

# Impacts of 4R Nitrogen Management on Crop Production and Nitrate-Nitrogen Loss in Tile Drainage

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**Project dates:** Fall 2014 – Winter 2017

**Project number:** 4RN-16

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Research Fund

## PROJECT GOALS

**SOURCE** Anhydrous ammonia, Anhydrous ammonia with inhibitor, urea, and Agrotain-treated urea, effects on crop yields and drainage losses of N and P

**RATE** Set N rate and in-season determination of side dress rate

**TIME** Fall versus Spring anhydrous ammonia. Split application using urea (Agrotrain-treated urea at side dress time), effects on crop yields and drainage losses of N and P

## PROJECT RESULTS

When P is managed to soil test recommendations, changes in N management have not influenced P loss to tile drains in preliminary research.

**SOURCE** No differences observed in first growing season

**RATE** All rates were the same – 135 lbs/ac N. No yield difference. No difference in flow weighted nitrate- N concentrations. Nitrates still present with no N application. Nitrate-N loads will be determined as more data is collected.

**TIME** Fall N was applied in early spring due to early freezing in 2014. No differences in 2015 Nitrate-N in tile lines



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## MEET MATT

Matt is interested in 4R research because wants to find ways we can improve farmer profitability while reducing the environmental impact.

Matt enjoys college sports and especially enjoys time on the golf course. His family has been farming in Northwest Iowa for four generations.

## WHAT DO WE DO NEXT?

- Continue data collection and analysis for remaining seasons of the project

## THE 4R PRINCIPLES

4R nutrient stewardship provides a framework to achieve cropping system goals, such as increased production, increased farmer profitability, enhanced environmental protection and improved sustainability.



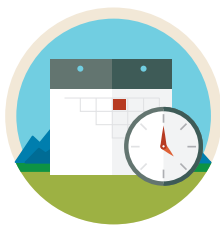
### RIGHT SOURCE

Matches fertilizer type to crop needs



### RIGHT RATE

Matches amount of fertilizer to crop needs



### RIGHT TIME

Make nutrients available when crops need them.



### RIGHT PLACE

Place Keeps nutrients where crops can use them.

## PROJECT GOALS / RESULTS KEY:



RIGHT SOURCE



RIGHT RATE



RIGHT TIME



RIGHT PLACE



4R GENERAL / OVERALL