Farmer Innovation: Farming for Today and Tomorrow

By Grant Strom

Co-Owner/Operator Strom Farms

Dahinda, Illinois

Overview

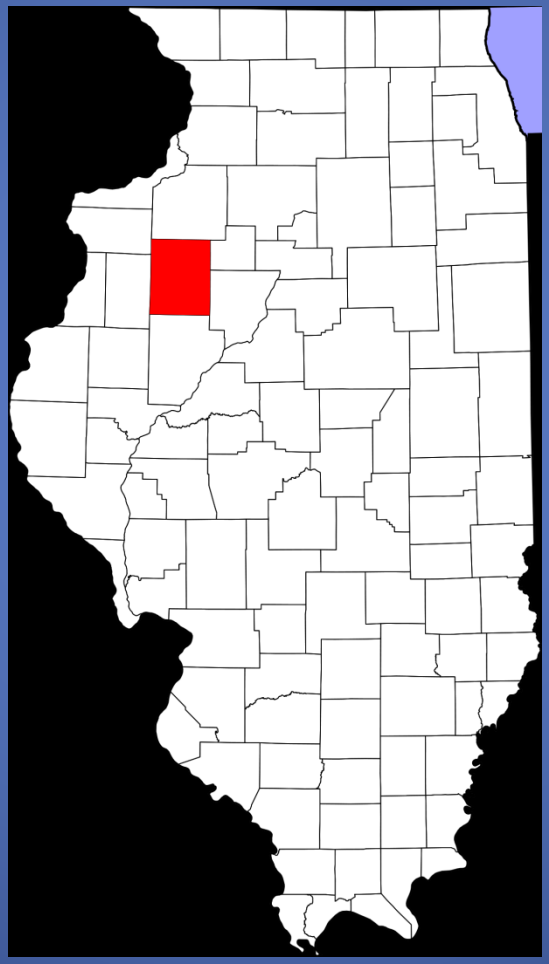
- Strom Farms
- Why 4R's
- Evaluating Farms
- Examples of Success
- Other Farmer's View/Barriers
- What we need from the fertilizer industry

Credibility??

- B.S. Farm and Financial Management, University of Illinois, 2003
- Illinois Agriculture Leadership Foundation Class of 2010
- Knox County Farm Bureau President
- 14 yr 4-H Leader
- 2017 AFBF Young Farmer & Rancher Achievement Award, National Winner
- Multi-time district corn and soybean yield champion
- 2017 4R Advocate, The Fertilizer Institute
- Wife, Kristen 10 years, 3 kids Gavin (7), Layla (6), Georgia (15 mo)
- 2018 Boston Marathon Qualifier

Strom Farms

Knox
County
Illinois



Strom Farms

- 6,000 acres of Corn & Soybeans
  - 3,400 acres of Corn
  - 2,600 acres of Soybeans
- 80% of fields rotated and are no-till/conservation till
- Farms are highly variable in soil type, slope, and size
- Creates need for efficiency=adoption of technology

4R Nutrient Strategy

- Right Source
  - Match fertilizer to crop type needs
- Right Rate
  - Matches amount of fertilizer type crop needs
- Right Time
  - Make nutrients available when crops need them.
- Right Place
  - Keep nutrients where crops can use them

Source: The Fertilizer Institute, www.nutrientstewardship.com

Why 4R's for Strom Farms

- Diverse production needs
  - High variability in field conditions
  - Sensitive soils
  - Floodable and high risk acres
- Needed to increase fertilizer efficiency—create a sustainable system for future generations.
- Talk of increased regulations:
  - Gulf Hypoxia
  - Lake Erie
  - Chesapeake Bay

Changes with the 4R's

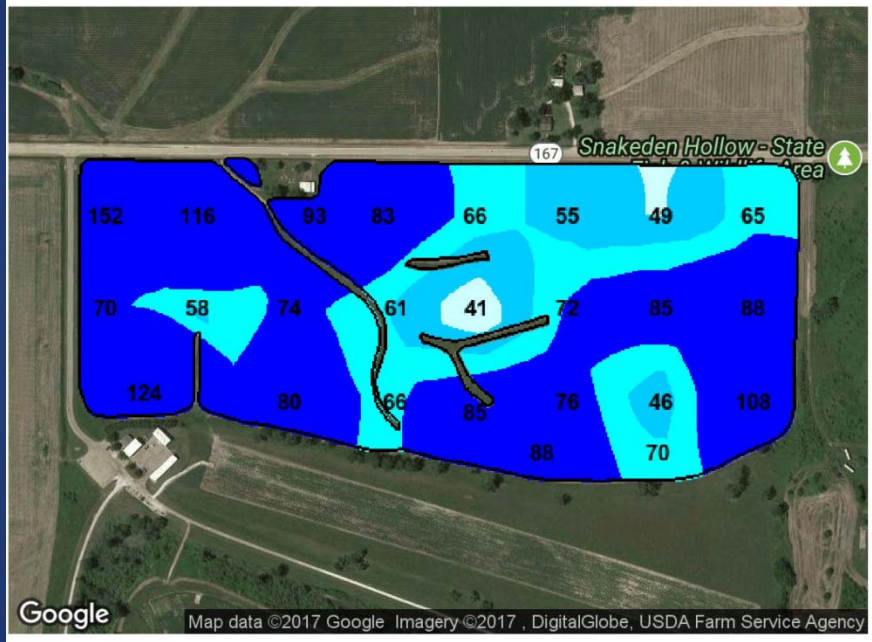
- Have used VRT for P and K needs for many years
  - Traditionally 2 year applications
  - Changed to 1 year applications
- Have increased focus on Nitrogen in recent years
  - All Spring or in-season applications now
  - Experimenting with Variable Rate N
- **Economics:** Increased fertilizer efficiency with less lbs/bushel produced=savings$$$.

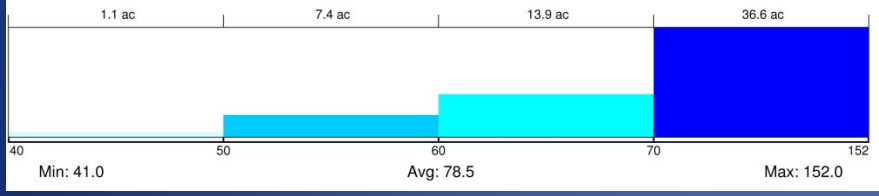
Different Field=Different Recipe

- Variation in soil type, slope, fertility, residue management, rotation, and capability
- Can't change a farm in one year.
- Soil testing: is an important key to figuring out a field's potential and limiting factors.
  - Create a balanced field=Soil PH
- Reduction in tillage has increased our success.

Sieboldt Farm

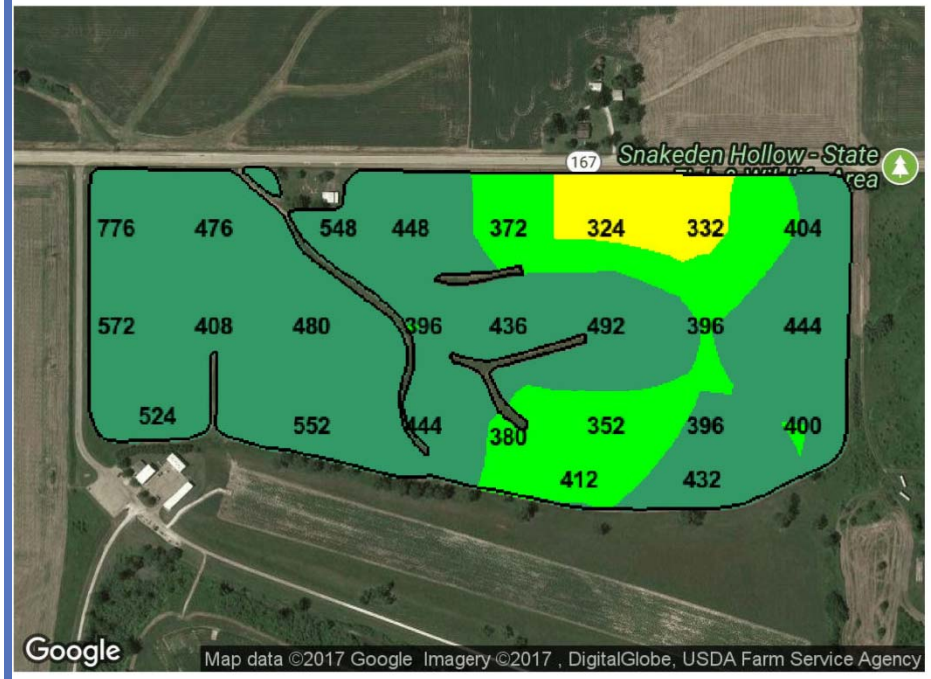
Phosphorus (lb/ac)

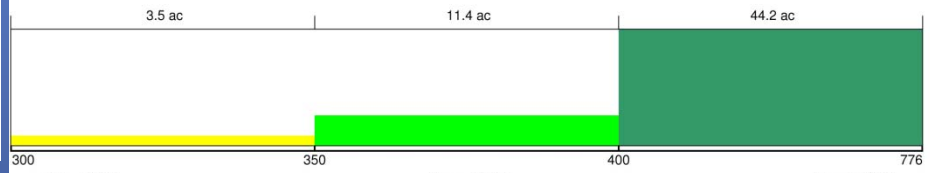




Min: 41.0 Avg: 78.5 Max: 152.0

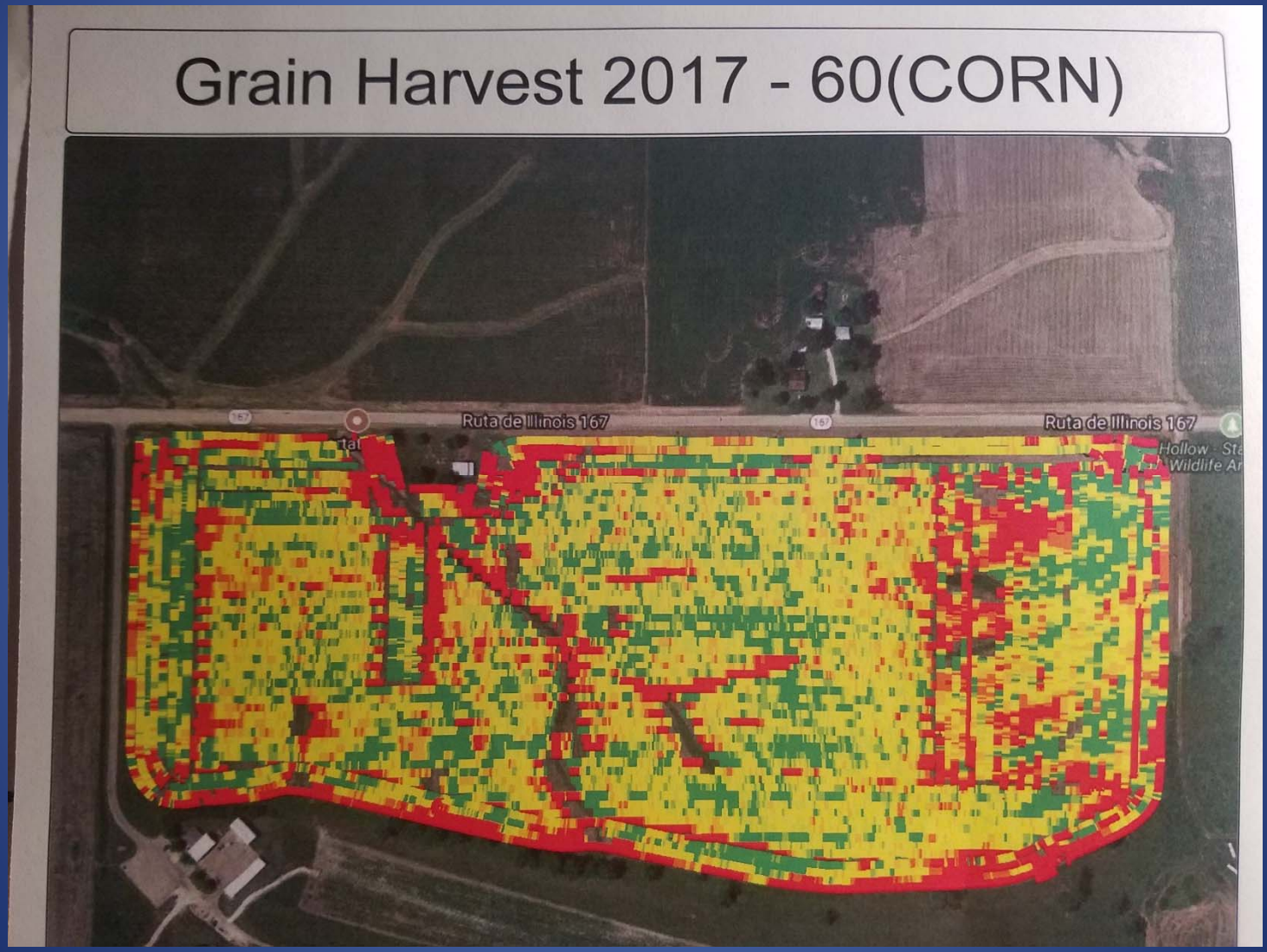
Potassium (lb/ac)





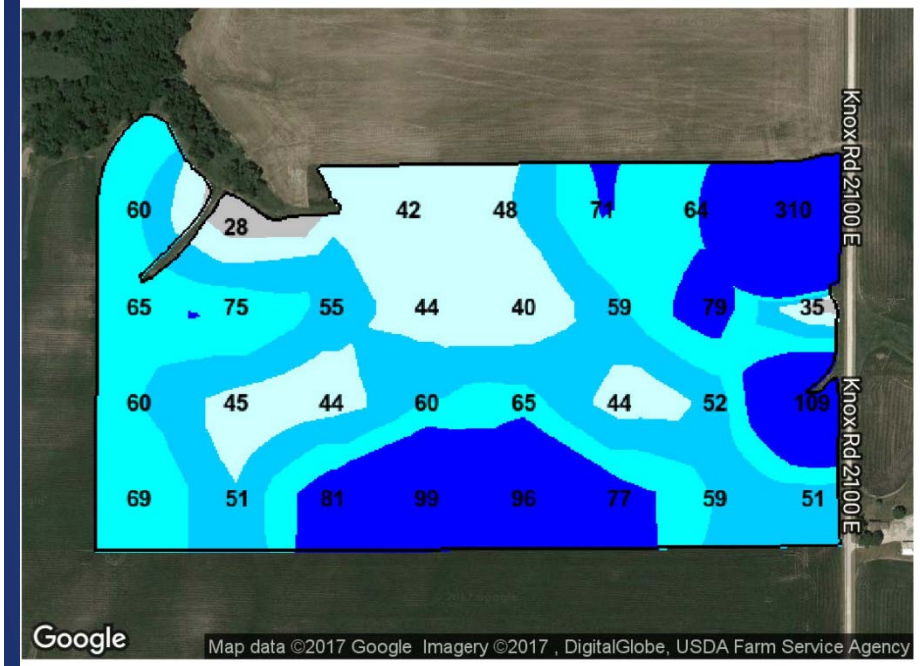
Min: 324.0 Avg: 446.1 Max: 776.0

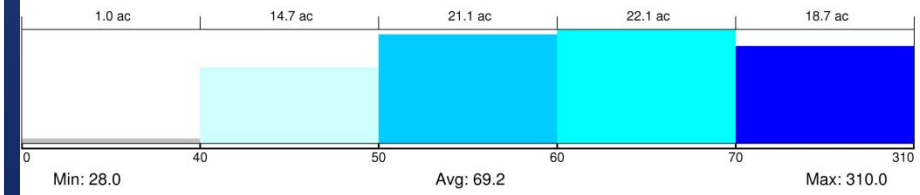
Sieboldt Farm



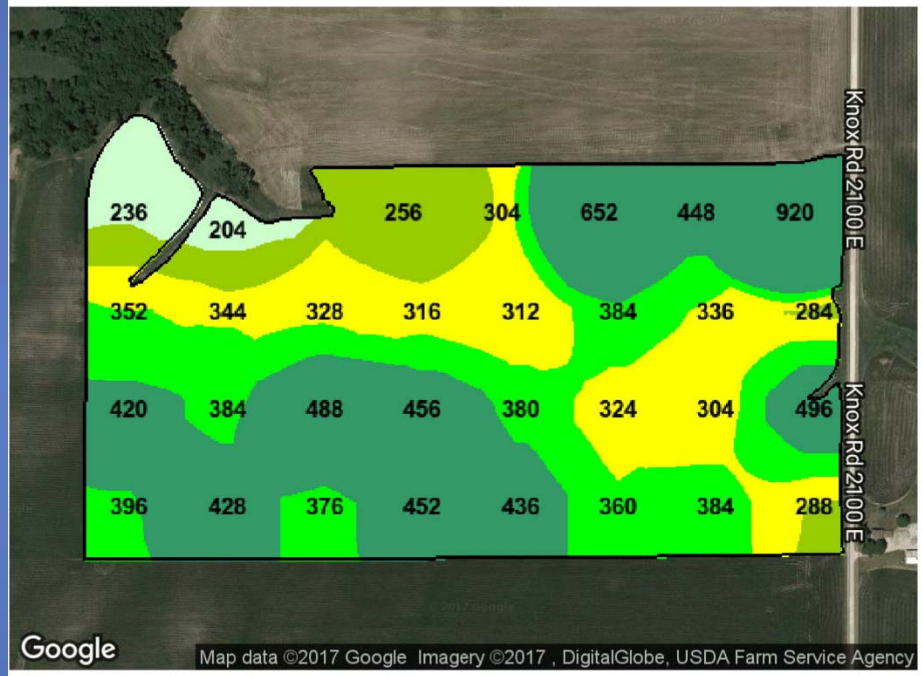
CMCL East 80

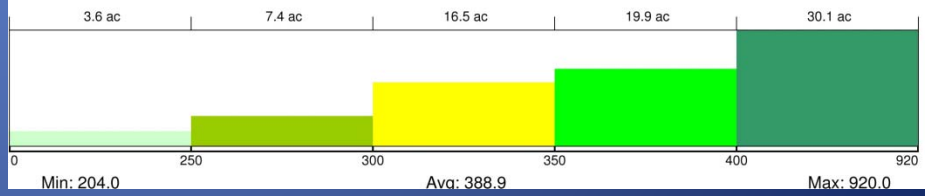
Phosphorus (lb/ac)



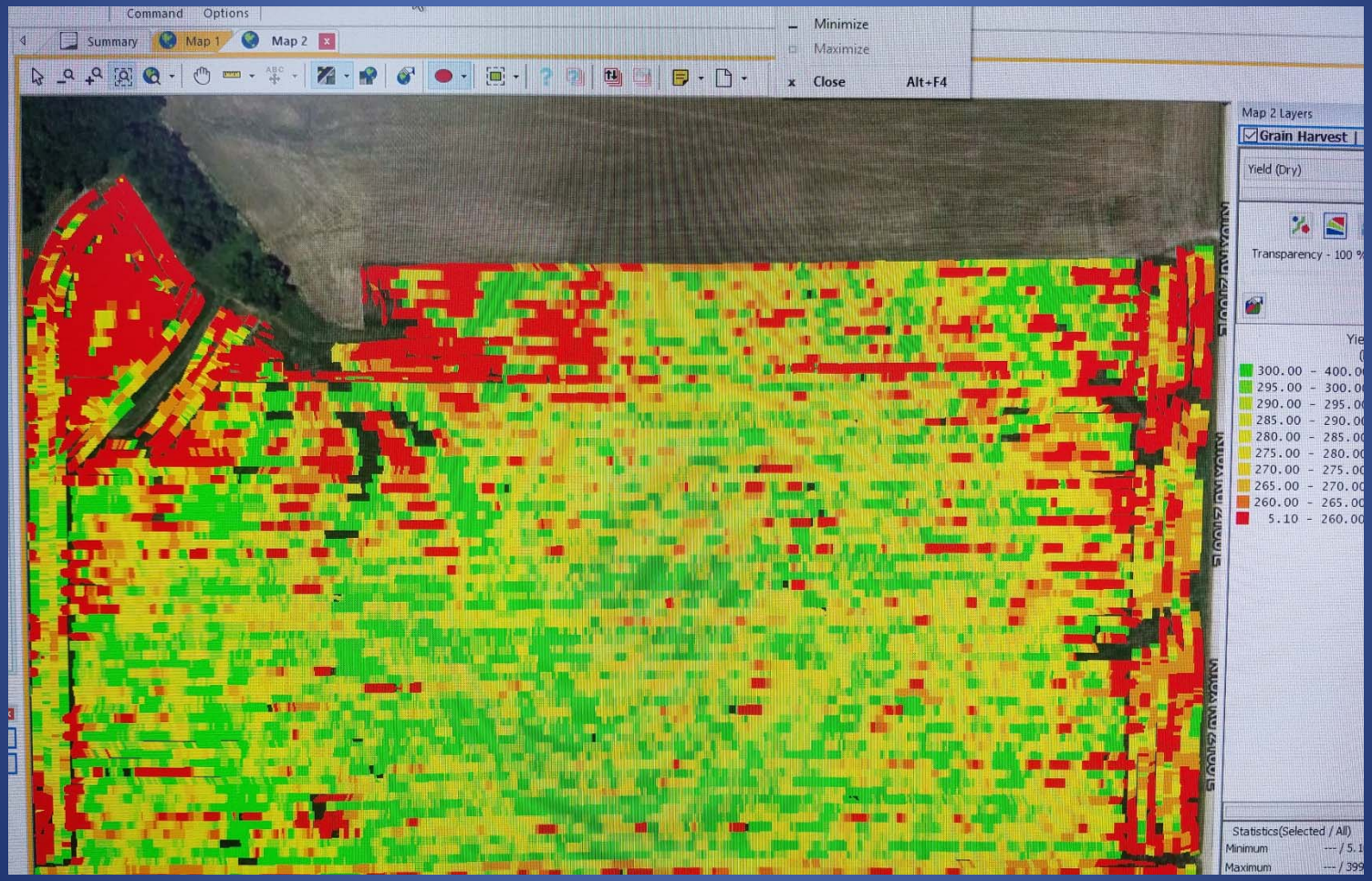


Potassium (lb/ac)





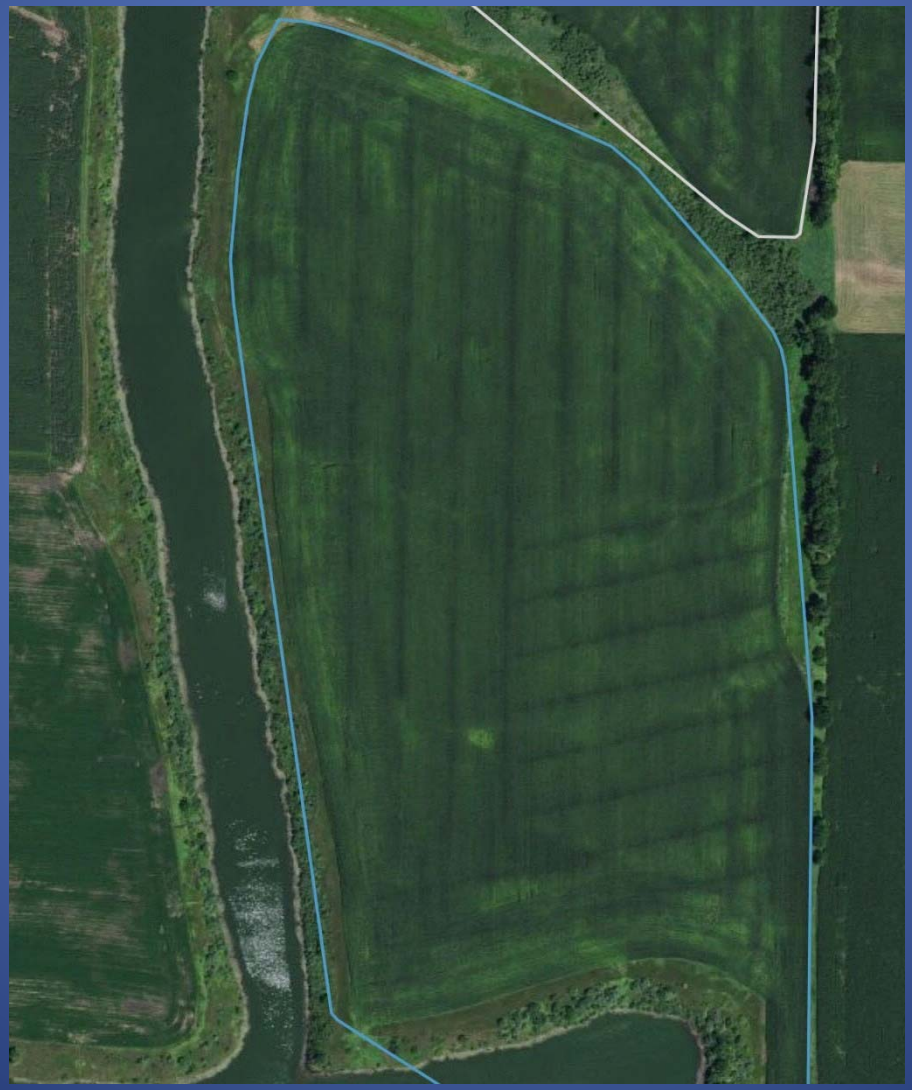
CMCL East 80


Command
Options
Summary
Map 1
Map 2
Minimize
Maximize
Close
Alt+F4
Map 2 Layers
Grain Harvest
Yield (Dry)
Transparency - 100 %
300.00 - 400.00
295.00 - 300.00
290.00 - 295.00
285.00 - 290.00
280.00 - 285.00
275.00 - 280.00
270.00 - 275.00
265.00 - 270.00
260.00 - 265.00
5.10 - 260.00
Statistics(Selected / All)
Minimum
Maximum

Jack Bond Farms

- Reclaim farms
  - Land was strip-mined in 70's
  - Leveled and top soil replaced
  - 6-12 inches of top soil then non-virgin layers
  - 2" Rain=flood (requires field tile); one week without=drought
- Continued poor performance led to new thinking.
- My ah-ha moment…

Jack Bond Farms



Jack Bond Farms

Year	Nitrogen	Yield
2014	150 Units Fall AA 45 Units Weed & Feed	151.7 bu/A
2015	150 Units Spring AA 45 Units UAN Weed & Feed	185.1 bu/A
2016	100 Units Spring AA 45 Units Weed & Feed 45 Units UAN Y-Drop (V10)	194.4 bu/A
2017	35 Units Weed & Feed 46 Units Urea (V5) 46 Units Urea (V10) 46 Units Urea (VT)	219.1 bu/A

Whole Farm Nitrogen Use

Year	Corn Yield	Nitrogen Apps	Nitrogen Use Rate
2014	229.5 bu/A	150 Units AA Fall/Spring 45/80 Units UAN Weed & Feed 45 units UAN Drops on 1000 acres	0.941 lbs N/Bu
2015	219.5 bu/A	100/150 Units Spring AA 45/80 Units Weed & Feed 46 Units Urea Aerial (V10)	0.923 lbs N/Bu
2016	245.9 bu/A	100/150 Units Spring AA 35/80 Units Weed & Feed 45 Units UAN Y-Drop (V10)	.796 lbs N/Bu
2017	255.3 bu/A	100/150 Units Spring/Sidedress AA 35/80 Units Weed & Feed 45 Units UAN Y-Drop (V10)	.765 lbs N/Bu

Lessons From 4R's

- You will spend more on equipment and application technology
- You will use less fertilizer per bushel produced
  - Systems approach
    - Must have proper equipment technology
    - Strong genetic selections
    - Healthy and balanced soils
    - Place fertilizer using the 4R strategy

New U of I Recs

- New University of Illinois Phosphorus and Potash recommendations
  - Corn
    - .37 lbs of P per bushel (down 15%)
    - .24 lbs of K per bushel (down 15%)
  - Soybeans
    - .75 lbs of P per bushel (down 10%)
    - 1.17 lbs of K per bushel (down 12%)

What are the barriers?

- Equipment costs—very difficult for smaller or lower capital operations
- Time consumption—I spend DAYS with my agronomists figuring out products and strategies.
- Farming/fertilizer industry are not yet equipped for a full scale implementation
  - Example Anhydrous Ammonia

How do we convince others?

- What speaks to farmers?
  - Big Yields
  - Saving/Making Money
- These are both achievable with the 4R Nutrient Strategy
- Farmers are business owners: They care about the environment—but they have to be economically viable.

What Can Fertilizer Industry Do?

- New product formulations=more flexibility
  - Helps farmers better create field specific recipes
  - Helps to limit overuse of product
- More Triple
  - MAP and DAP contain Nitrogen—not stabilized
  - Majority surface applied
- More research in the area of Nitrogen
  - Use rates, loss models, stabilizers

What Do Farmers Want?

- More diversity in product selection.
  - Create new blends/formulations of fertilizers
    - MES and MESZ (Mosaic)
    - Aspire (Mosaic)
  - New micro-nutrient products—that are cost effective
    - WolfTrax (Compass Minerals)
- More value for our dollar
  - Seed industry vs Fertilizer Industry

Next Steps for Improvement

- Sampling
  - More soil analysis/better zones
  - Tissue Sampling
- Monitoring Systems/Services
  - Climate, Encirca, Farmer's Edge etc.
- Newer and better imaging systems/services
  - Instant images in our future??

Why 4R for Me

- Economics
  - Much less expense per bushel produced
  - Less product on un-needed areas
- Environment
  - Right thing to do
  - Lead to less regulations?
- Need a sustainable system
  - Public appeal
  - Strong business model

Farmer Perspective

1. A consumer of Ag Inputs…or
2. A manufacturer of crops and grain?

Grain Farming is unique…we buy finished/value added products and technology to produce a raw consumer product. We have to spend a lot of time deciding value that is often difficult to quantify.

Final Thoughts

- The 4R Nutrient Management system is absolutely a path to sustainability
  - Spend more effort on displaying the economics
- Every field is different and must be treated as such
- Find ways to help farmers overcome the hurdles
  - Equipment cost, data overload, time consumption