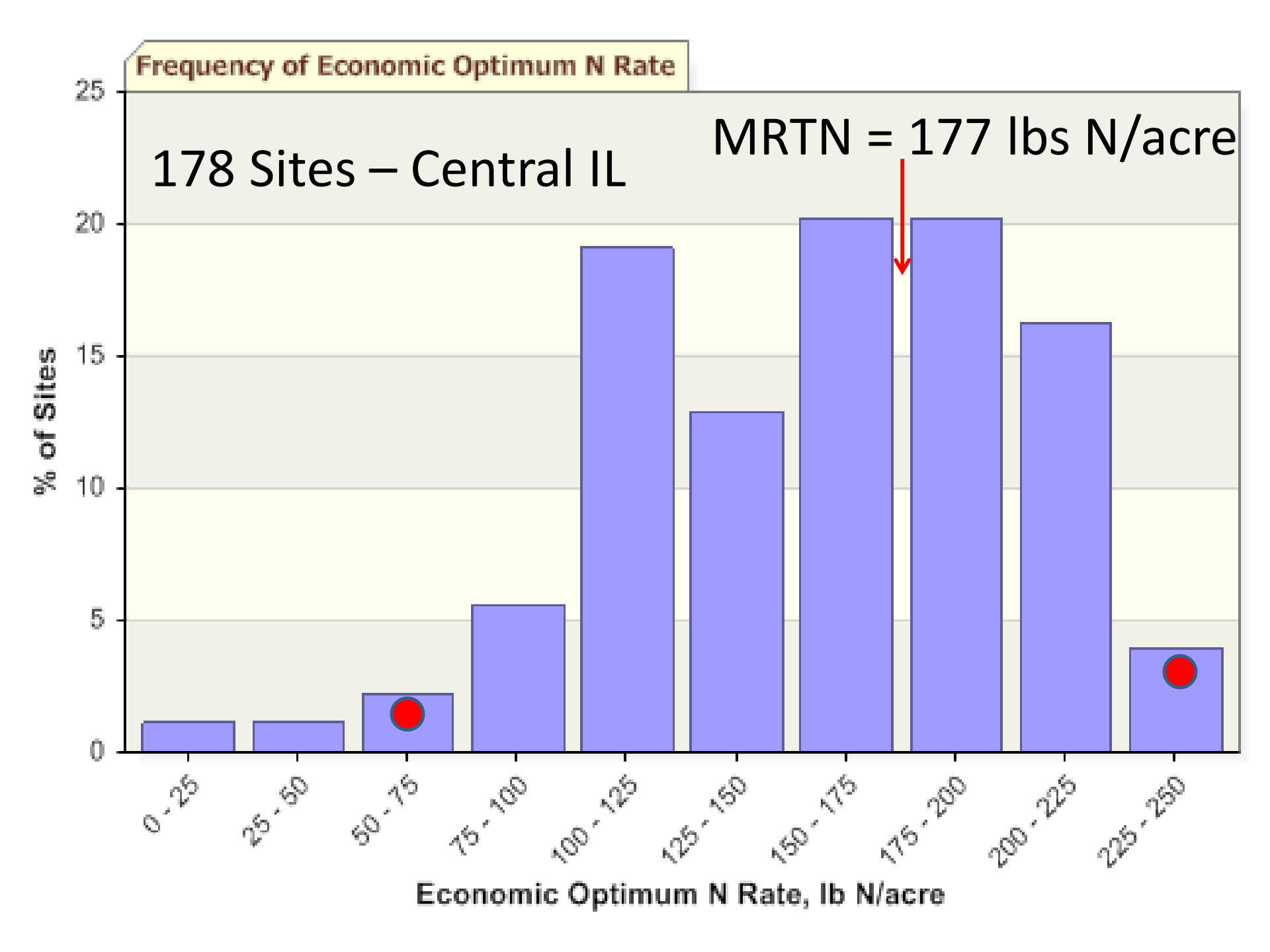
150 - 175

175 - 200

200 - 225

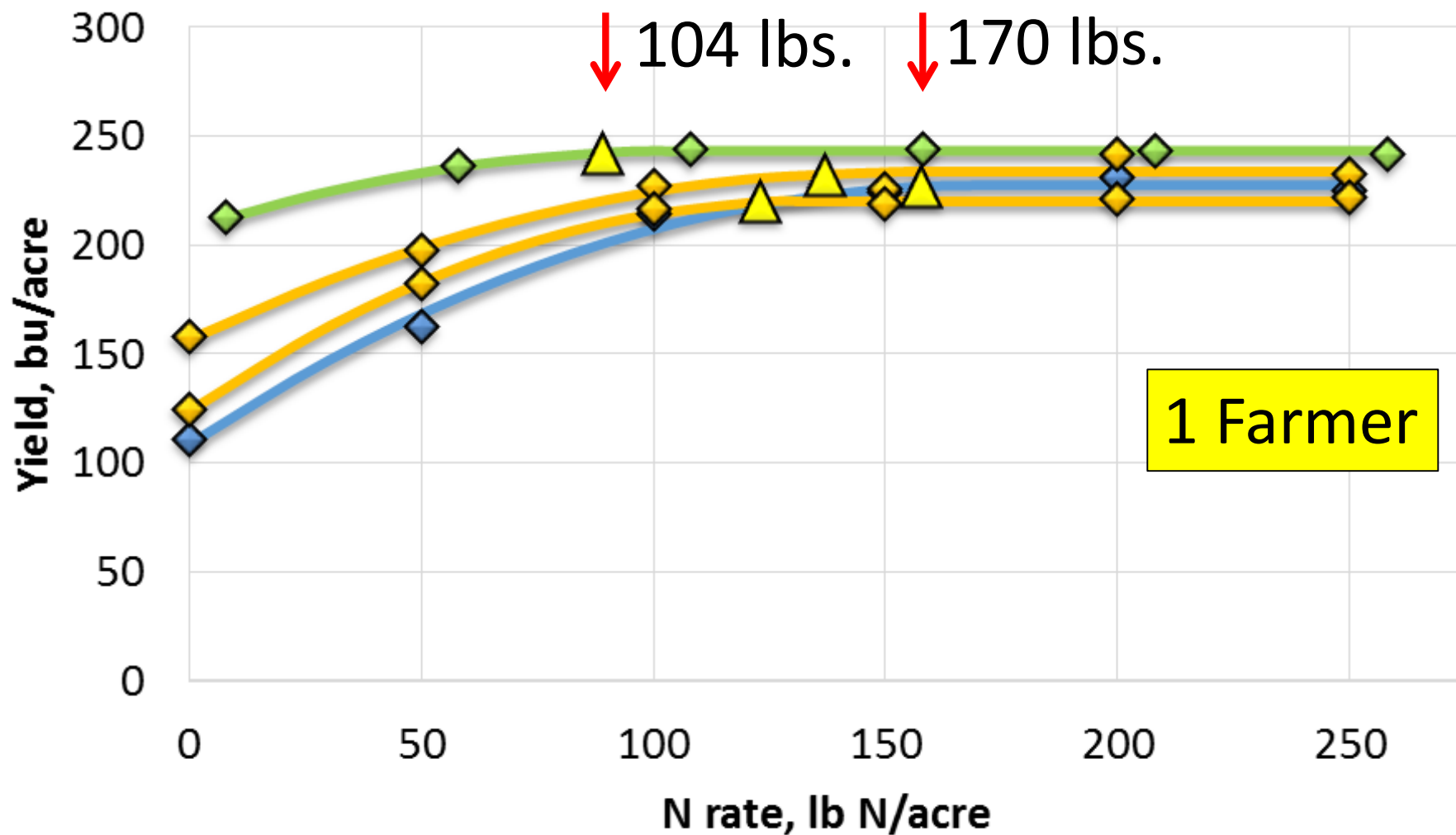
225 - 250

Economic Optimum N Rate, lb N/acre



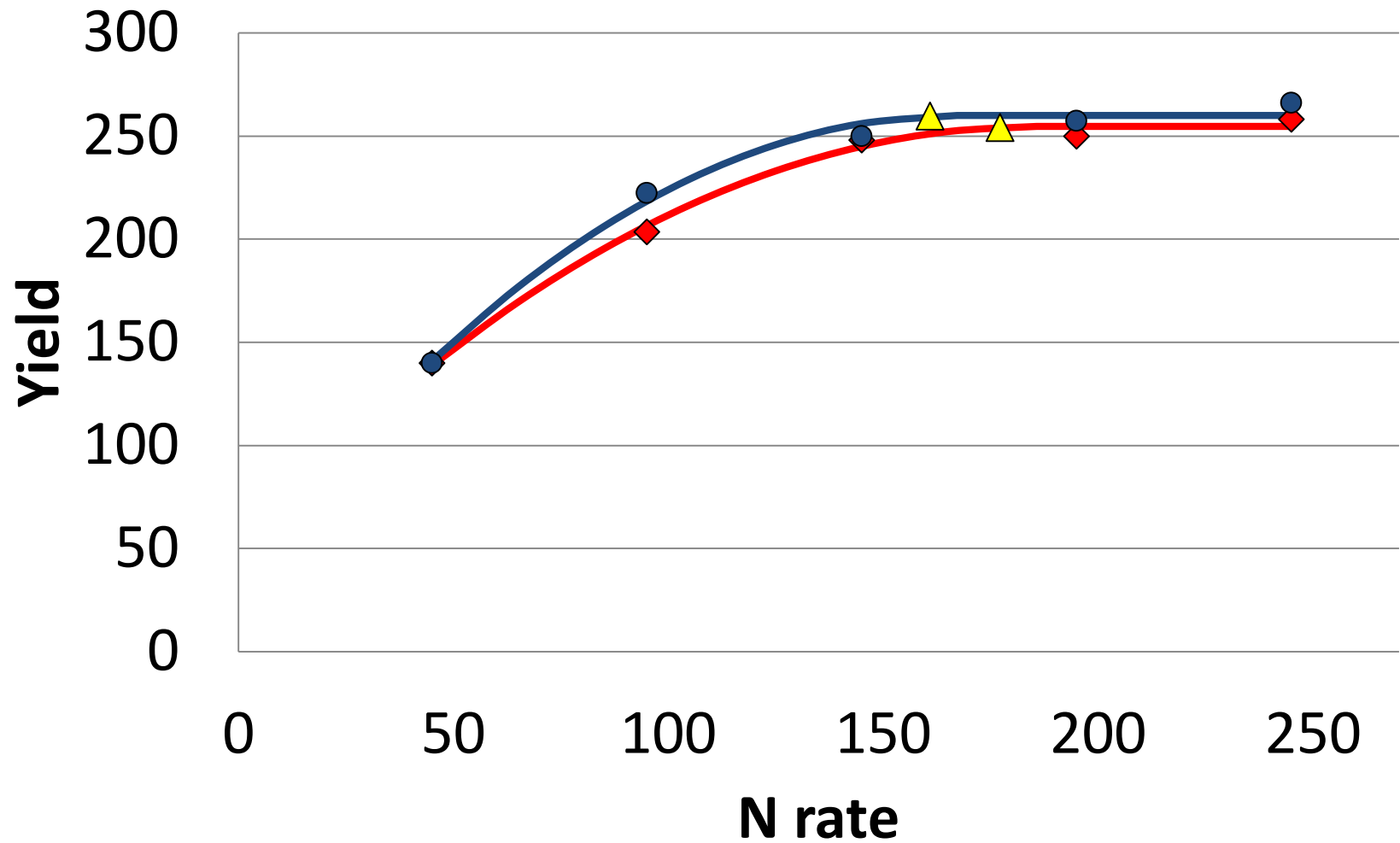
Champaign County, Soy-Corn, 2014-2017

◆ 2014 ◆ 2015 ◆ 2016 ◆ 2017 ▲ Optimum



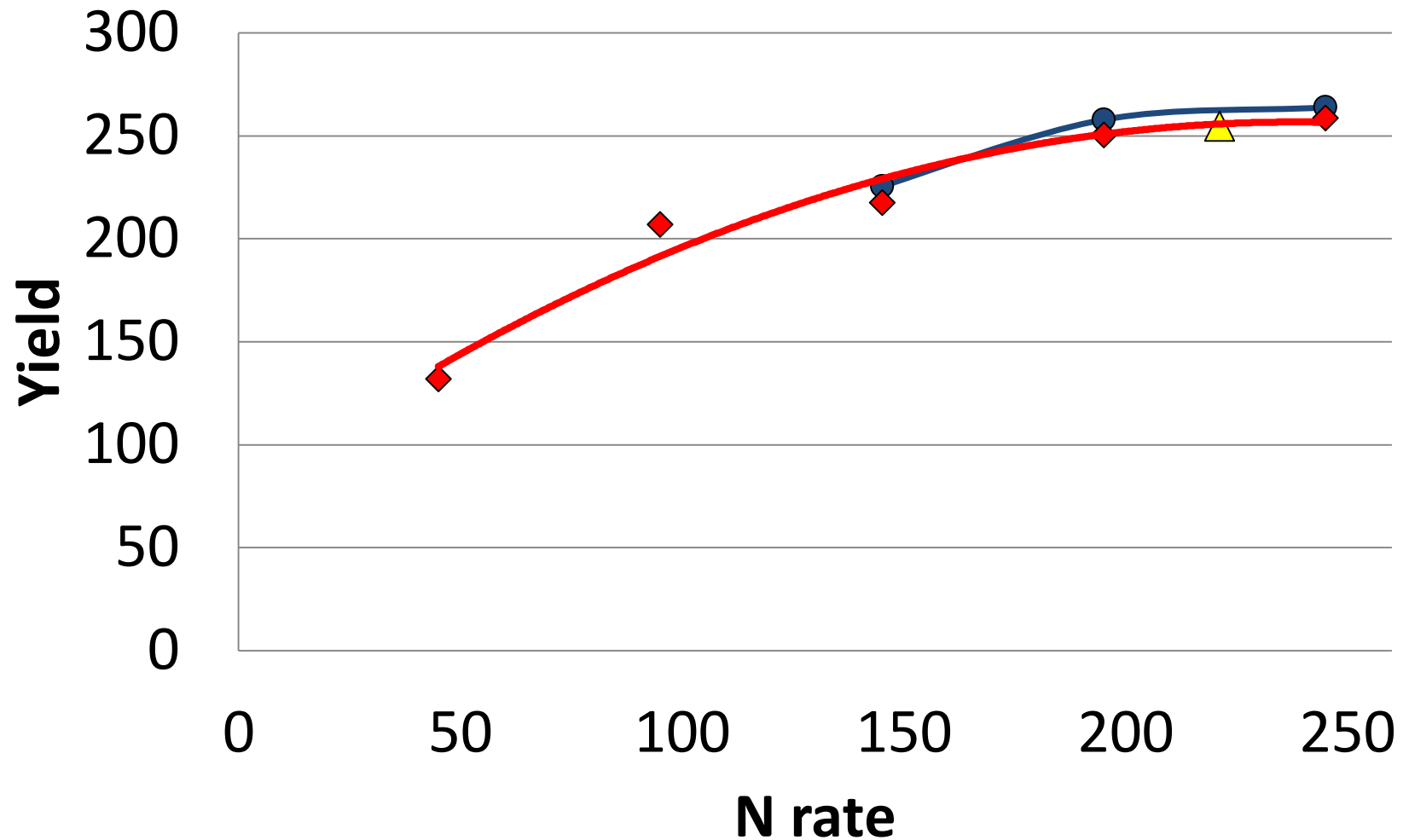
Piatt Co. S-C 2015

◆ Fall ● Spring ▲ Optimum



Piatt Co. S-C 2015

◆ Fall ● Fall+SD 50 ▲ Optimum



PURPOSE

2500 sites since 2010
Created by Illini FS

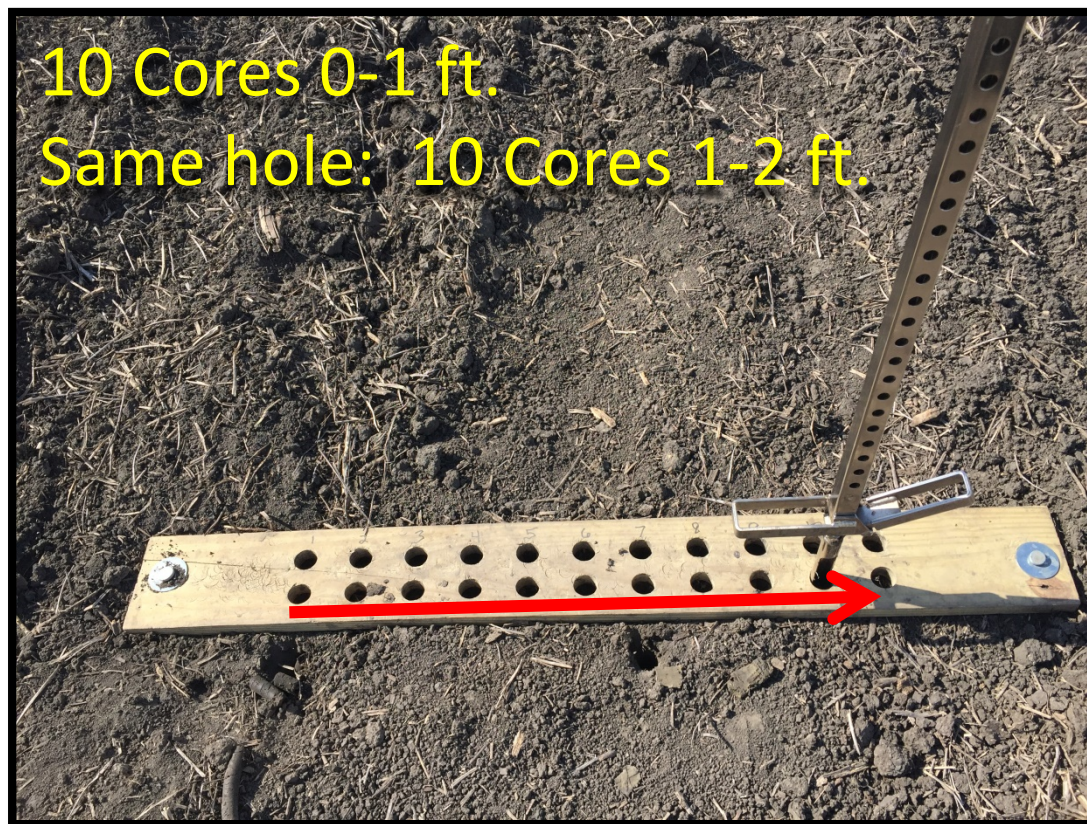
- Inventory
- Track
- Verify
- Apply

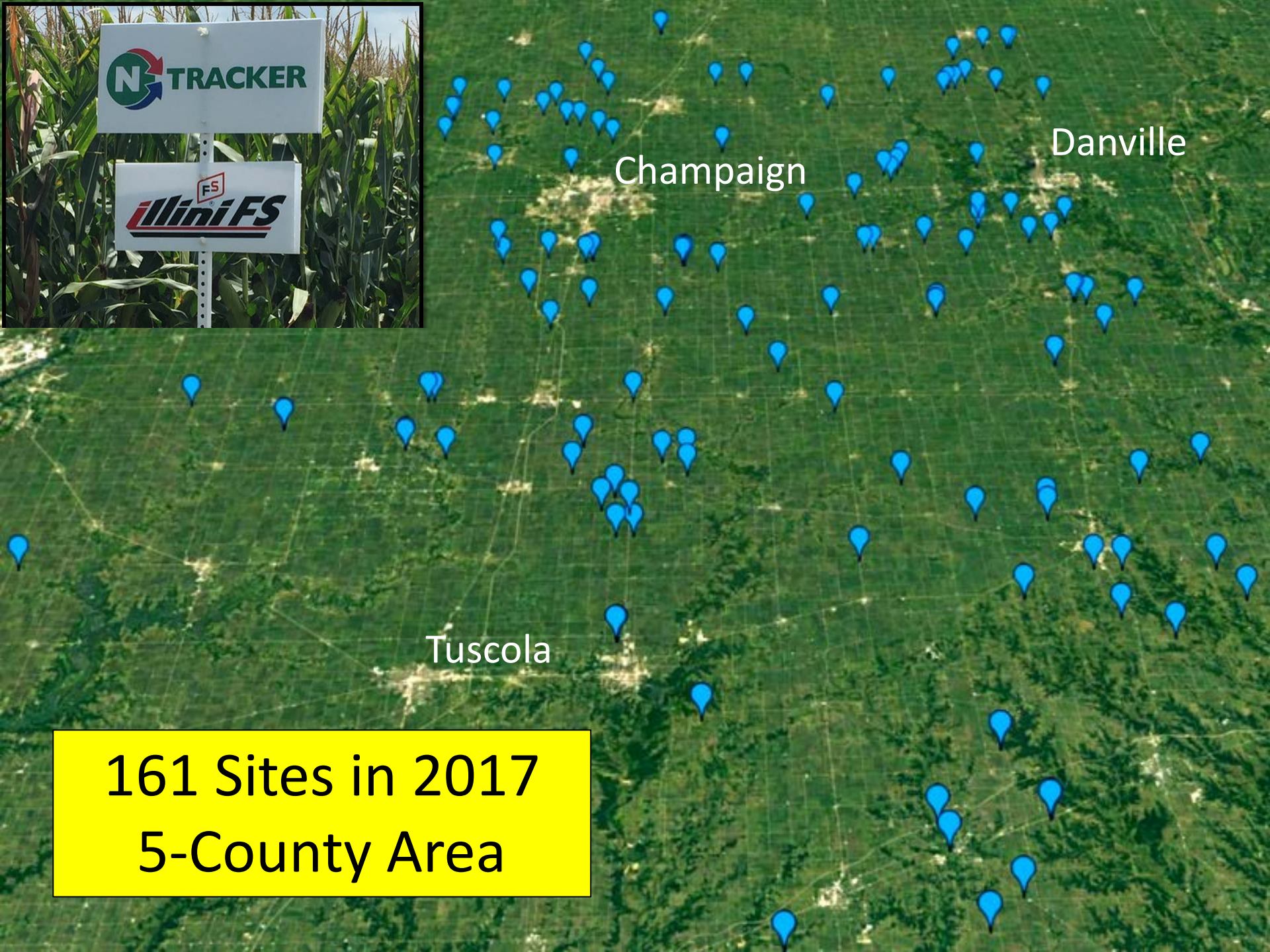


N Management System

New N Management Tool

USE A TEMPLATE FOR N- INJECTED APPLICATIONS.





Champaign

Danville

Tuscola

161 Sites in 2017
5-County Area

www.nu-tracker.com

[HOME](#)

[ABOUT THE PROGRAM](#)

[PROJECTS](#)

[STEWARDSHIP BLOG](#)

[LEARNING](#)

[YOUR FEEDBACK](#)

Teach a student to learn.
Inspire a student to lead.

"It's not about nutrient reduction,
it's about nutrient utilization."

[HIGH SCHOOL PROJECTS](#)



COUNTDOWN FOR 2017-18 PROJECT

Efforts are currently underway to put the finishing touches on the 2017-18 Nutrient Stewardship Program. This year the program will focus on ways to help farmers make better N rate and time of



NEW TEST RESULTS

Updated 5/19/2017

Click on the above icon to
see our most recent testing

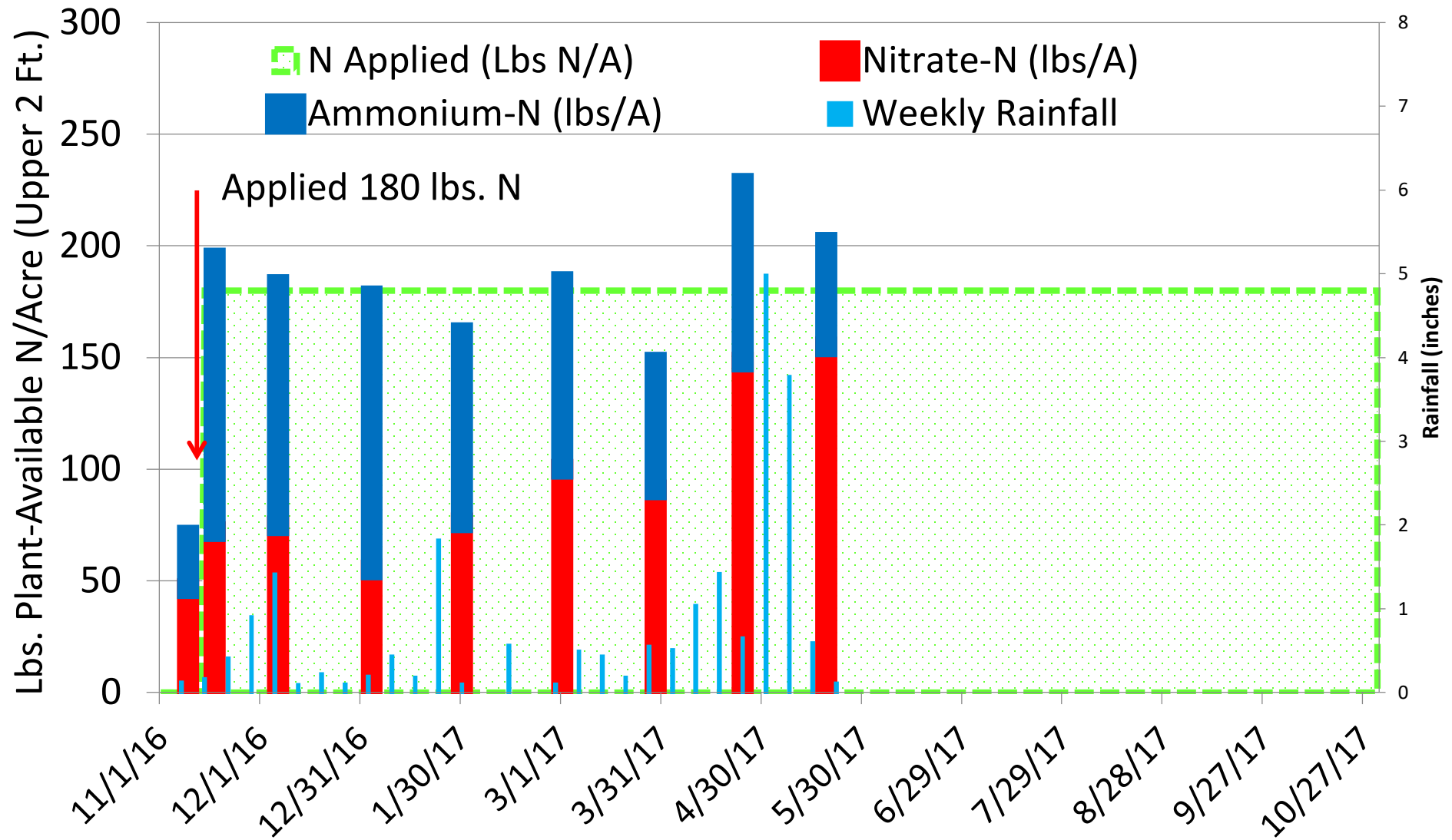
PARIS HS TREATMENTS

- **3 Reps.**
 - **RCB**
- 1 100% N Applied Fall, 2016
 - 2 100% N Applied Spring, 2017
 - 3 50% N Applied Fall, 2016
50% N Applied Spring, 2017
 - 4 50% N Applied Spring, 2017
50% N Applied Post-emerge, 2017
 - 5 50% N Applied Fall, 2016
25% N Applied Spring, 2017
25% N Applied Post-emerge, 2017

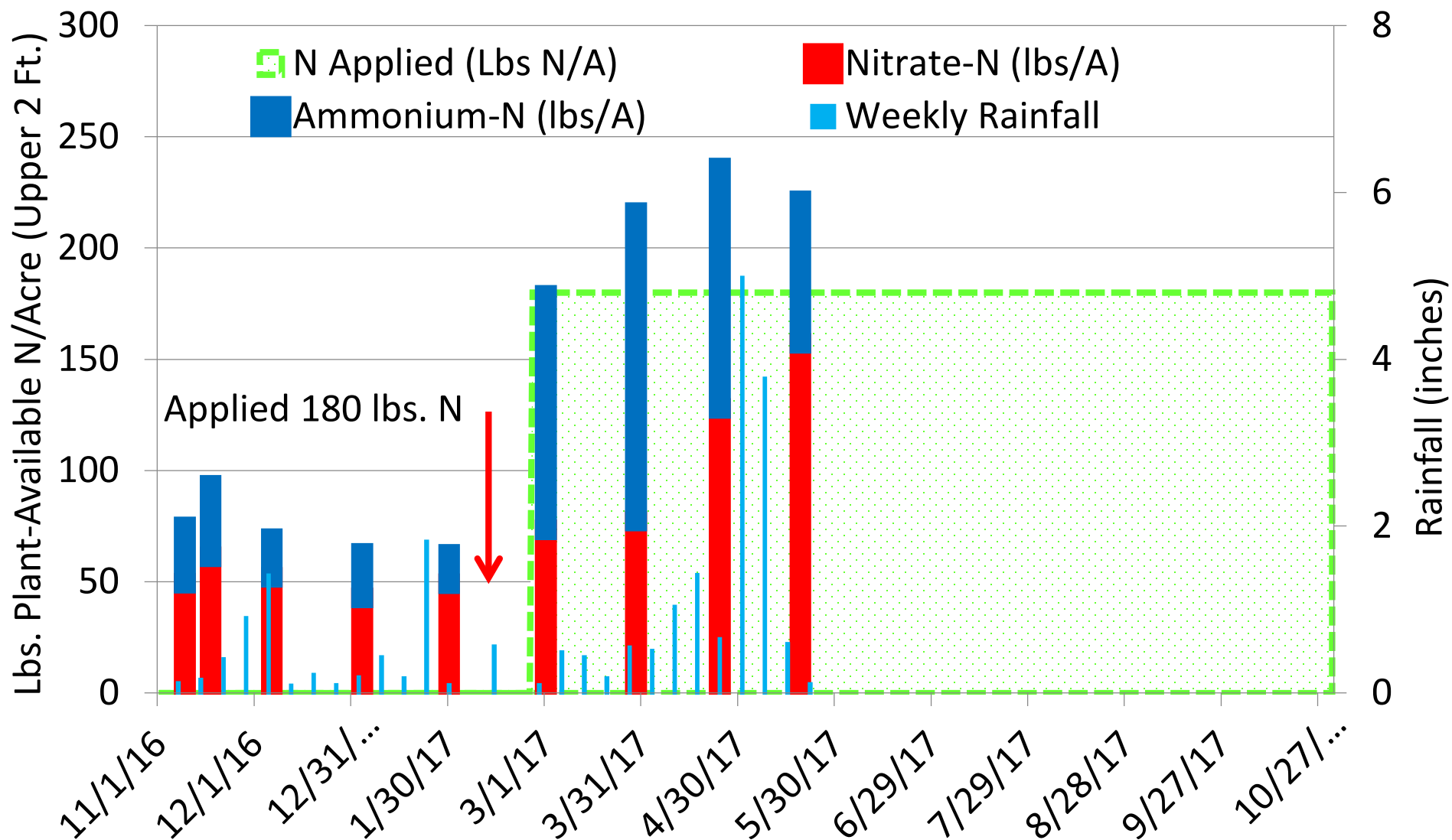


PLANT-AVAILABLE N vs. WEEKLY RAINFALL and N APPLIED (Accumulated)

FALL-APPLIED N (180 lbs)

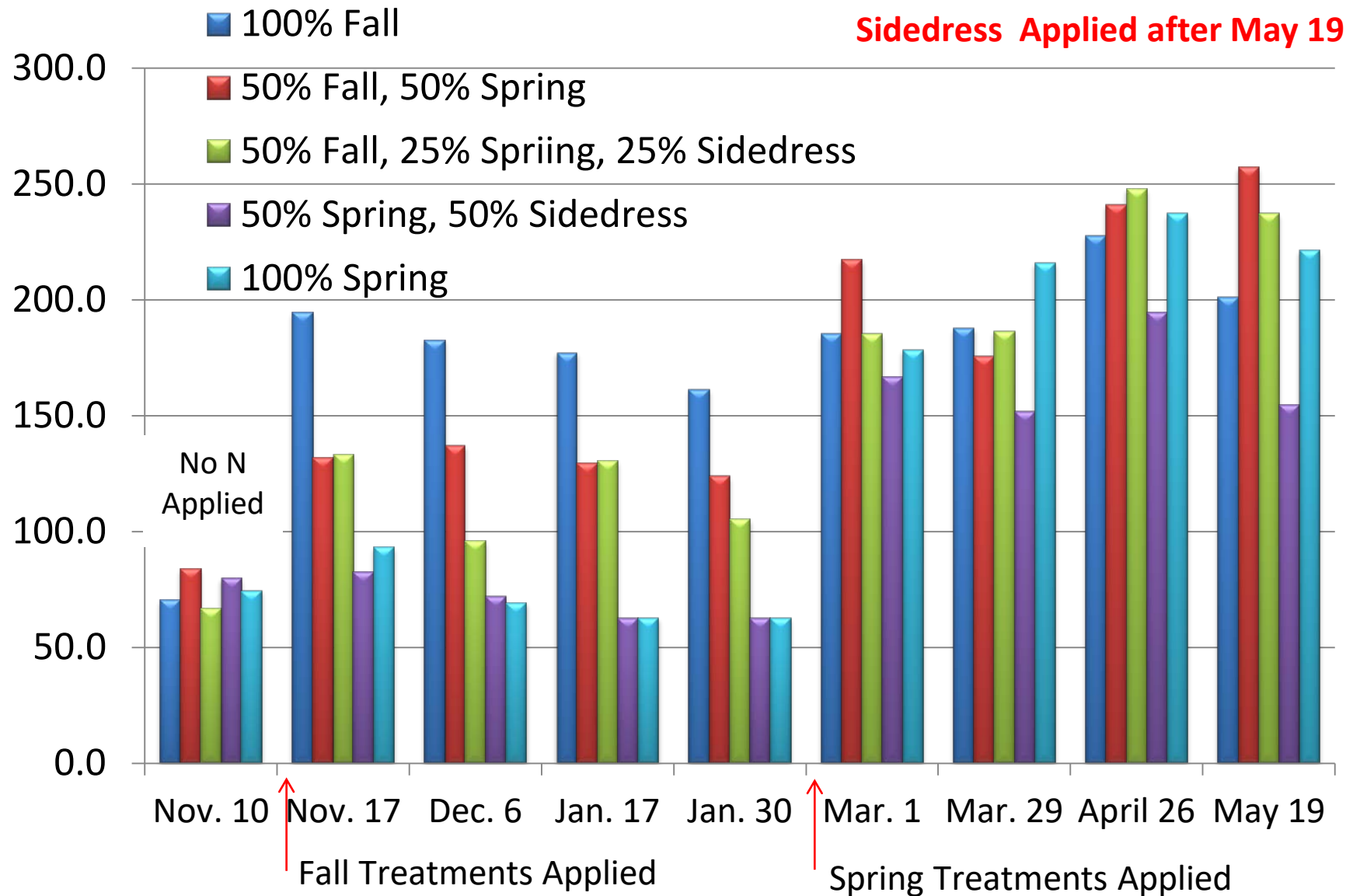


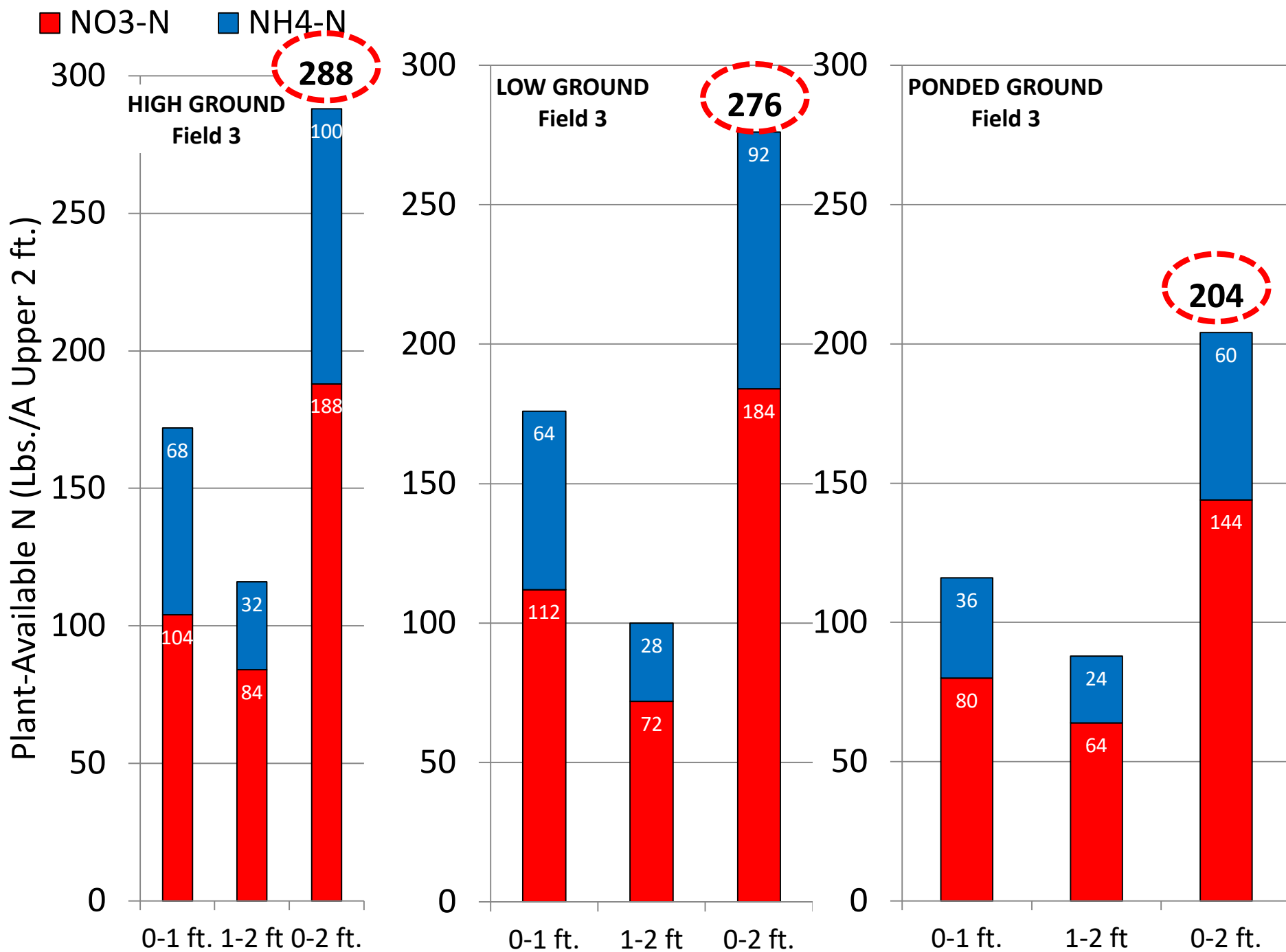
PLANT-AVAILABLE N vs. WEEKLY RAINFALL and N APPLIED (Accumulated) SPRING-APPLIED N (180 lbs.)



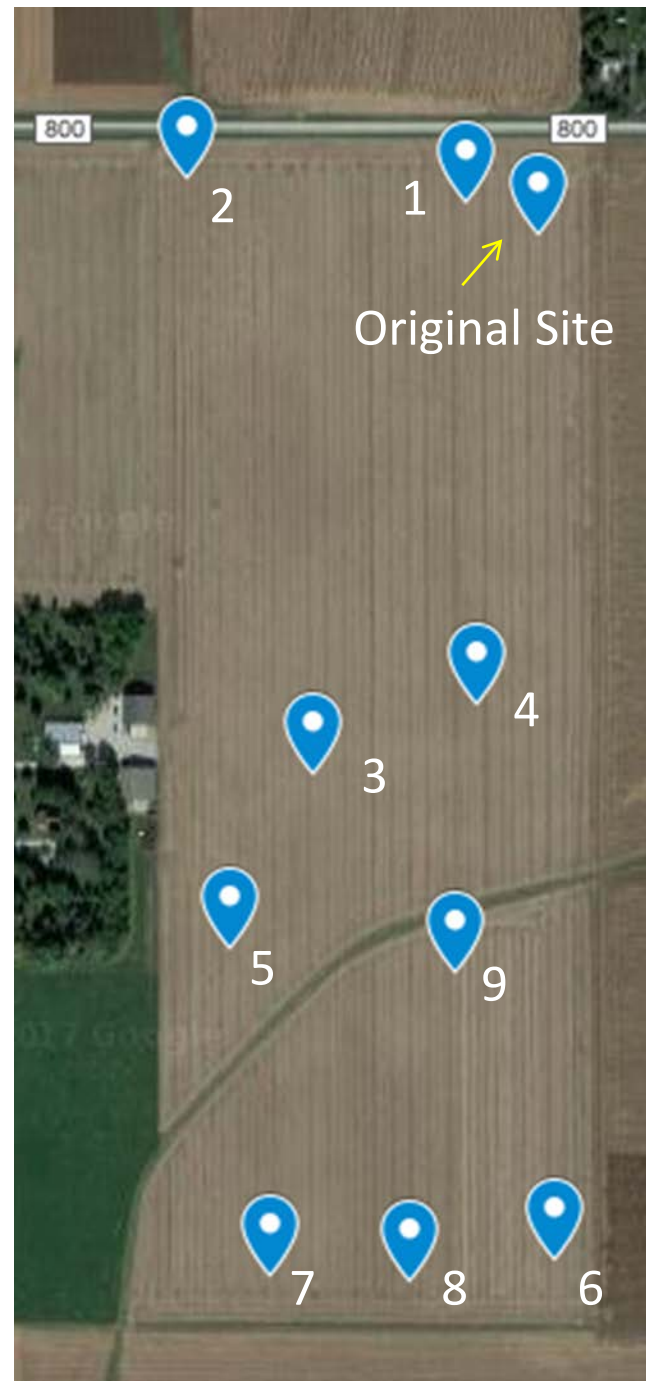
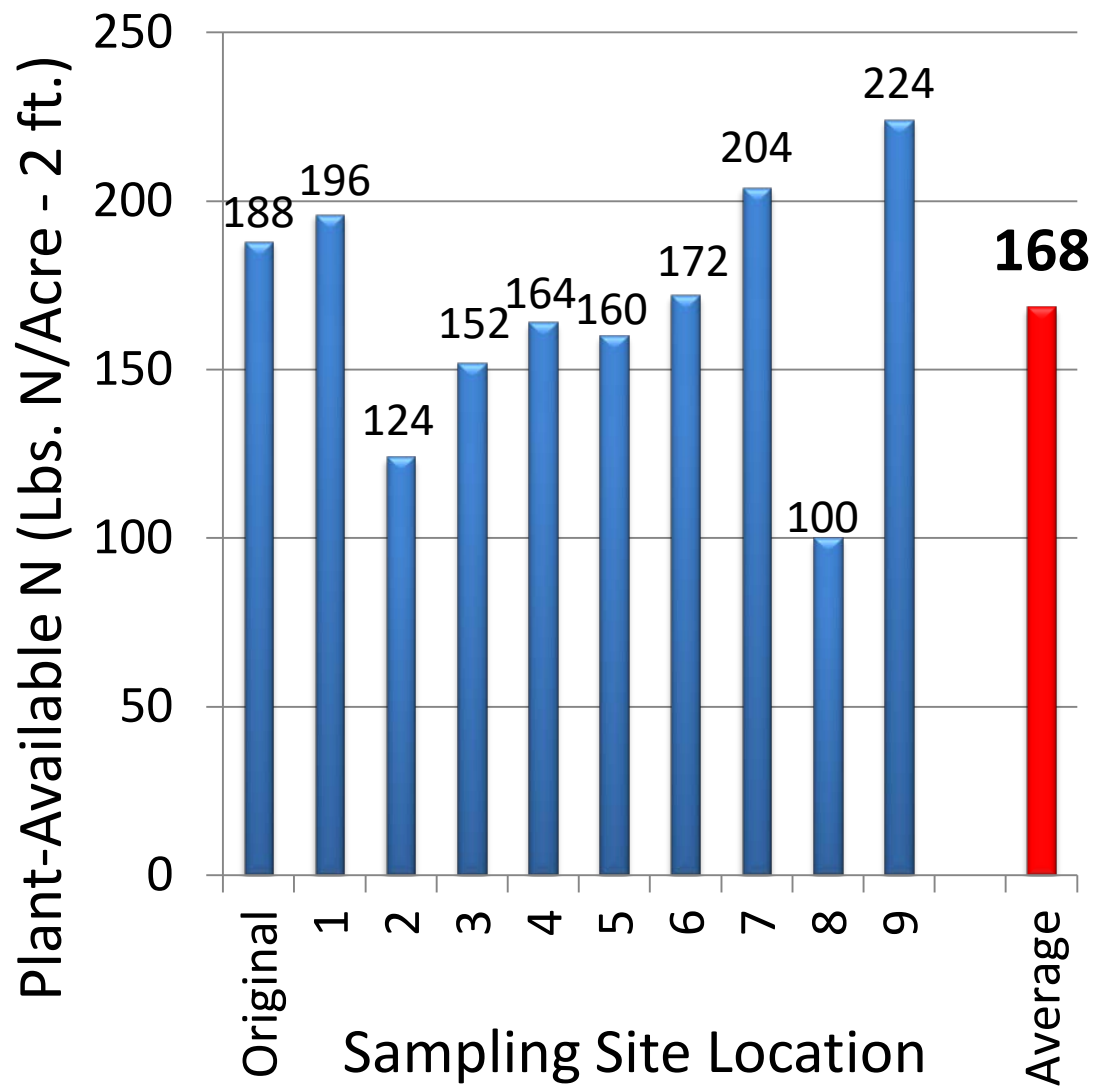
Total PAN in Upper 2 ft. of Profile Using Different N Management Systems Paris High School Project (2016-17)

Plant-Available N (Lbs. N/Acre - Upper 2 ft.)





Plant-Available N (Lbs. N/A) in Upper 2 Ft. at V6





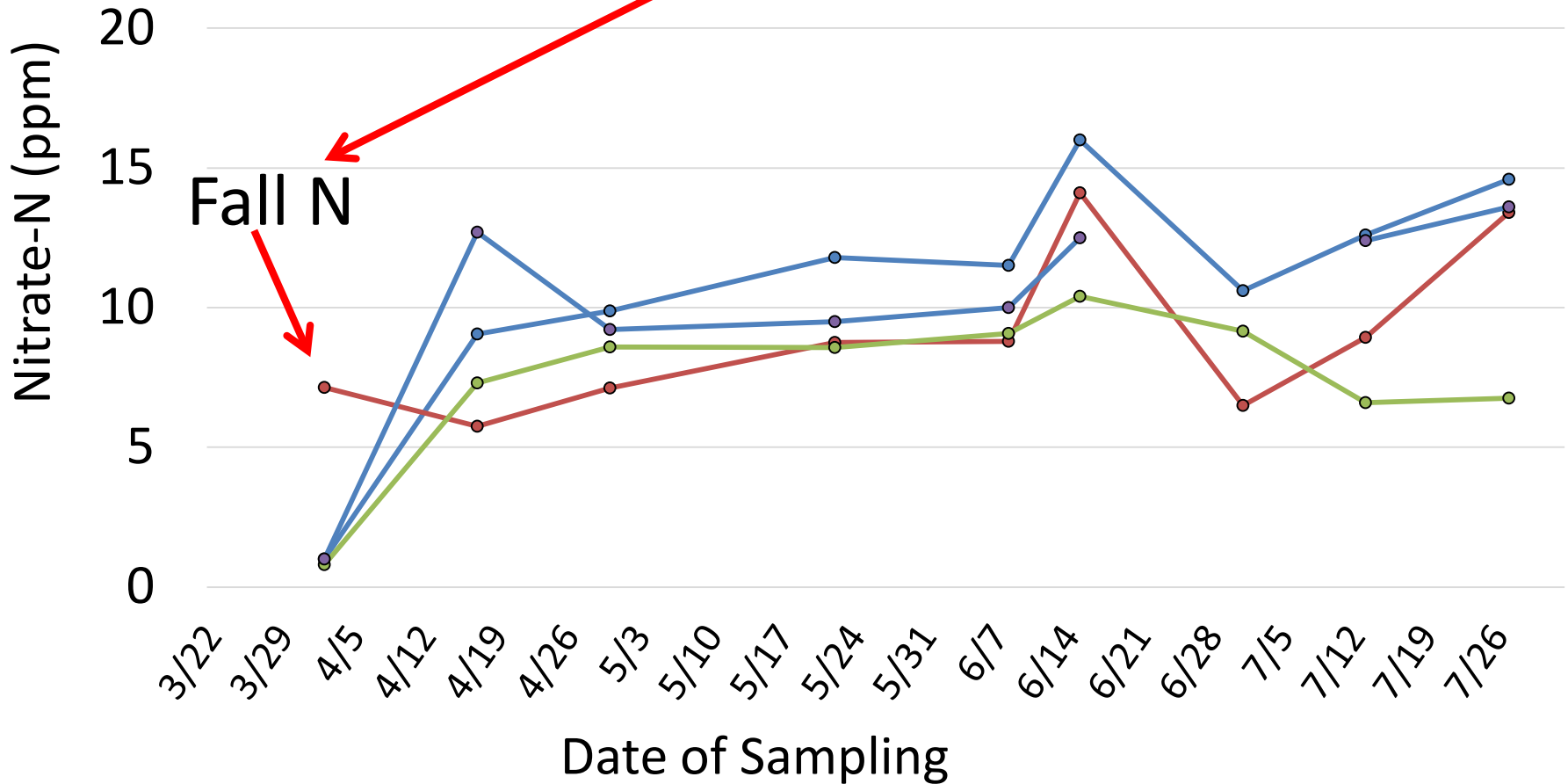
2017-18

- To learn about the dynamics of tile water concentration of nitrate-N over time.
- To recognize loss from the field
- To develop a responsible and defensible N management program

FIELD	DATE APPLIED	SOURCE	PLACEMENT	RATE N	ADDITIVE
SFI 9e	4/11/15	AA	Injected	120	None
	6/19/15	Urea	Surface	46	Agrotain
SFI 9W	11/12/14	AA	Injected	120	N-Serve
	6/19/15	Urea	Surface	46	Agrotain
SFI 2	4/12/15	AA	Injected	120	None
	6/23/15	Urea	Surface	46	None
SFI 11	None (beans)				

2016 Subsurface Field Tile Grab Samples - Nitrate-N

SFI 9E SFI 9W SFI 2 SFI 11



Teach a student to learn.
Inspire a student to lead.

To be sustainable a Nutrient Loss Reduction Strategy must focus on reducing nutrient loss through utilization and profitability. "Use it rather than lose it."

ABOUT THE PROGRAM



PROGRAM PARTICIPANTS



**Fisher
High School**

"Sometimes discovery is not just about finding something new, it is looking at something differently. It's not about what we know, but what we are willing to learn."

www.nu-tracker.com

NUTRIENT STEWARDSHIP PROGRAM

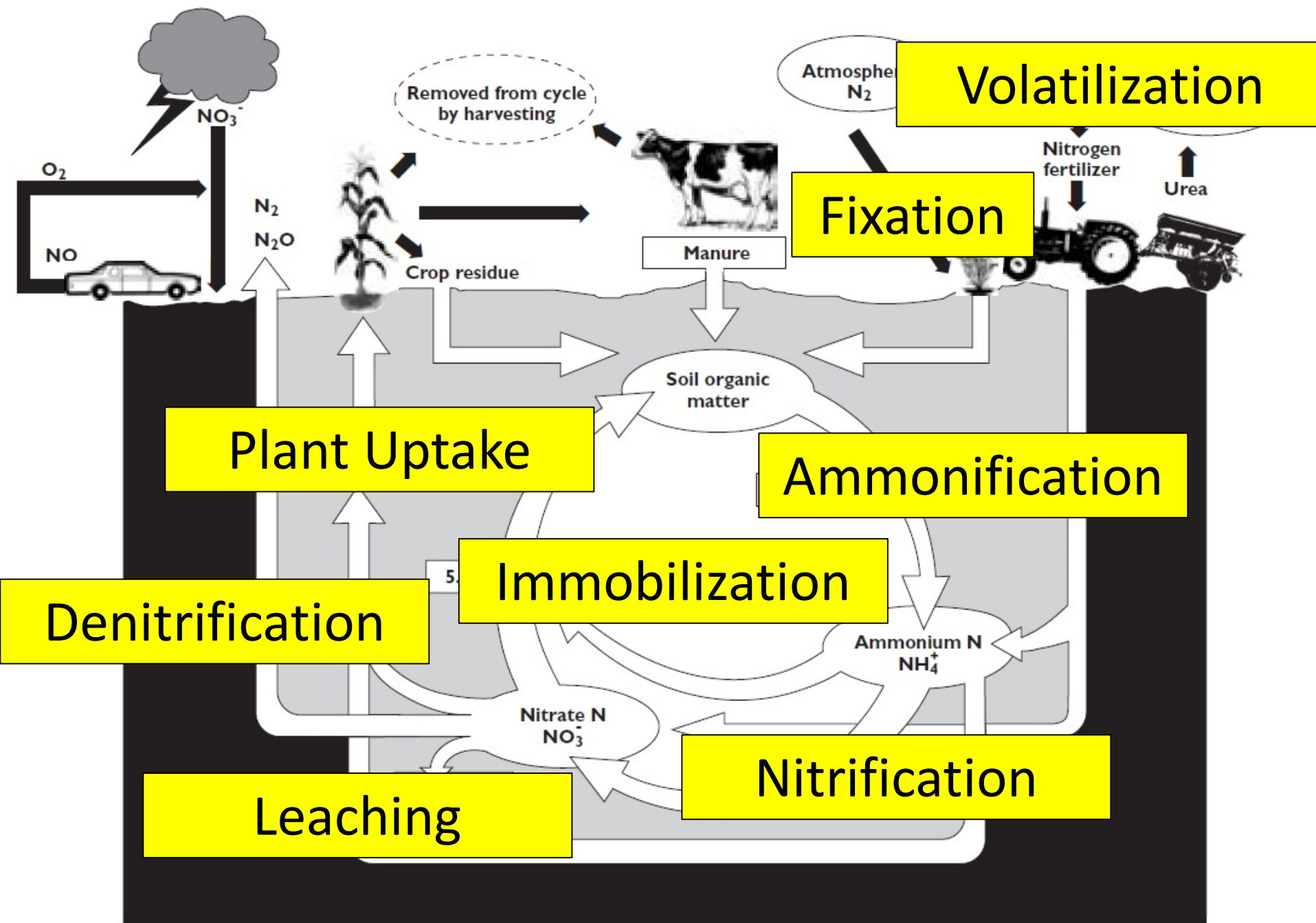
Participating High Schools

- Fisher
- Hoopeston
- Paris
- Shiloh
- Unity

70 students

PARTICIPANTS

- Local high schools
- Illini FS
- Illinois Fertilizer and Chemical Assn.
- GROWMARK Foundation
- KOCH Agronomic Services



LEARNING POINTS.

- Learn the N Cycle and explain why it is important
- Watch what happens to PAN
- Learn the importance of N Mgt.
- Share what is learned



Tell me and I forget. Teach me and I
remember. Involve me and I learn.

Benjamin Franklin

