

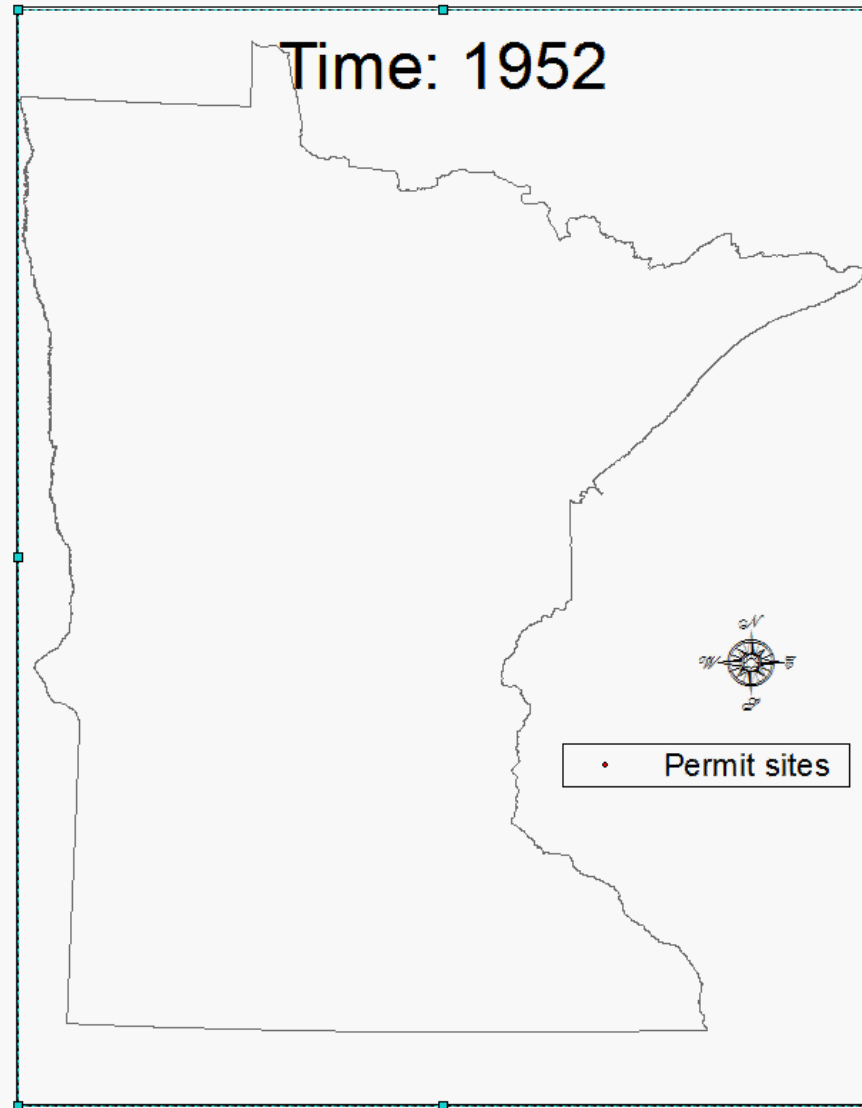


Advanced Irrigation Water Management

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INTENSIFICATION OF IRRIGATION



CROP IRRIGATION IN MINNESOTA

- High pressure and low efficiency solid-set sprinklers and traveling booms prior to late 60's
- Transition to more efficient center pivot in 70s with low pressure system adoption in 90's
- Center pivot irrigation continues to dominate due to high efficiency, lower labor and costs



| Year | Type of Irrigation as % of total irrigated crop land | | | | | |
|------|--|-----------|----------------------|-----------------|---------------|-------|
| | Center Pivot | Solid Set | Towable Center Pivot | Drip Irrigation | Traveling Gun | Other |
| 1997 | 92.64 | 0.28 | 2.22 | 0.01 | 4.46 | 0.39 |
| 2000 | 93.73 | 0.42 | 1.55 | 0.07 | 3.98 | 0.25 |
| 2003 | 93.15 | 0.22 | 1.82 | 0.02 | 4.63 | 0.17 |
| 2006 | 94.65 | 0.15 | 1.78 | 0.03 | 3.31 | 0.09 |
| 2009 | 96.29 | 0.22 | 1.14 | 0.08 | 2.07 | 0.19 |
| 2011 | 95.73 | 0.20 | 0.98 | 0.08 | 1.24 | 1.78 |

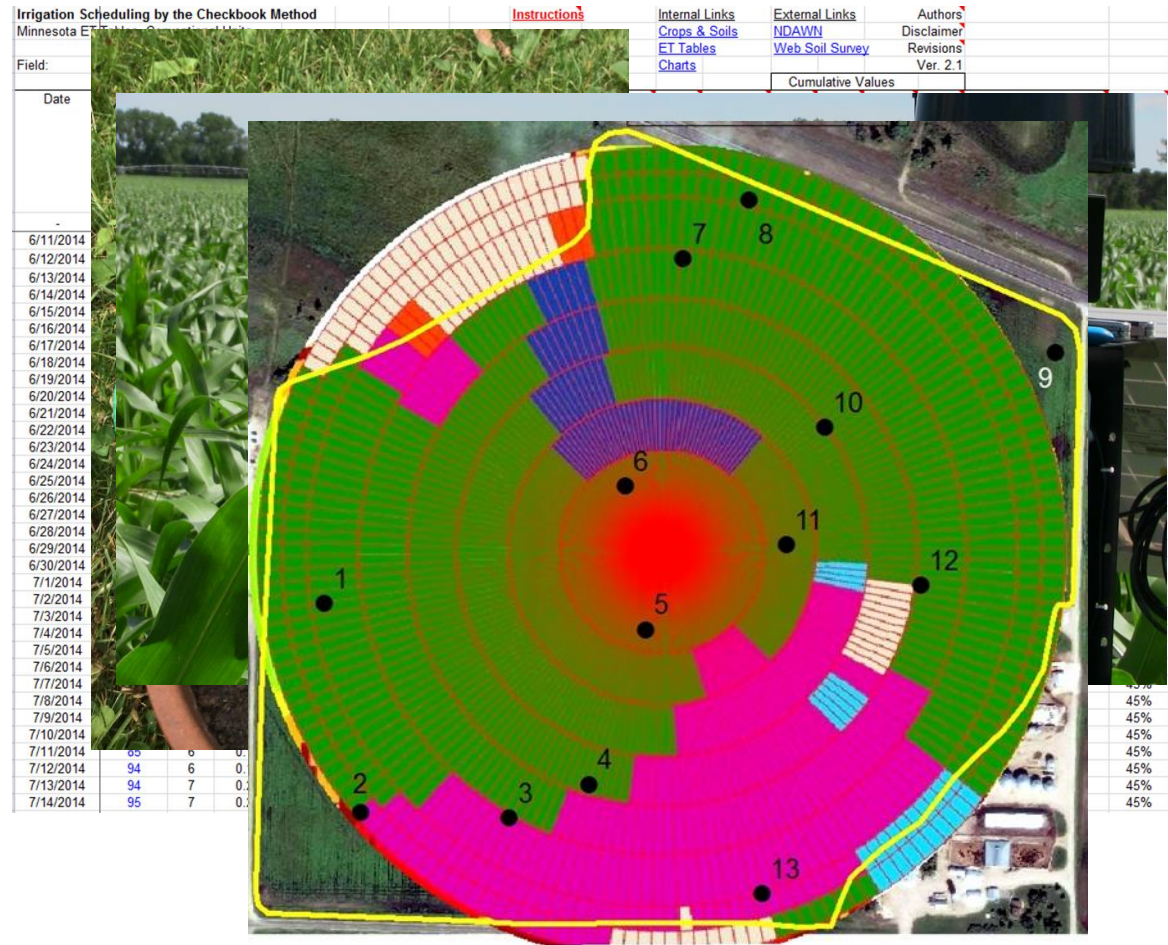
ADDRESSING NITRATE GW ISSUES

- Lousy irrigation practices will degrade groundwater.
- Concept: No net leaching from irrigation
- IWM tools to help growers better “mine” stored root zone water
- Never completely refill the soil profile

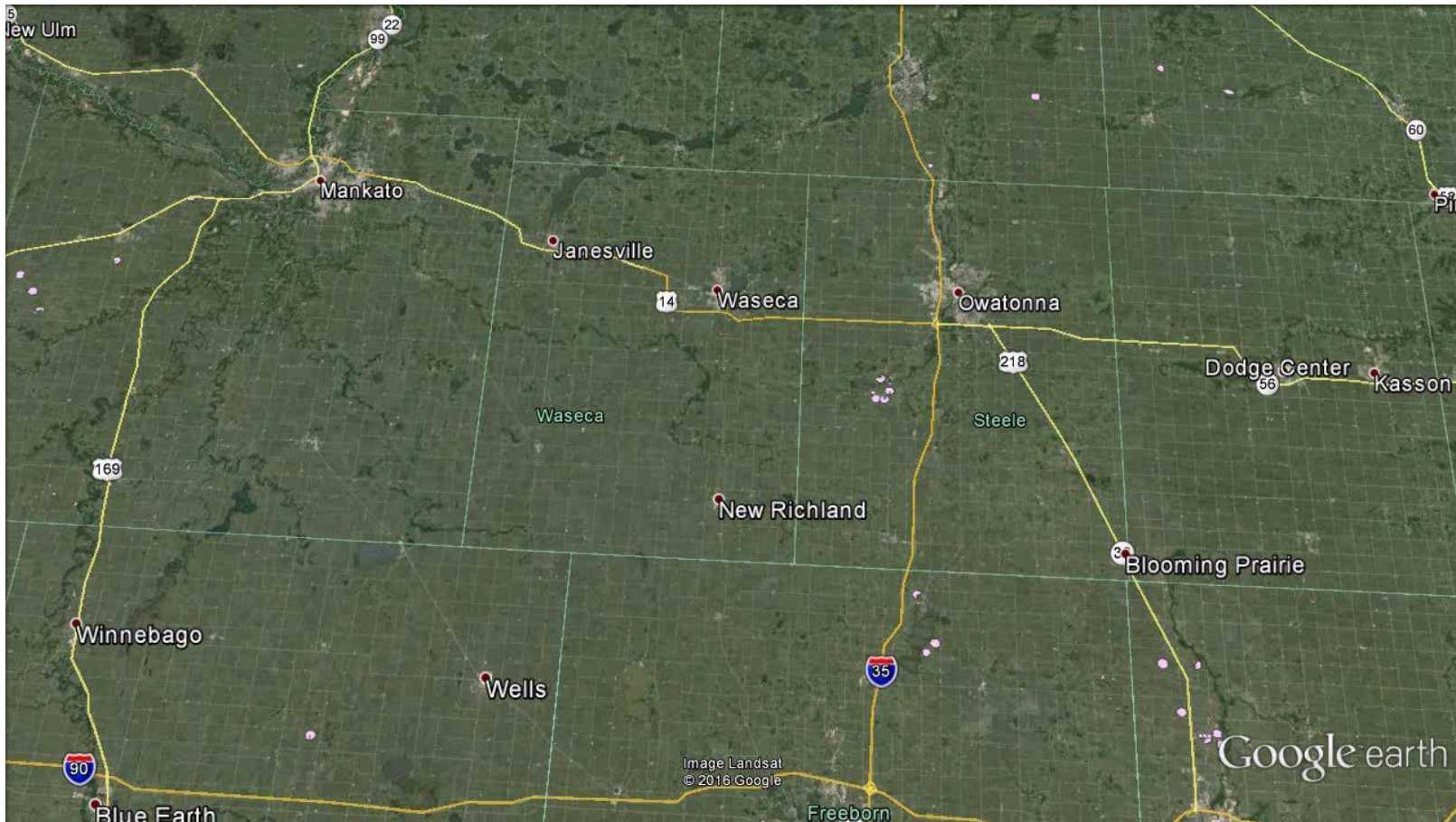


IRRIGATION WATER MANAGEMENT

- Water Balance
- Moisture sensors
- Telemetry
- Variable Rate Irrigation (VRI)

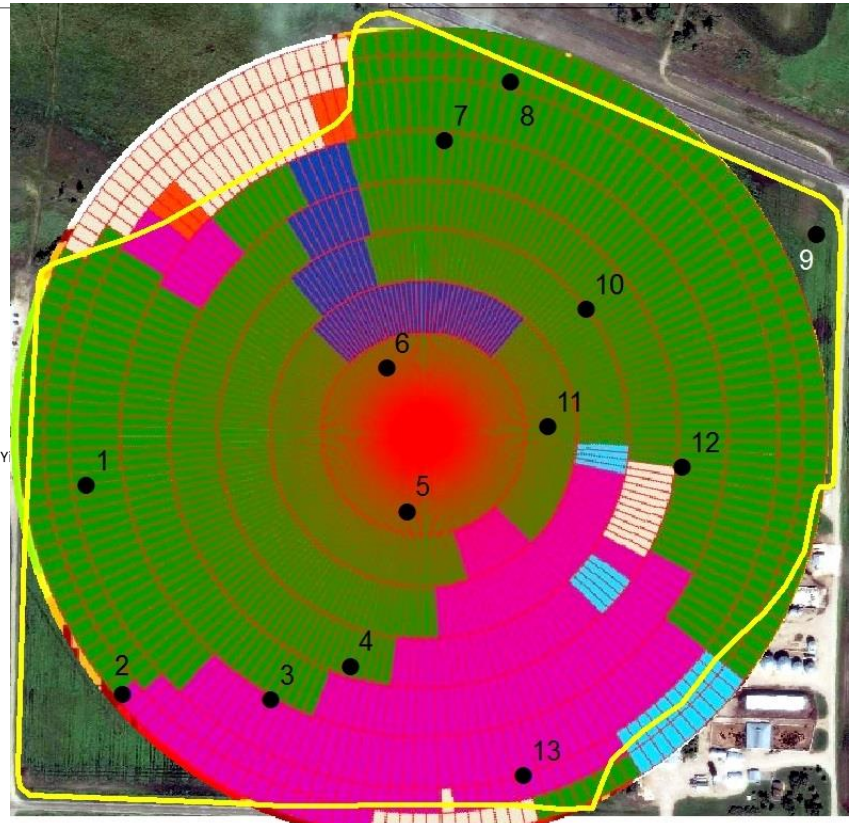
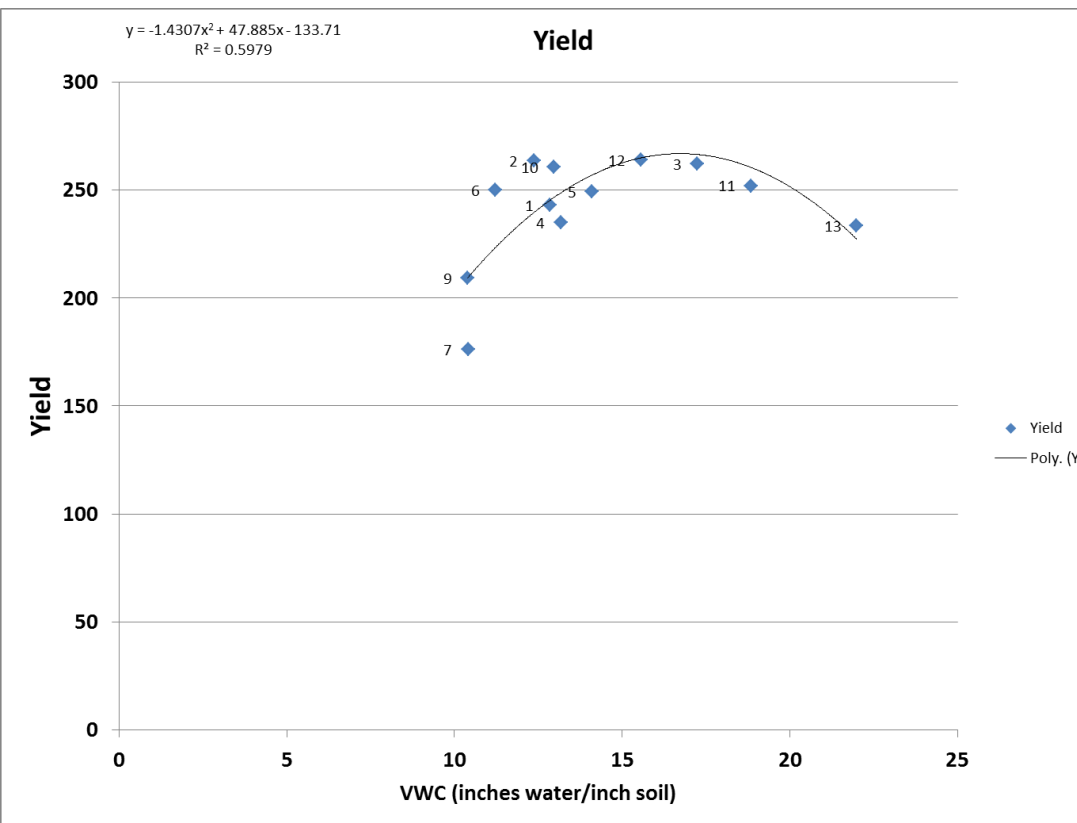


CURRENT TOOL DEVELOPMENT



- Take data from agencies and use it to make it into data that can be used
- Survey of most heavily irrigated soils
- Base layer for LCCMR/Benton Co Irrigation Scheduling tool

VRI, SOIL WATER, AND YIELD



PLANS FOR 2016

Ongoing Activities

- Irrigation BMP development
- Soil Sensor testing demos
- Hands on training for SWCDs
- Small plot water stress studies to test irrigation water management tools

Needs

- Impact of water stress on crop yield
- how water is held in soil pores and the volume of space in soil pores
- Measuring Evapotranspiration of crops besides Corn and Beans



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MAKING A DIFFERENCE IN MINNESOTA: ENVIRONMENT + FOOD & AGRICULTURE + COMMUNITIES + FAMILIES + YOUTH

