“Water Quality Perspectives for Agriculture Production”

Legislative Subcommittee on Water Policy

October 20, 2021

Keith Olander, AgCentric Executive Director

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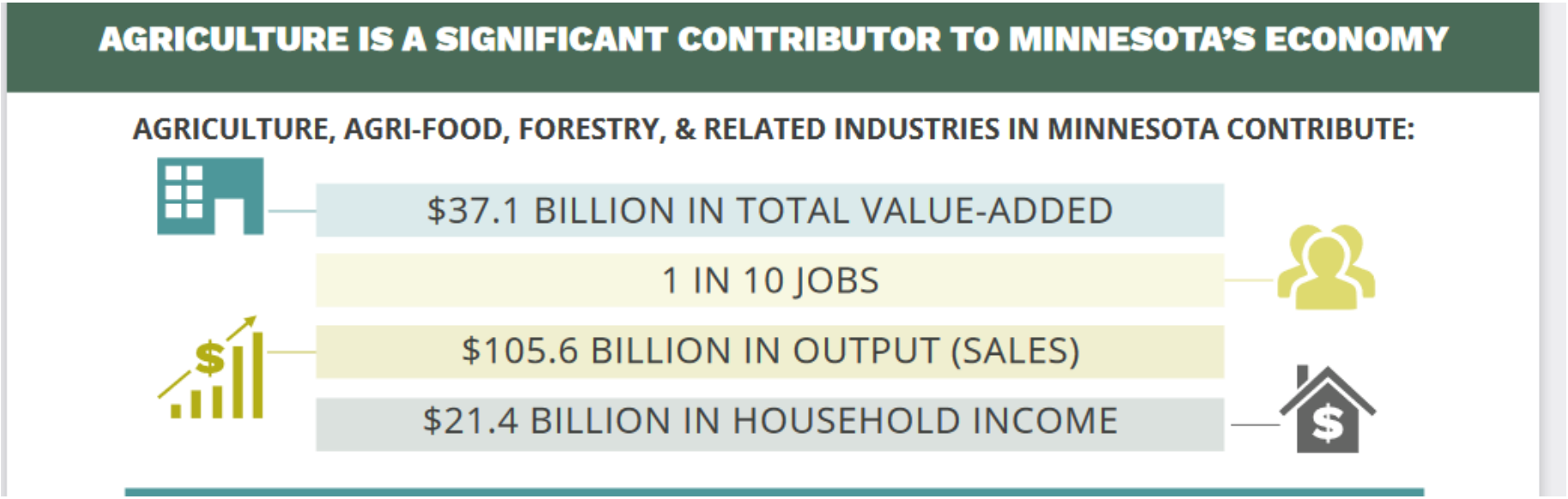
Topics to cover:

- Review
- Byron Township Projects
- Marginal Land – or is it?
- Precision Irrigation Project to drive innovation in irrigated agriculture
- Why should you care?

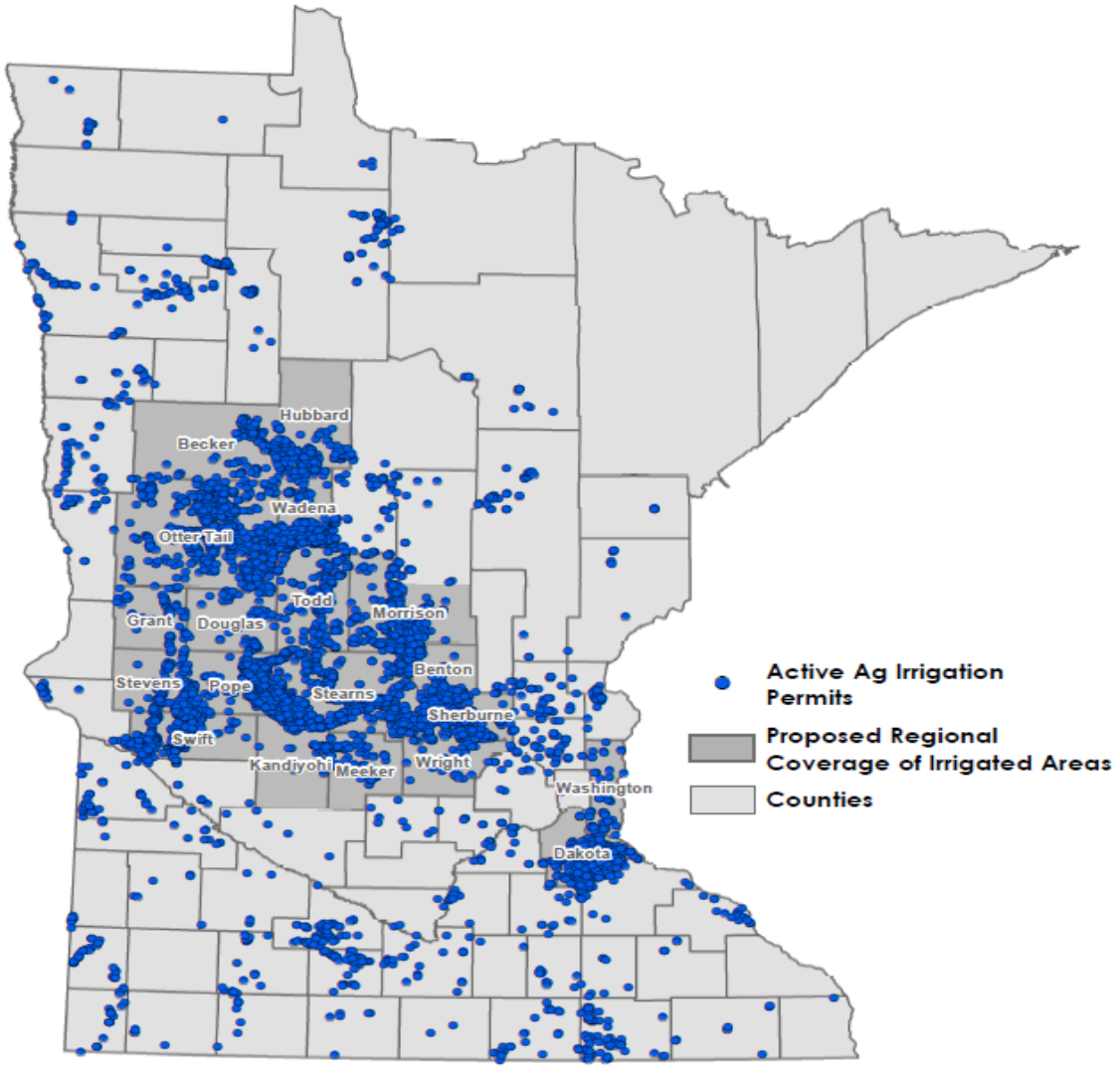
Minnesota Agriculture

- $106 Billion Dollar Value Added
- 388,134 jobs



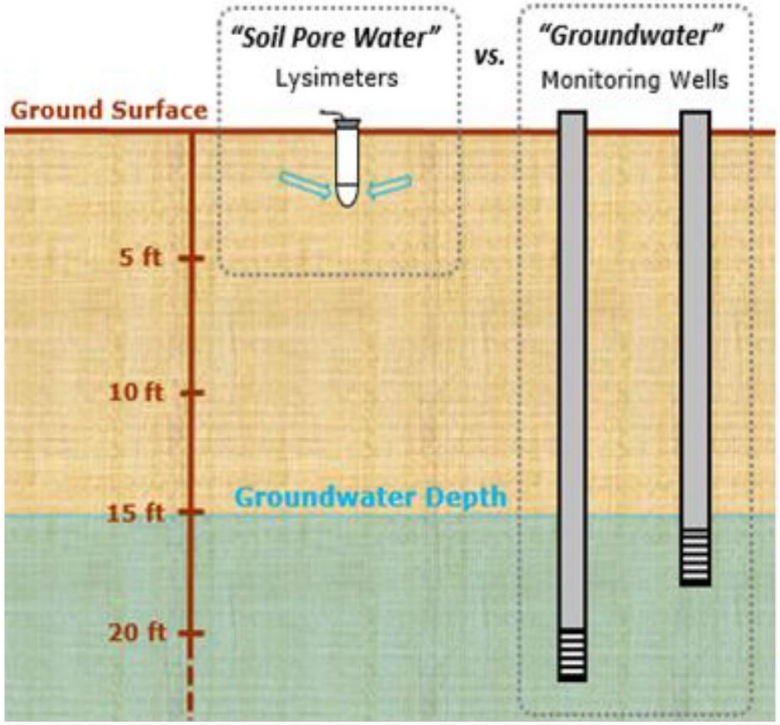
- Minnesota has over 500,000 acres of irrigated land.

Active Agricultural Irrigation Water Use Permit Locations in Minnesota



ata Source: Water Appropriation permit locations from MN DNR MPARS permitting database
https://www.dnr.state.mn.us/waters/watermgmt_section/appropriations/wateruse.html

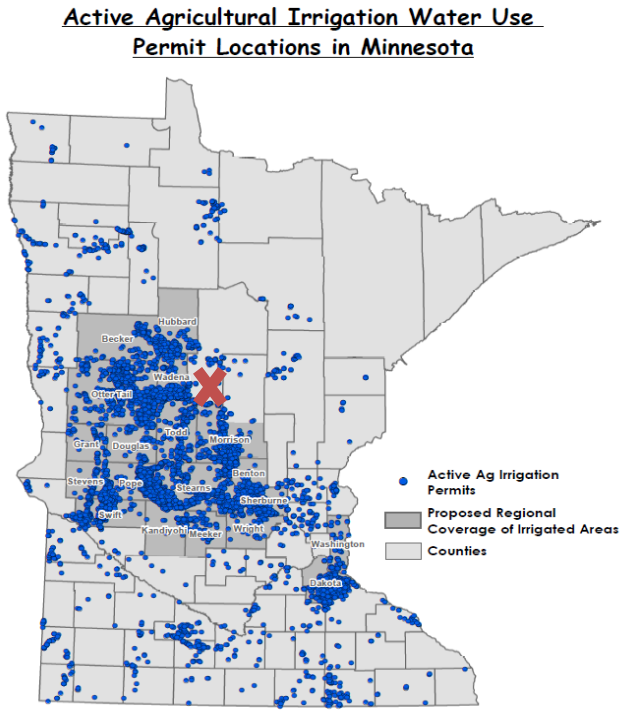
Knowing your terminology: Groundwater vs. soil pore water



This image illustrates the vertical difference between soil pore water collected in lysimeters versus groundwater collected in monitoring wells.

Byron Township

- Located in Cass County
- Was traditional row crop production, then row crop tree production, now back to traditional row crop production
- Sold land after tree harvest
  - Left stumps/brush



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Byron Township

- 2014 – Partnership Developed between Central Lakes Ag & Energy, R.D. Offutt to enter voluntary research project
- Team management – meet 3 times per year

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sfa FARMER-to-FARMER NETWORK

Northwest AgwaTek Solutions NWATS

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Byron Township Project

- **Project Mission:**
  - Design and execute a land management plan that fosters soil health and provides adaptive management options that can be replicated to ultimately balance financial and environmental sustainability

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Byron Township Project

- **Management Practices**
  - Innovative cropping practices to reduce nitrate loss
  - Using technology/data driven decisions on irrigation use
  - Following or incorporate each crop with a cover crop to capture and hold nitrogen for following season.
  - Monitoring and adaptive management
  - Utilizing U of M nitrogen guidelines
  - Split nitrogen applications
  - Incorporation of nitrogen fertilizers
  - Adaptive soil health management

Byron Township Project

- **Alternative Management Tools (AMTs)**
  - Cover crops
  - Managed Grazing
  - Extended rotation including low nitrogen demanding crops
  - Growing low nitrogen demanding crops
  - No till/reduced till incorporated into crop system

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https://www.mda.state.mn.us/protecting/cleanwaterfund/gwdwprotection/byrontownship

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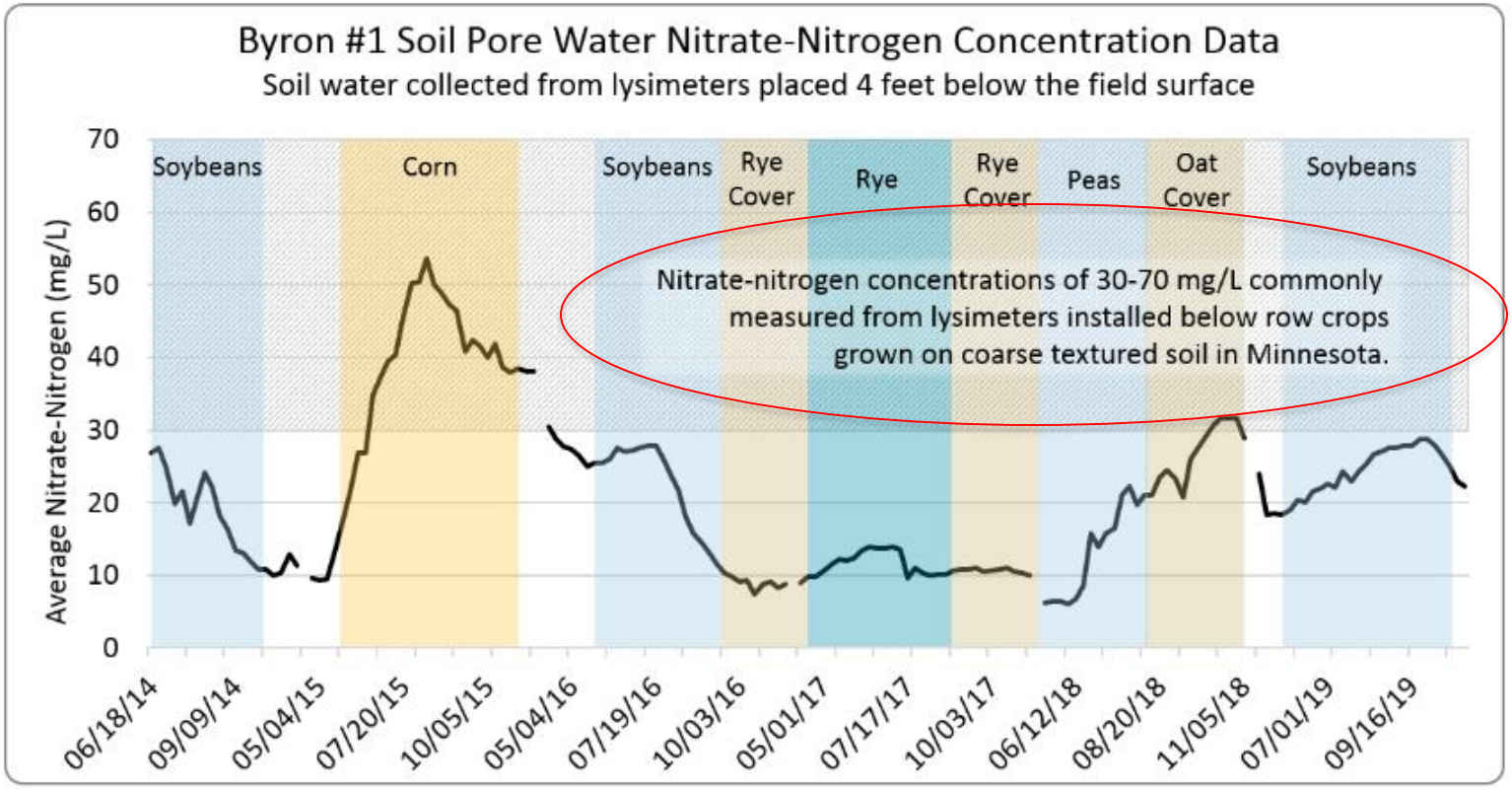
Byron Township Project



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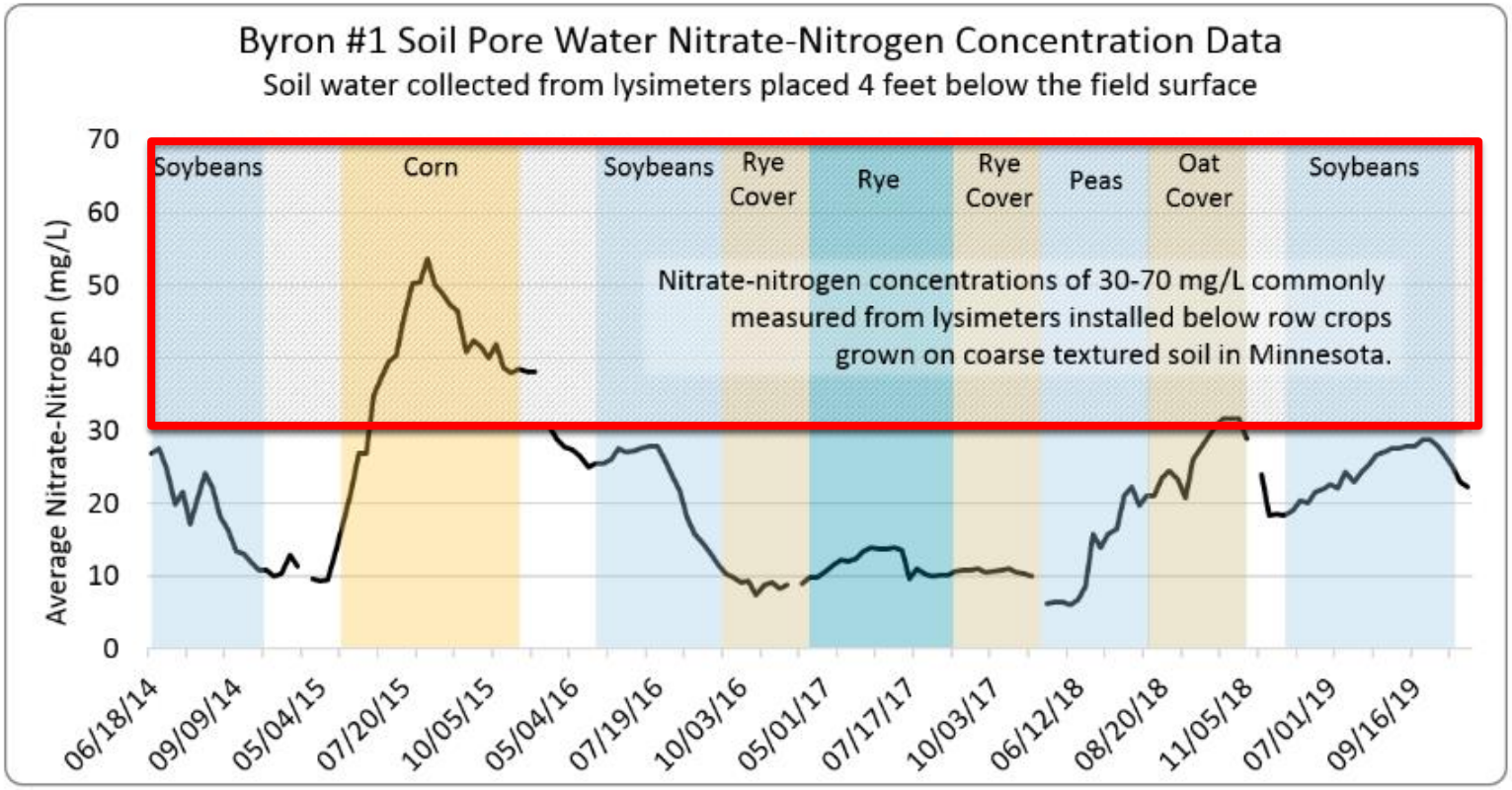

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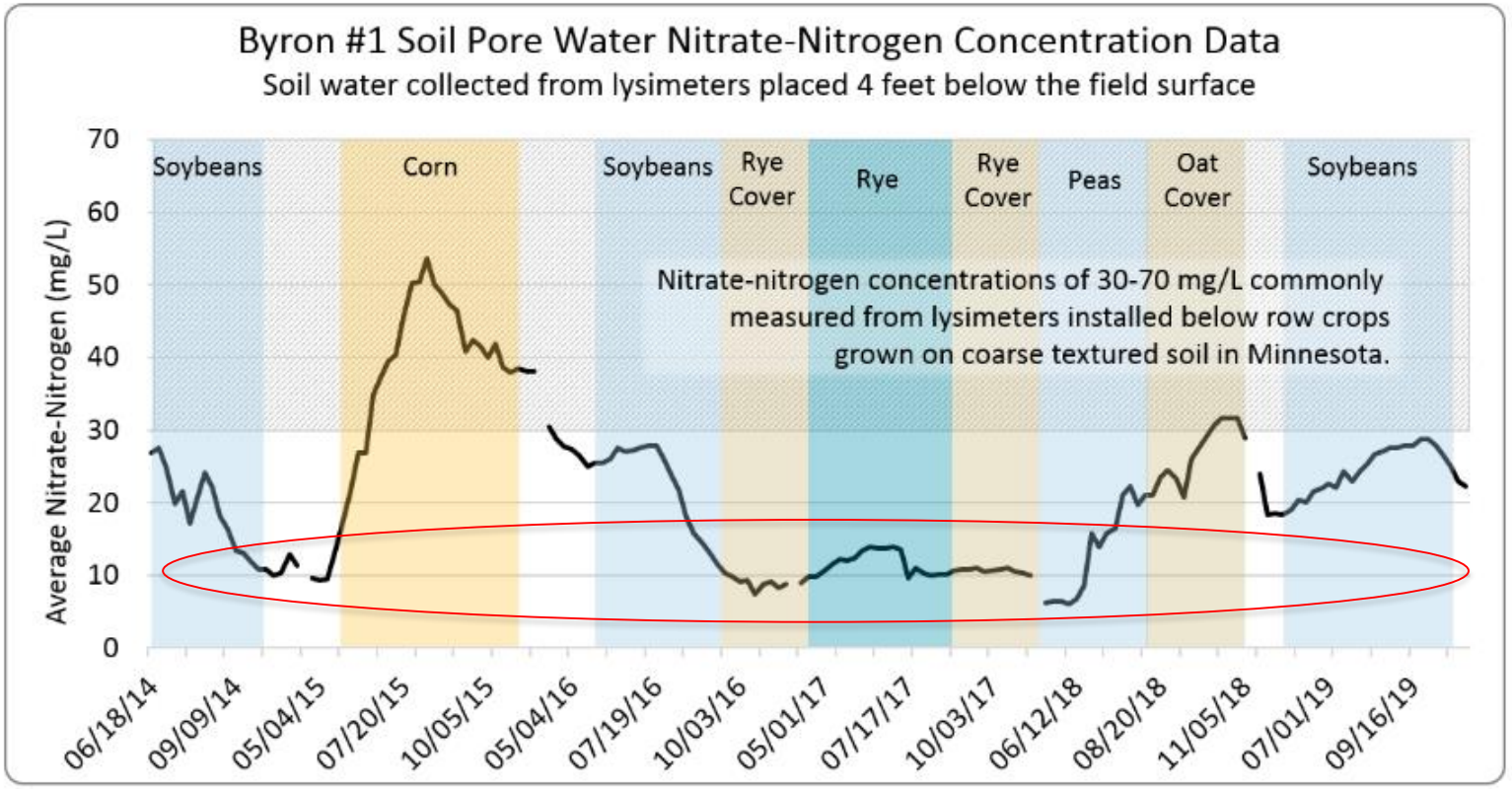

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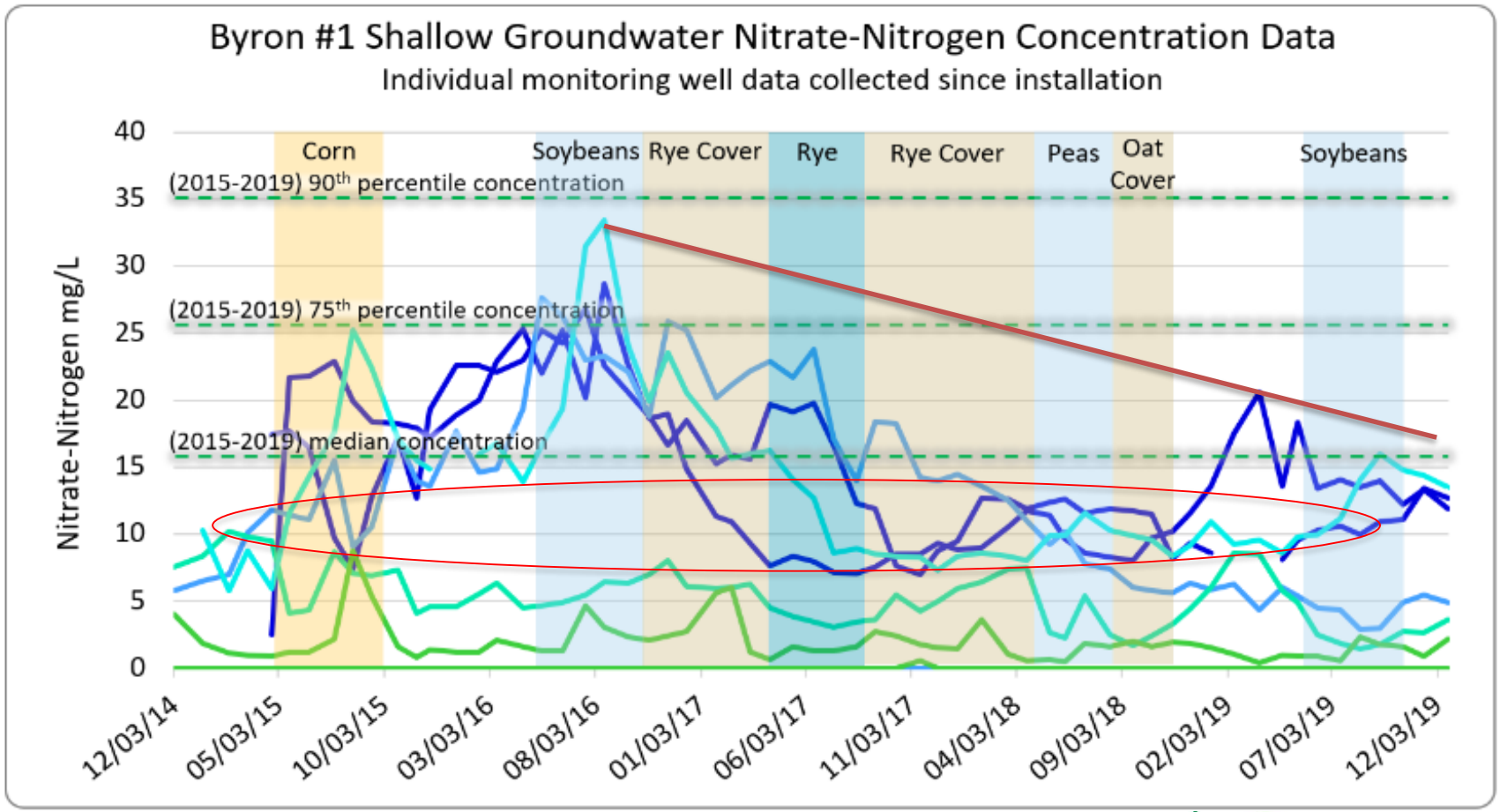

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Byron Township Project

- Hyper management to solve real world problems – one chance per calendar year.
  - Transparency, voluntary
- Aside from MDA report and staff time, all partners self-fund project.
- Field scale, farmer friendly adaptability.
- Team approach.
- Build a model for farmers to learn from.

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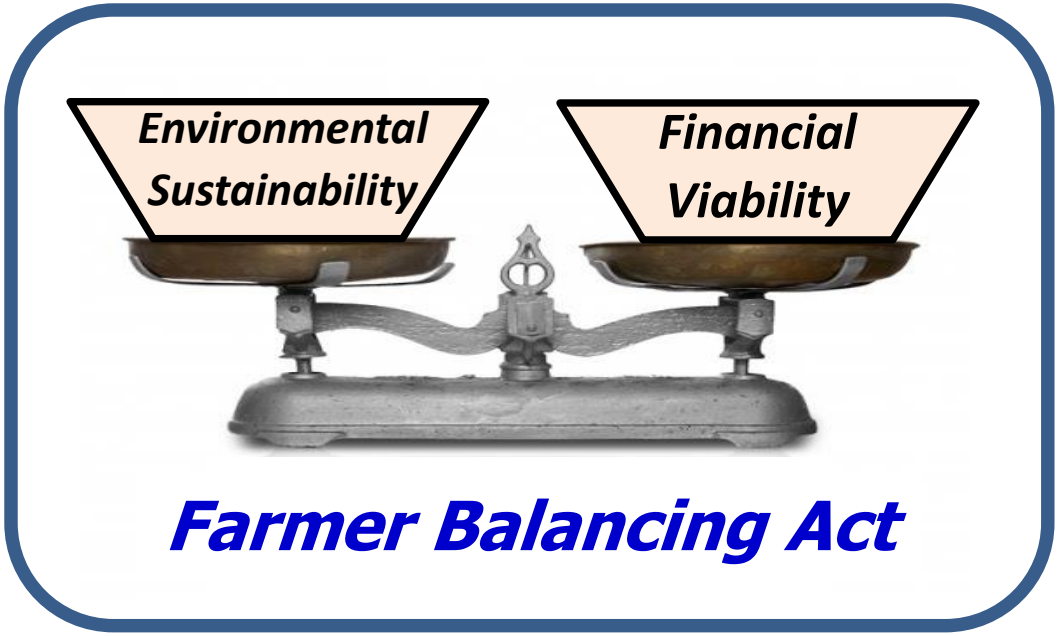
Byron Township Project

- Balance of economics with environmental sustainability.
  - Farmers can farm, environmental impact is limited.



Why does this matter?

- 600,000 acres of similar soil type in Minnesota – practices are transferable
- Navy Beans (specialty crop) – 50% of Dark Navy Beans (Chili) in the nation's store-shelves come from our region
  - #1 State Rank in Nation for Production
    - http://www.decision-innovation.com/webres/File/Infographic%20-%202020%20Economic%20Contribution%20Study%20of%20Minnesota%20Agriculture%20and%20Forestry.pdf
  - Prefer a sandy soil to grow in under irrigation
  - Cannot be grown consecutive years in same field, need for crop rotations

Why does this matter?

- Potatoes (specialty crops)
  - Major economic impact on our region
  - Minnesota has 40,000 + acres each year
    - Ranks 7th in production
      - https://downloads.usda.library.cornell.edu/usda-esmis/files/fx719m44h/f7624b72t/db78vc14v/pots0921.pdf
  - Flourish in sandy soils under irrigation
  - Cannot be grown in consecutive years – every 3rd-4th year, looking to move it longer
  - Needs farmers to rotate crops with them

Is this soil type marginal?

2020 Minnesota Agriculture & Forestry Economic Contribution Study

Cass County

Cass County contributes the following to Minnesota's economy through agriculture, agri-food, forestry, and related industries.

Jobs

Cass County agriculture and related industries supported 1,269 jobs which accounts for an estimated 8% of total jobs the county.

Crops	Livestock	Forestry	Processing and Other Agriculture
107 jobs	454 jobs	494 jobs	214 jobs

Output

Total output or sales in Cass County generated from agriculture and related industries total an estimated $161 million.

Crops	Livestock	Forestry	Processing and Other Agriculture
$7.4 million	$37.0 million	$77.9 million	$39.1 million

Value-Added

Agriculture in Cass County generated an estimated $49.7 million in total value added above the cost of inputs, which represented 5% of value-added in the study area.

Crops	Livestock	Forestry	Processing and Other Agriculture
$2.5 million	$9.4 million	$25.2 million	$12.6 million

Labor Income

There is an estimated $12.5 million in labor income supported by agriculture and related industries in the county.

Crops	Livestock	Forestry	Processing and Other Agriculture
Not significant	Not significant	$18.1 million	$7.9 million

Cass County Quick Facts

Number of Farm Operations	Average Farm Size	Market Value of Crops	Market Value of Livestock
432 farms	309 acres	$7.5 million	$19.0 million

AgriGrowth™ Growing MN Food & Agriculture™

This study was commissioned by AgriGrowth in partnership with more than two dozen Minnesota agriculture organizations. For a full list of partners, and to read the full report, please see this link: https://tinyurl.com/MN-Ag-Forestry.

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Future of Precision Irrigation

New Grant Program:

NRCS – RCPP program

– https://agcentric.org/rcpp-precision-irrigation/

Operations Team

- **Project Sponsor:** Minnesota Department of Agriculture.
- **Project Partners:** 20 Soil and Water Conservation Districts: Becker, Benton, Cass, Dakota, Douglas, East Otter Tail, Grant, Hubbard, Kandiyohi, Meeker, Morrison, Pope, Sherburne, Stearns, Stevens, Swift, Todd, Wadena, Washington and West Otter Tail.
- Central Lakes College Ag and Energy Center, AgCentric, Northern Center of Agricultural Excellence, Mille Lacs Band of Ojibwe, Irrigators Association of Minnesota, Central Minnesota Irrigators, Todd-Wadena Electric Coop, Reinke Manufacturing, RD Offutt Farms, RESPEC Consulting, University of Minnesota, Minnesota Board of Water and Soil Resources, and Minnesota Department of Health

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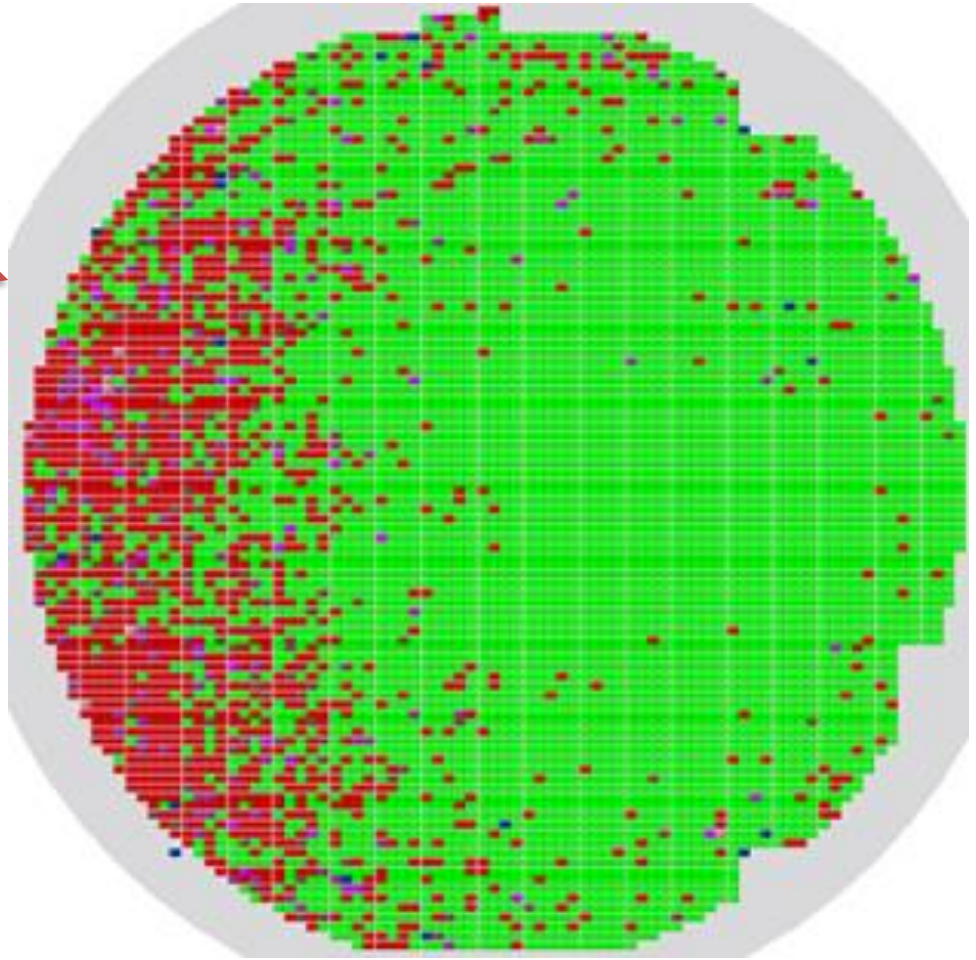
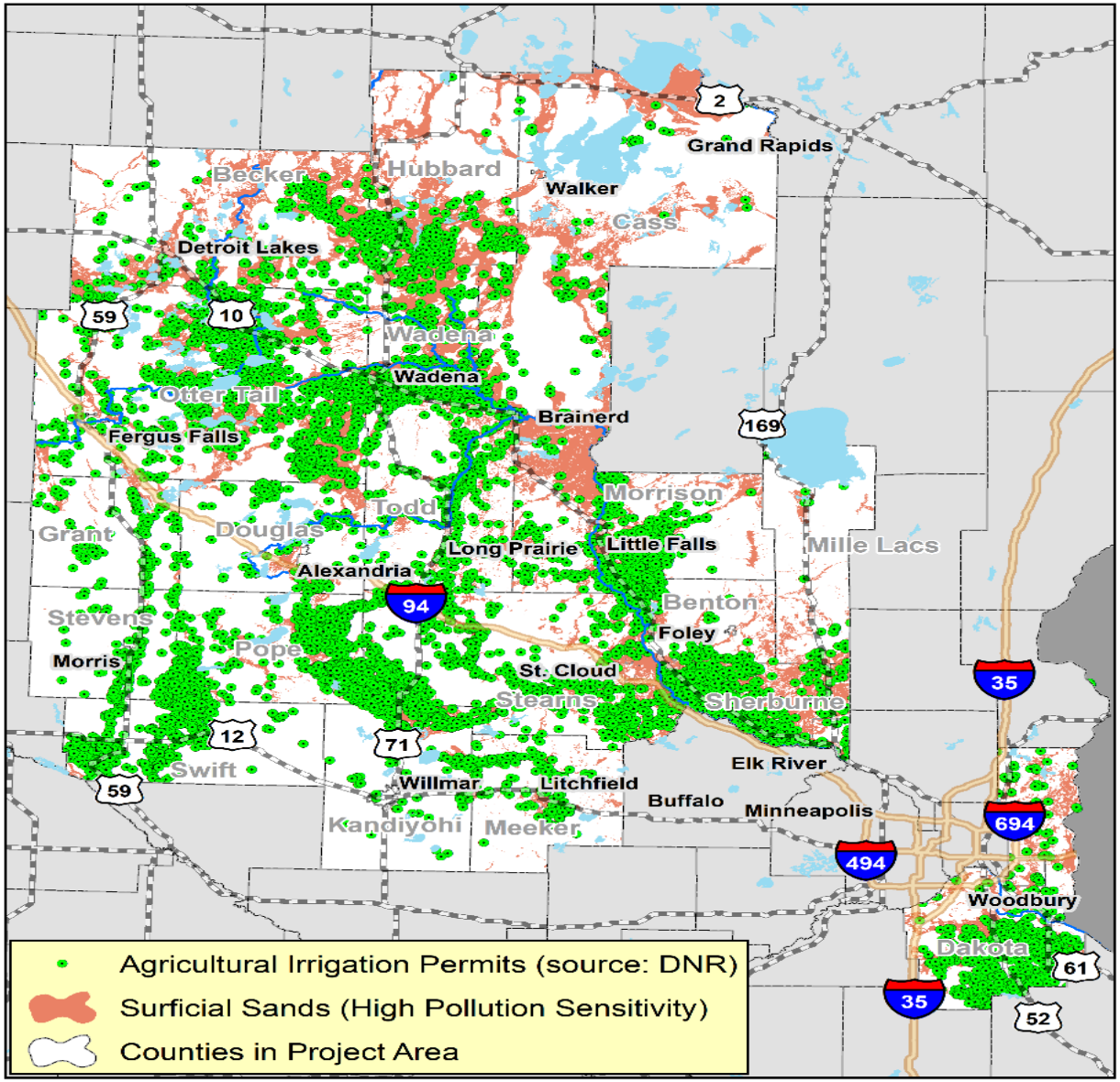
Transforming Water & Energy Use



Project Area



Summary

- Farmers irrigate to utilize soil capacity and minimize wasting crop inputs
  - Edible Beans
  - Potatoes
- Farmers desire minimal water use to get sufficient crop and grow soil quality for future crop years and future generations
  - Farmers are experienced land managers
  - Farmers are your key to continual improvement to our production systems
- Economics control the rate of adaptability of environmental practices
- New, focused effort through grant to support farmer adaption of new technologies

Why do I care?

- I farm.
  - Today, hopefully for decades to come.
    - Requires intensive soil and water management for long term sustainability.
  - I have children that appreciate agriculture and have grown roots within it's "joys".
  - I desire to have a land parcel that is better for them than when I began to manage it.

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