

Byron Township Water Quality Study



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Overview

Nitrogen Loss Below Irrigated Row Crop Production
Conversion | Managed Timber to Irrigated Row Crop

- ✓ Study Opportunity
- ✓ Site History
- ✓ Study Design
- ✓ Current Findings
- ✓ Study Future



Acknowledge Partners

The MDA is not working alone on this project

On the Project Team:

- RD Offutt Farm Division
- Central Lakes College Ag & Energy Center
- Sustainable farming group
- U of M Extension
- Consulting hydrogeologist



Exciting Opportunity

A Study of Nitrogen Loss Below a Crop Root Zone

Very Unique Study

- Opportunity to study a “new” field
- Extremely rare to monitor the first season of row crop production

Important Data


- Direct assessment of nitrogen loss
- Better understand land use conversion impacts
- Inform the MDA’s Nitrogen Fertilizer Management Plan




Significance of the Study

Important Human Health Concern


- ✓ Nitrate levels above 10 mg/L in drinking water are an issue
- ✓ Specifically for infants less than 6 months of age
- ✓ Groundwater is the drinking water source for most Minnesotans



Byron Township Water Quality Study | Timeline




Before 2013




Timber Harvested

2013




Post-Tree Harvest Land Preparation


2014




Soybeans Planted




Lysimeters Installed

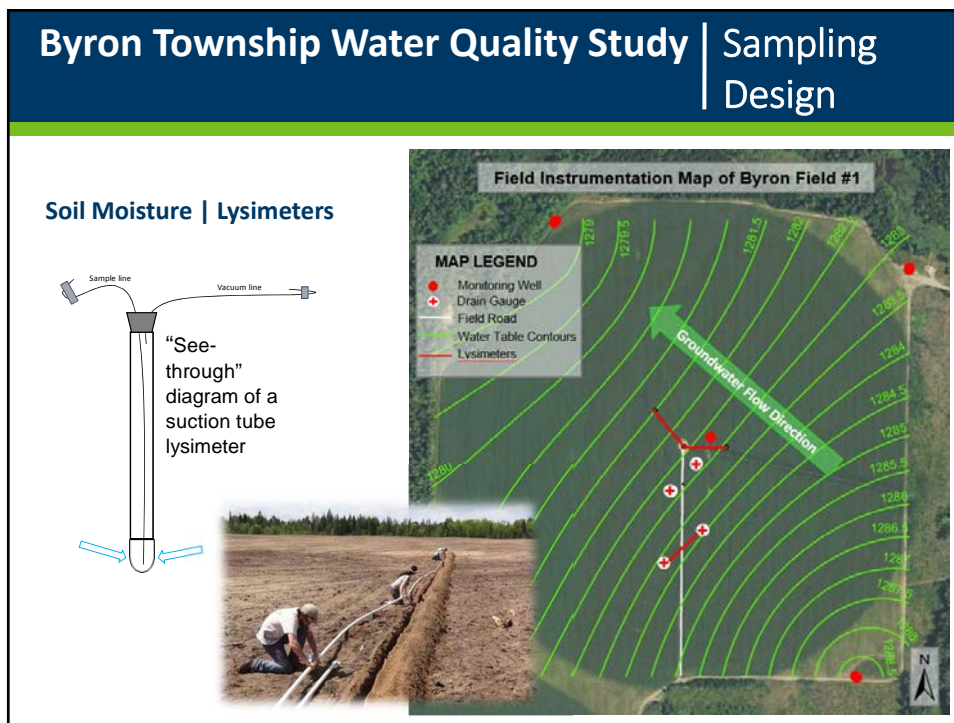
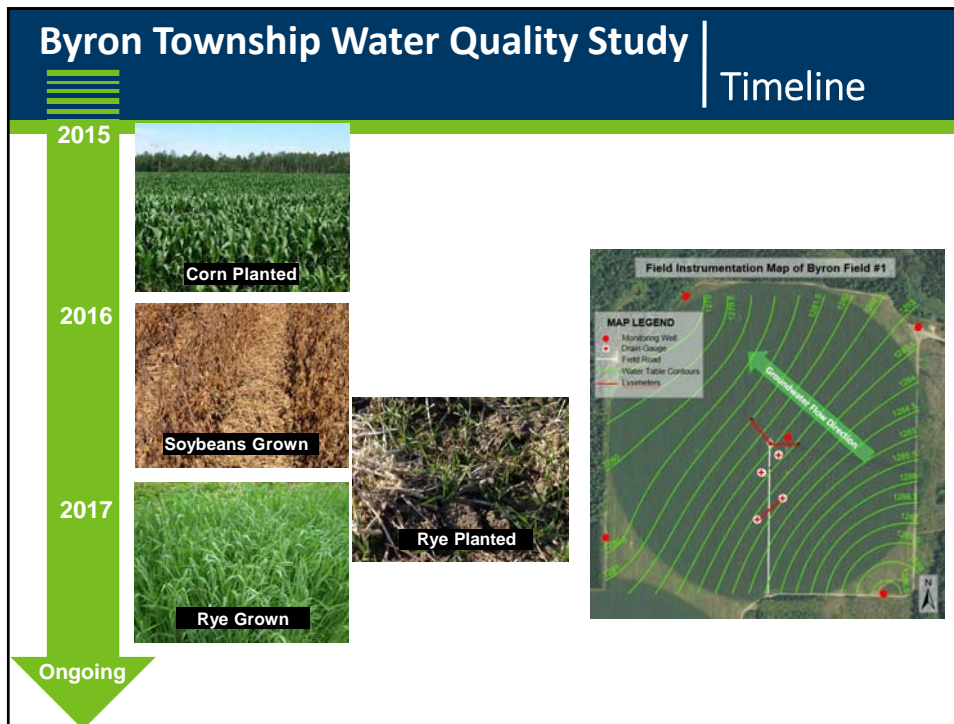


Drain Gauges Installed



Monitoring Wells Installed

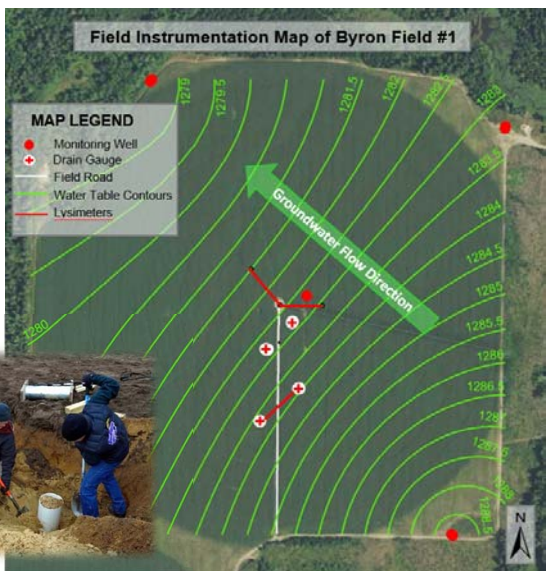
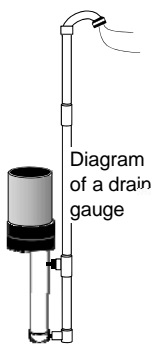




Byron Township Water Quality Study | Sampling Design

Soil Moisture | Drain Gauges

Diagram of a drain gauge




Field Instrumentation Map of Byron Field #1

MAP LEGEND

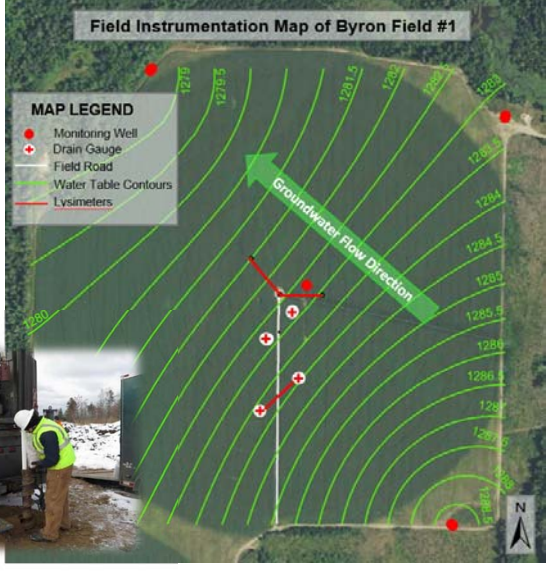
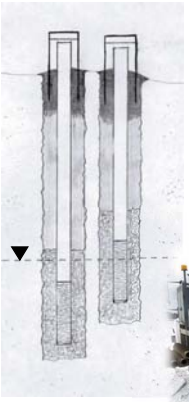
- Monitoring Well
- Drain Gauge
- Field Road
- Water Table Contours
- Lysimeters

Groundwater Flow Direction



Byron Township Water Quality Study | Sampling Design

Groundwater | Monitoring Wells




Field Instrumentation Map of Byron Field #1

MAP LEGEND

- Monitoring Well
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Groundwater Flow Direction



Byron Township Water Quality Study | Field Management


Nitrogen Best Management Practices

- ✓ Rate
- ✓ Timing
- ✓ Product
- ✓ Placement

UNIVERSITY OF MINNESOTA
EXTENSION

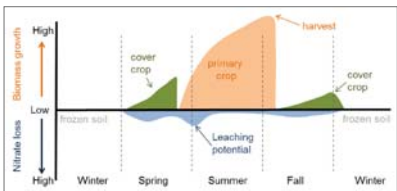
**Best Management Practices for Nitrogen on
COARSE TEXTURED SOILS**

Irrigation Scheduling



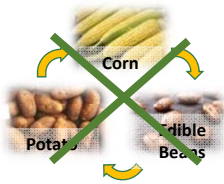
Byron Township Water Quality Study | Field Management

Cover Crops

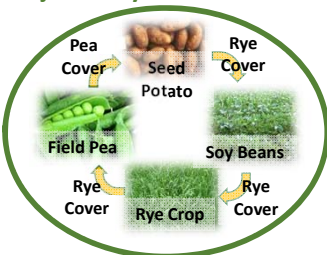


Low Nitrogen Input Crops

Common Irrigated Rotation



Projected Byron #1 Rotation

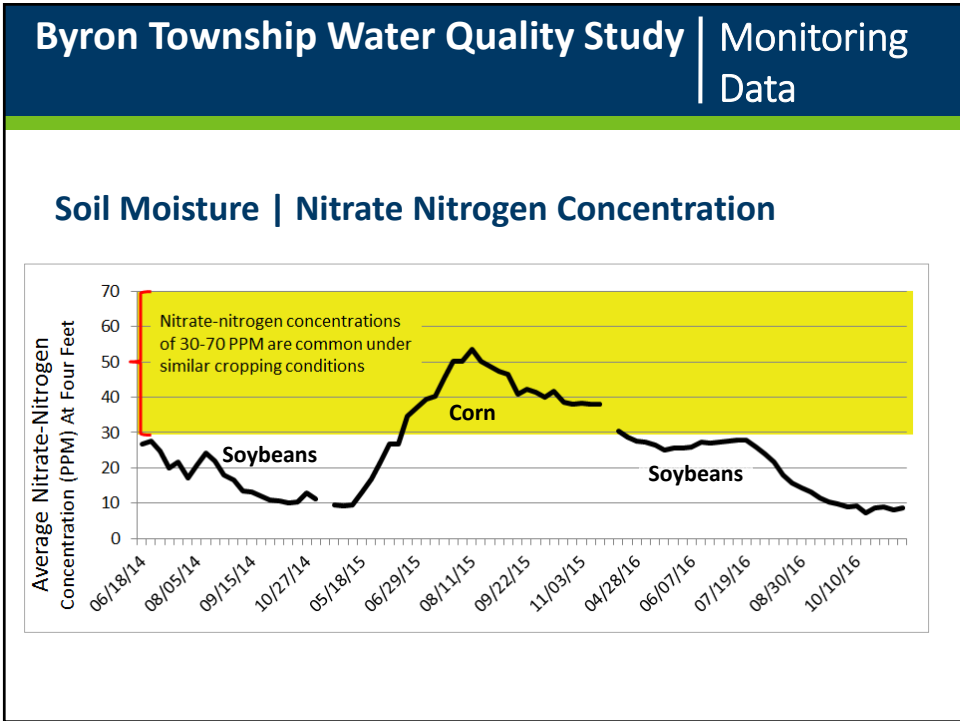


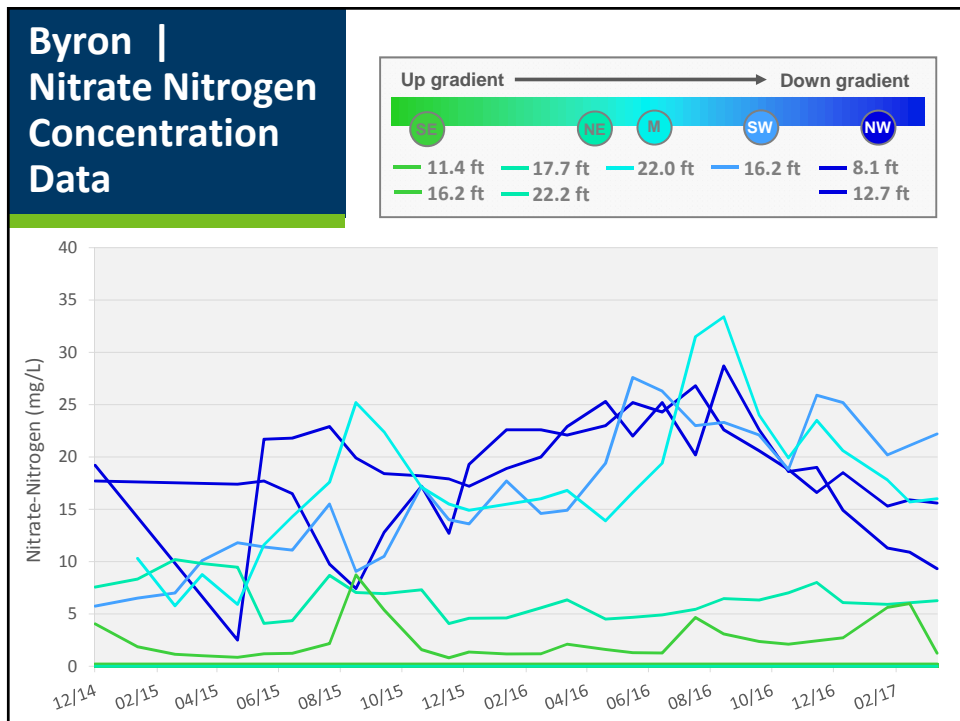
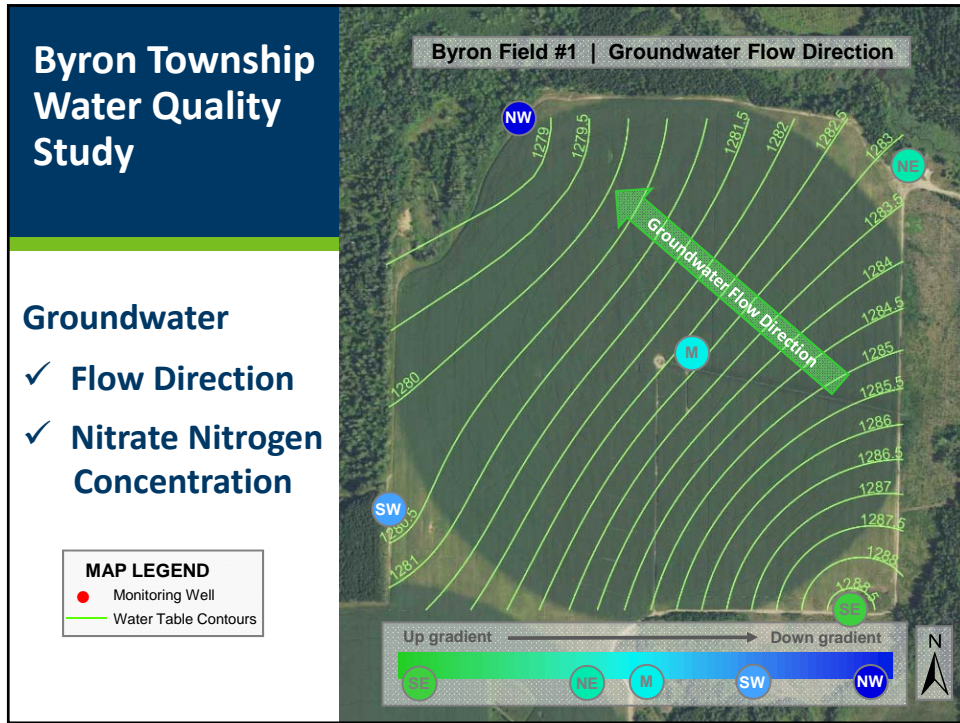
Transition Slide...

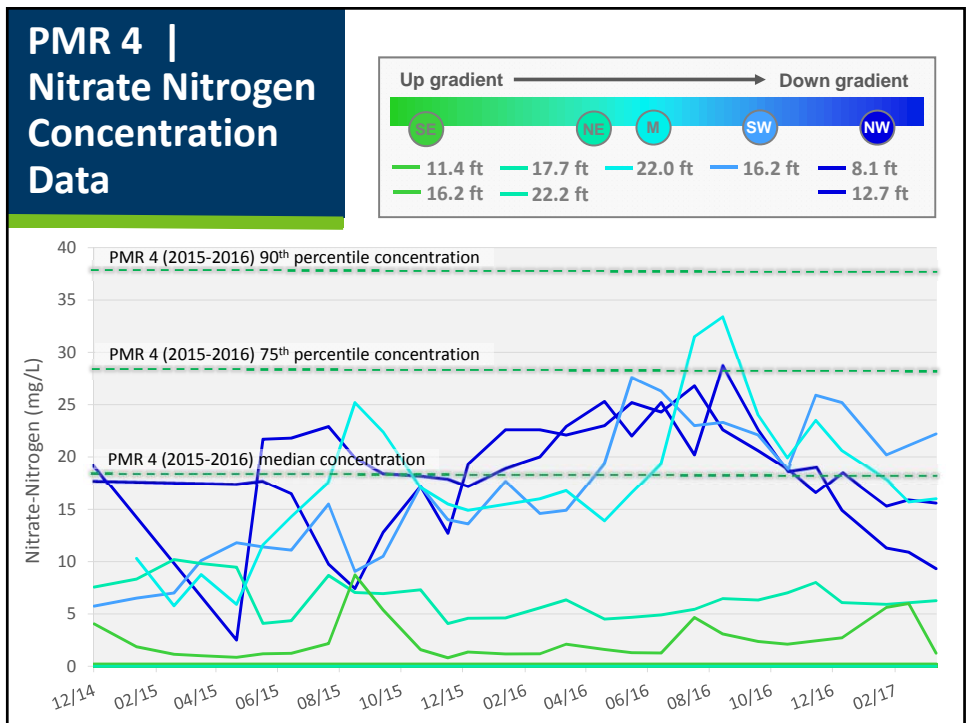
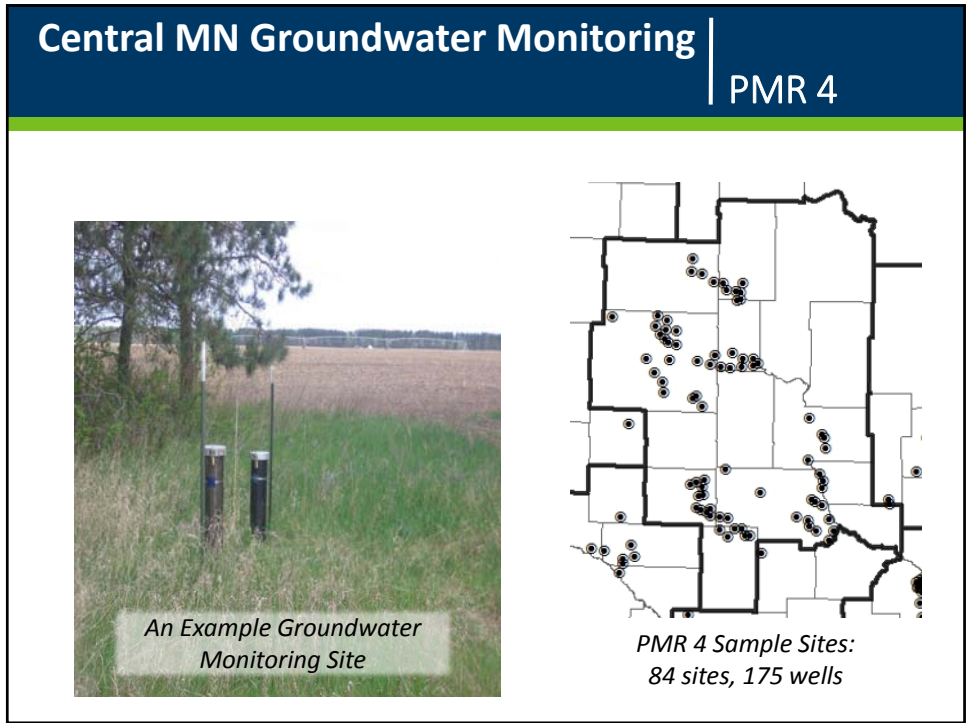
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- ✓ Site History
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 - Current Findings
 - Study Future











Byron Township Water Quality Study | Summary

- ✓ Diverse group of partners involved
- ✓ Exceptional study opportunity
- ✓ Environmental assessment of nitrogen BMPs
- ✓ Application potential across Central MN

What we learn here can inform land management policy and programs elsewhere in the state.



Thank you!

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www.mda.state.mn.us | search **Byron** to reach the study webpage