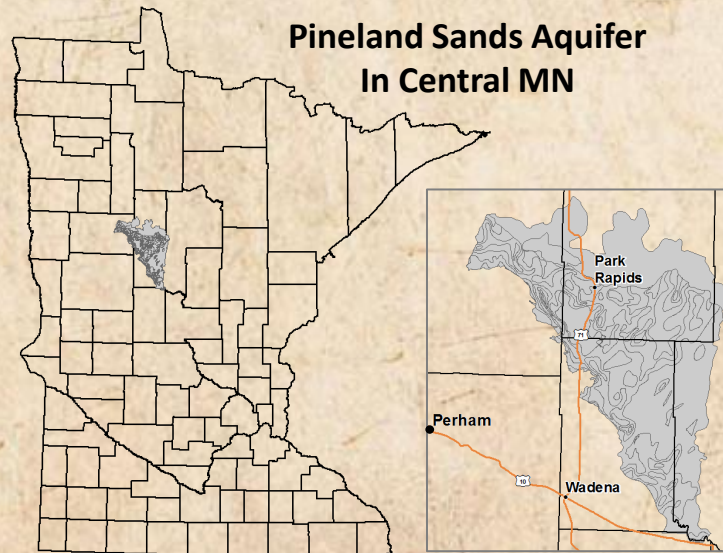


New Farming Approaches in the Pineland Sands Region



**Legislative Water
Commission Meeting**

April 26th, 2016
St. Paul, MN

Contents

- Guiding Principle
- Irrigation Optimization – Scheduling Tool
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 - Byron Township Study, City of Park Rapids
- Nitrogen Fertilizer Management Plan (NFMP)
Implementation Support



Guiding Principle

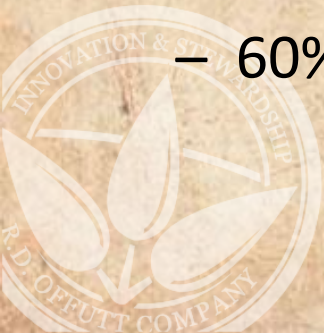


Continually seek innovative, and better ways to produce potatoes in a manner that supports our commitment to responsible land and water stewardship



Irrigation Optimization

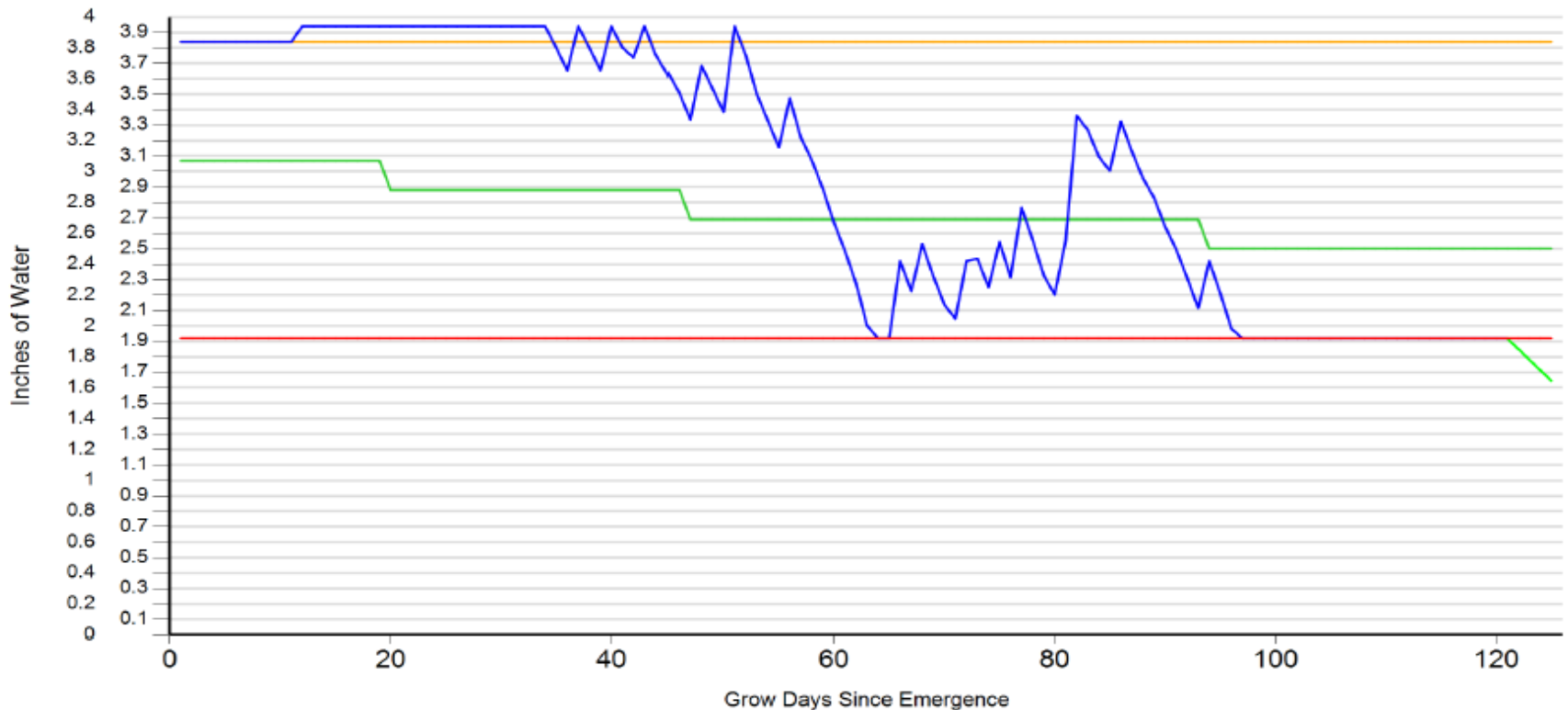
- Company developed scheduling tool
 - Soil water holding capacity mapping
- Every RDOC Farm Manager uses this tool on all irrigated acres
- Irrigation scheduling based on crop need
 - Consideration for crop evapotranspiration, canopy, forecasted rain
 - Optimization of irrigation use
 - 60% average usage of allocated irrigation water



RDOC Irrigation Scheduling Tool

Inches to Full Field Capacity: 2.2 -- Rain To Date, since Emergence: 8.5" -- Irrigation To Date: 5"

Emergence Date: 6/1/2015 -- ET: 0.069 -- MAD: 35% -- CANOPY %: 100 -- Variety: Alturas



Field Water Capacity MAD Water Available Wilting Point

A New Pea Crop

MN 2015 introduction

- 1,500 est. acres in 2015
- 6,000 est. acres in 2016
- Projected growth TBD

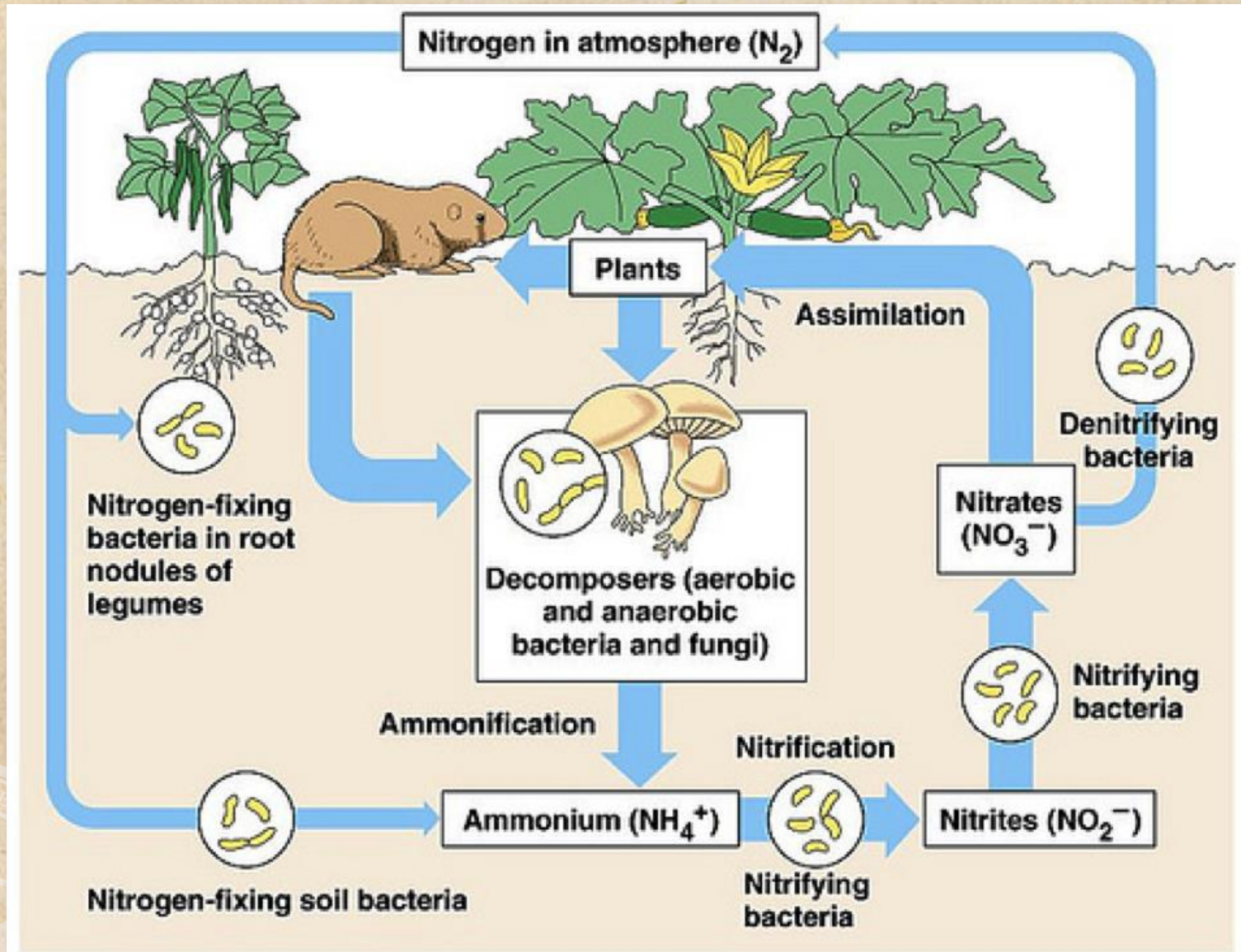


Legumes (peas) Added Into Crop Rotation

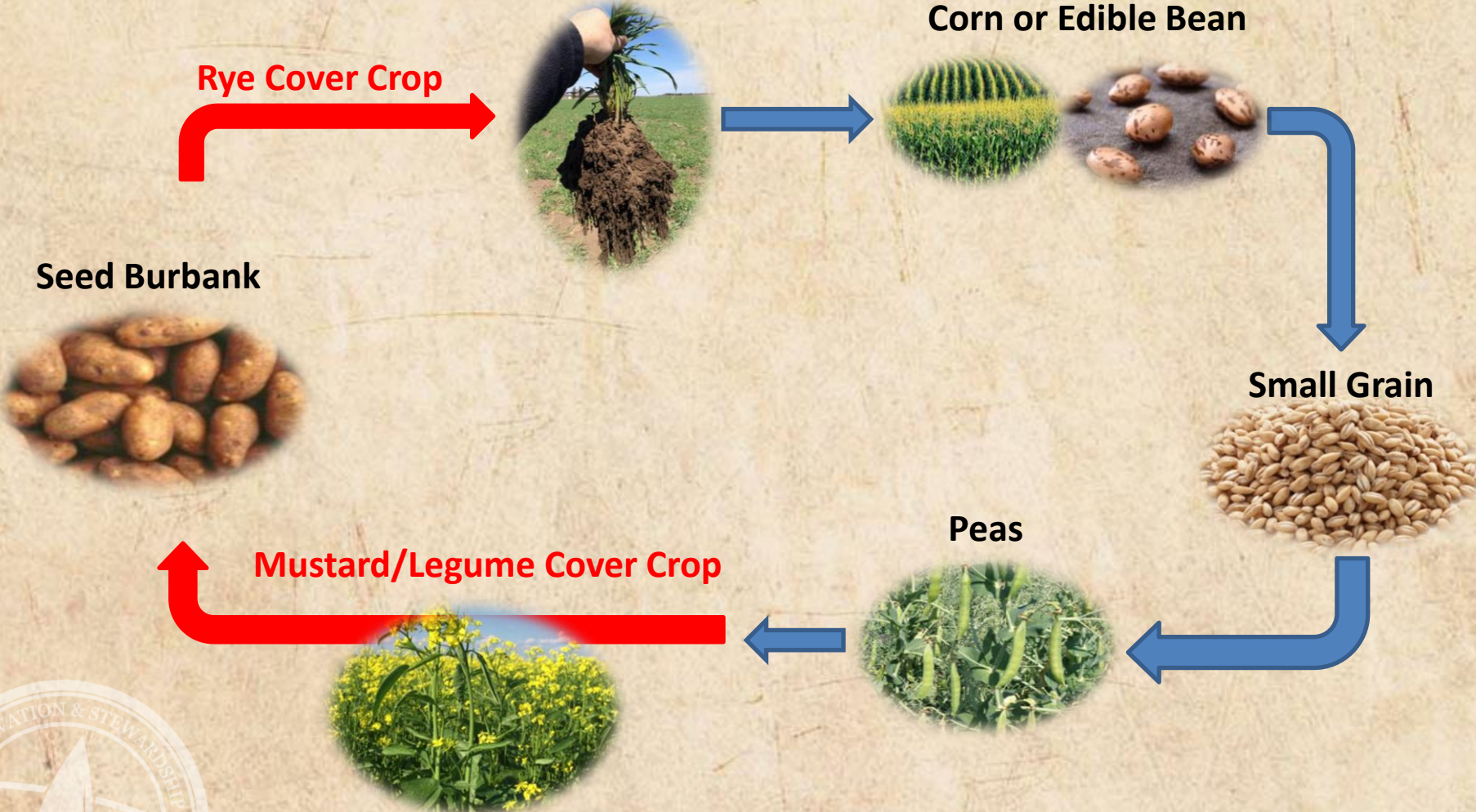
- Peas grown prior to potato crop
- Replace edible bean or expand to 4 year crop rotation
- Natural “nitrogen fixer”
- Early harvest allows for beneficial cover crop establishment
- Used to make Harvest Snapea Crisps



How Legumes Affect Soil Health



Example of Beneficial Crop Rotation



Beneficial Cover Crops



Recent rye cover crop photo in Central MN. This stand was planted by RDOC following the 2015 potato harvest. (picture taken 4-20-16)

- Company history of cover crop trials
- Length of growing season presents challenges



www.sare.org

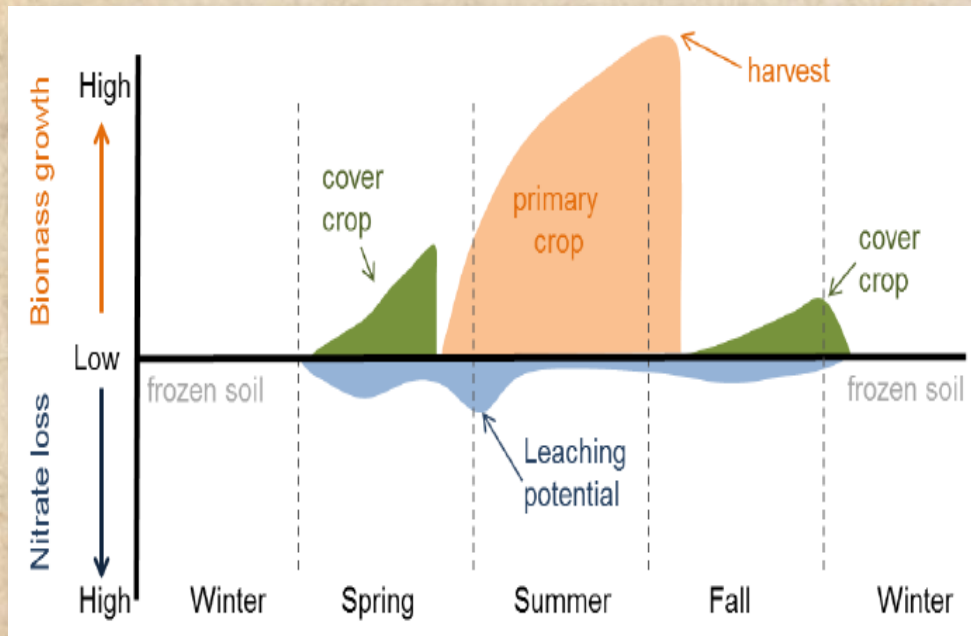
According to the Sustainable Agriculture Research and Education Program:

“Nutrient catch crop. Rye is the best cool-season cereal cover for absorbing unused soil N. It has no taproot, but rye’s quick-growing, fibrous root system can take up and hold as much as 100 lb. N/A until spring, with 25 to 50 lb. N/A more typical ([422](#)).”

Web Link: <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition/Text-Version/Nonlegume-Cover-Crops/Cereal-Rye>

Cover Crops

Mustard/rye cover crop prior to potato plantings



- Naturally sequesters and scavenges nitrogen
- Builds soil health
- Prevents nitrogen leaching
- Prevents erosion
- ✓ 1,500 est. acres in 2015
- ✓ 6,000 est. acres in 2016 (target)



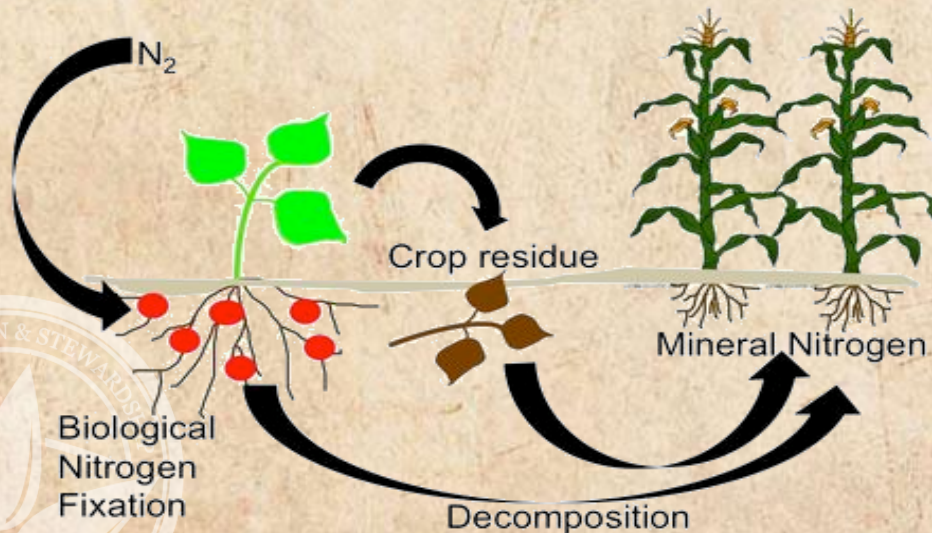
“Green Manure” Crop

- Legume cover prior to potato
 - Fix atmospheric N that will be available to the potato crop, reducing amount of synthetic nitrogen applied



Mustard close-up taken before incorporation in Central MN (picture taken 9-25-15)

Legume based cropping system



Incorporating legume green manure



On-Farm Cover Crop Research



Multi-species cover crop planted in 2015

Multi-species cover crops

- Increase diversity of plant species growing within a field for multiple benefits

Companion crops with potato

- Fix nitrogen
- Attract beneficial insects
- Suppress soil-borne disease



Potato inter-seeded with sunflower



Enhancing Pollinator Habitat

2015



- Planted approximately 650 acres of perennial pollinator/butterfly habitat
- Planted approximately 1,500 acres of annual mustard

2016



- Partner with MN Deer Hunters Assn., Pheasants Forever to maximize plantings
- Target approx. 550 acres of additional perennial Pollinator/Butterfly habitat
- U of M to survey pollinator habitat for species diversity
- Target 6,000 acres of annual mustard



Support for U of M Research



- Long history of cooperation and support of U of M research
- On-farm research and demonstration
- Recent 4-year replicated study on nitrogen rate and source
 - Included monitoring of soil moisture and nitrogen levels
- On-farm research to support company nitrogen management practices



RDOC History of Partnerships

Byron Township Study

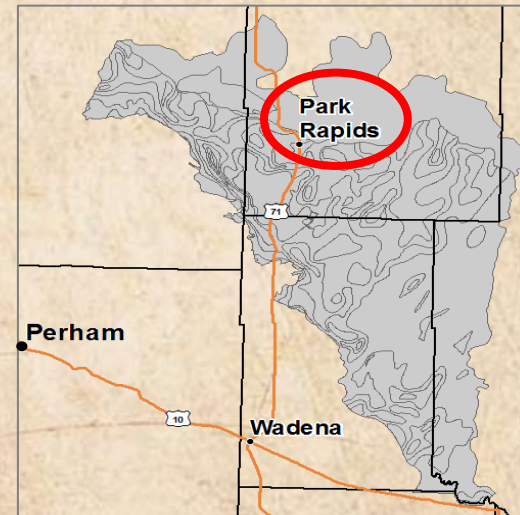


sustainable
farming
association



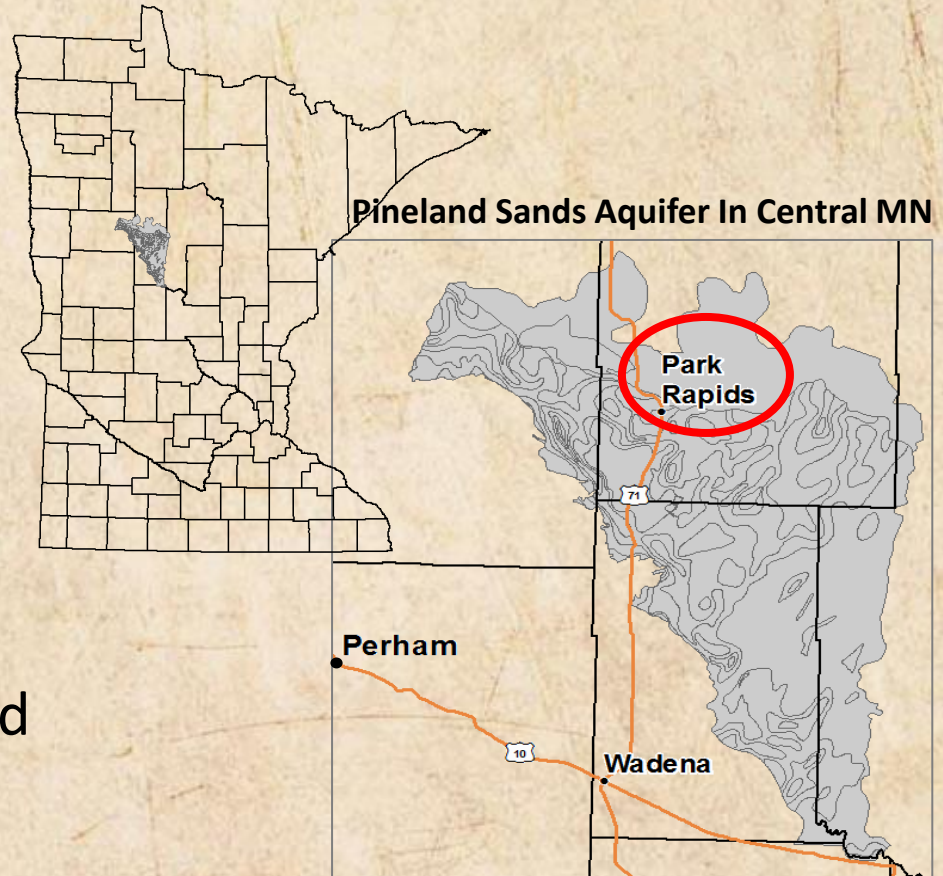
Work with Community
Water Suppliers

Pineland Sands Aquifer In Central MN



Proactive Farm Plantings in Consideration of Wellhead Protection Areas (WHPAs)

- 2011 | Sudan Grass
- 2012 | Alturas Potato
(requires 35% less N)
- 2013 | Alturas Continued
- 2014 | Alfalfa Introduced
- 2015 | Alfalfa Continues
- 2016 | Alfalfa & Peas Introduced



Nitrogen Fertilizer Management Plan Support

- Committed to local advisory team involvement
- Supportive of private well nitrate testing
- Offer to require nitrogen BMP use in private land lease agreements
- Implementing alternative management tools in highly sensitive areas



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Take Home Points

- R.D. Offutt Company staff are an active part of efforts underway to protect groundwater from commercial nitrogen fertilizer in Central MN
- This presentation covers just some of the activity that the company is doing as an active part of these efforts



Thank you for your time



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R.D. OFFUTT

The logo features a stylized green plant with three leaves and a central stem with a downward-pointing arrow.

COMPANY
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