

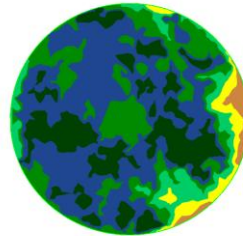
Precision Ag Perspectives of a Research, Consultant, and Farmer

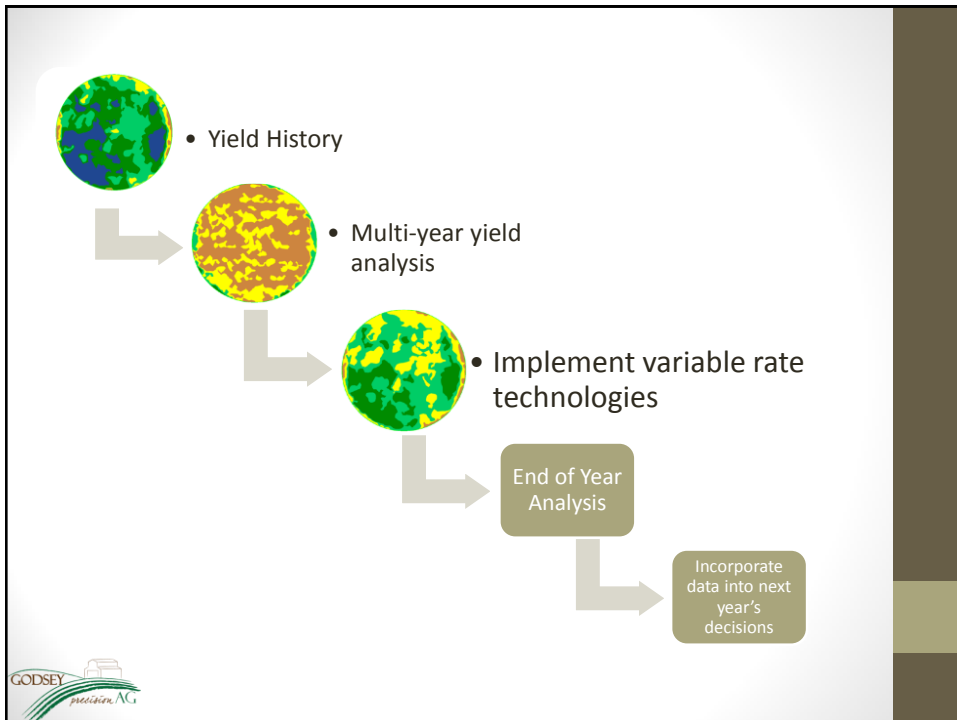
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Farmer Perspective

- What is working:
 - Yield based management zones for seeding and N fertilizer
 - Soil moisture monitoring
- More research needed:
 - Variable Rate Irrigation
 - UAV
- What we haven't had the need to do:
 - Collect EC data





Nitrogen Management

- Example Basic Program
 - 20-40 lb N/ac as starter
 - Side-dress: vary rates 20 to 100 lb N/ac
 - Sprinkler: 100 lb N/ac
- Figure 0.8 to 1.0 lb N/bushel of corn
- Averaged close to \$10/ac savings in N fertilizer
 - Savings comes from low yielding areas
 - Yield upside is in high yielding areas of the field

End of Year Analysis

Table 1. Input cost and realized savings for 2010-2014.

Input	Minimum Rate	Maximum Rate	Average Rate	Savings over uniform rate
----- per acre -----				
Seed	27,000	34,000	31,299	\$1.75 [†]
Nitrogen (lb/N)	30	100	67	\$11.07 [‡]
Total Input Savings				\$12.82

\$6,919 on 125 ac field over a 5 year period



N, S, and Cl Management for Wheat

- Soil sampling in late-summer/early fall: 0-6" depth (grid, zone, or composite)
- Soil sampling collected in late winter from 0-24" depth to determine profile N, S, and Cl prior to top-dress
- Season long N monitoring using N-rich strips
- UAV or Sensor for Variable Rate Application



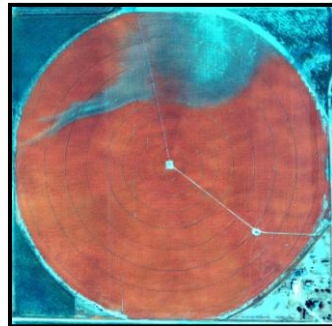


- End of Year Analysis:
- Over a 2-year period on 5,000 ac, under drastically different yield conditions, Producer saved an average of \$6-8/acre on nitrogen by accurately assessing in-season N needs of the crop.
- **\$35,000 saved in a two year period.**



More Research Needed

- UAV
 - Diagnostic is a no brainer
- Variable Rate Irrigation
 - Technology is available but soil moisture monitoring is limitation
 - Can we accurately define zones?



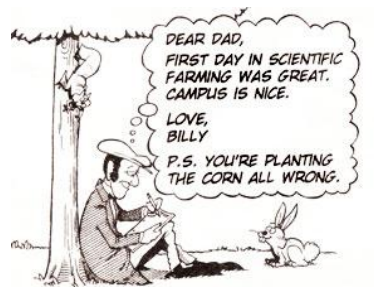
Summary from the Farmer Side

- Hold-up's
 - Local Support
- Proven Items
 - VR fertilizer and seed
 - Soil sampling



Researcher Perspective

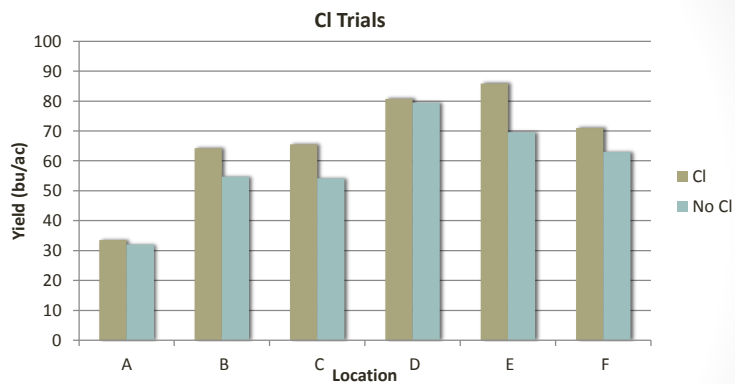
- Divergence between University and Industry
 - Lack of funding
 - Turnover of faculty members
- Progressive farmers have surpassed what is happening at University in regards to Precision Ag
- Lack of unbiased research



Why has on-farm research become so important?

- Shrinking budgets at Land-grant Universities
- Not enough unbiased data
- We as an industry have to document economical advantages for long-term sustainability

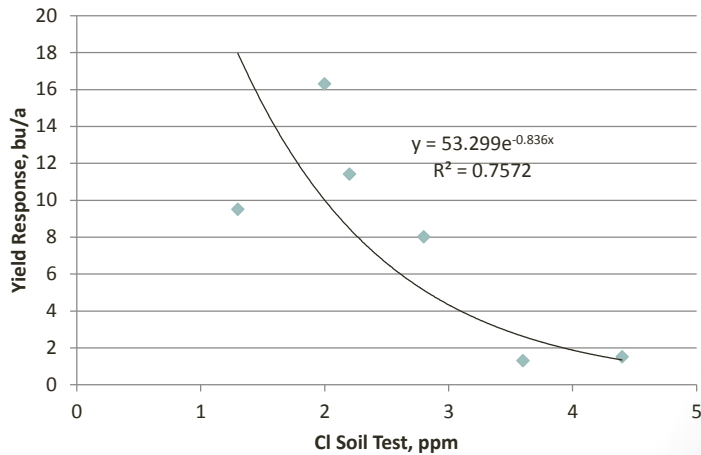
CI Response in Wheat



- Averaged across locations, CI application increased wheat grain yield 8.0 bu/ac. Increase in yield ranged from 1 bu/ac to 16.3 bu/ac.
- \$88,000 in additional revenue if CI had been applied to 2,000 ac in 2014.



Cl Soil Test Level vs Yield



Consultant Perspective

- Focused around the three main input expenses: seed, fertilizer, and water.
- Every producer is at a different point in adoption so cookie cutter approaches do not work in lot of cases. Each plan has to be made individually to accomplish goals.
- Development of precision ag technologies like prescriptions should be a continuous dialogue between producers and consultants.
- Efficiency!!!!!!



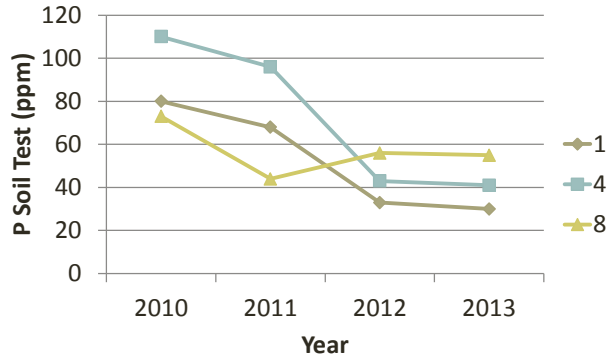
Consultant Perspective

- Things that are a delaying adoption:
 - No independent thought process
 - Everybody is trying to do it
 - Every situation is unique, one size does not fit all
 - Focus is on saving money and not efficiency



Other Thoughts

- Soil Sampling
 - It is easy to do a crappy job and hard to do a good job
 - Trends are important

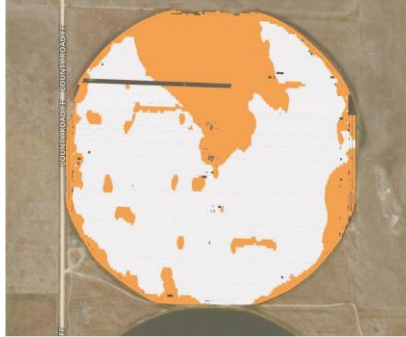


Tools in Toolbox

- Software
 - SST
 - SMS
 - AgVeritas

Hybrid: P1266AM - 5/30/2014 Spatial Effects: Same as this year
 Management Zones: Same as this year Harvest: 10/07/2014; Average
 Soil Types: Same as this year Fungicide: *ZenLeahg*
 Crop Price: \$4

Crop Price: \$4 Aproach - 7/15/2014 at \$15 / ac vs None - 7/15/2014 at \$0 / ac



Summary

- You have to figure things out on your own!
- Utilization and placement of check strips/plots.
- Quantify at the end of the year.
- Surround yourself with a trusted group



Thank You

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