

Nutrient Management Planning The Agricultural Side of End Use

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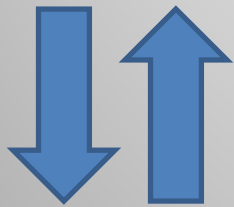
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Who is the Customer?

- Municipality



- Contract Applicator



- Farmer



So Why should a Farmer use Bio-Solids?

- Low Cost Nutrient Source
- Adds Organic Matter
- Adds Micro-nutrients
- The Magic of Organics



So Why should a Farmer **Not** use Bio-Solids?

- Bio-solids cost/nutrient ratio is too high
- Compaction from application equipment
 - Requires expensive tillage
 - Long term damage to soil structure (lower yields)
- Miss-application (missed strips, wrong rate, plugged knives, etc.)



So Why should a Farmer **Not** use Bio-Solids?

- Odor issues and neighbor complaints
- Unable to manage the system (application, crop rotation, tillage)
- Inefficient use of technologies (unable to VR apply and map)



Cost of Fertilizer Inputs to Farmers

Nutrient	2008	2009
Nitrogen (165 lbs./ac. act. N)	\$157.00	\$50.00
Phosphorus (60 lbs./ac. P₂O₅)	\$ 63.50	\$21.50
Potassium (50 lbs./ac. K₂O)	<u>\$ 37.00</u>	<u>\$22.50</u>
Total:	\$257.50	\$94.00



True Cost of Bio-solids

- Bio-solids Assets (Nitrogen, P₂O₅, OM, & Micros)
- Minus the Bio-Solids liabilities (compaction, misapplication, odors, headaches of dealing with a waste product)
- **Equals the true value of bio-solids to the farmer.**



Cost of Production Corn & Soybeans

<u>Item</u>	<u>Corn Cost</u>	<u>Soy. Cost</u>
Equipment	\$ 60.00	\$ 45.00
labor	\$ 3.00	\$ 3.00
Drying	\$ 30.00	\$ -
Storage	\$ 20.00	\$ 7.00
Dues- Subscriptions	\$ 5.00	\$ 5.00
Fert., Lime	\$ 100.00	\$ 35.00
Freight	\$ 16.00	\$ 5.50
Fuel	\$ 10.00	\$ 8.00
Crop Ins.	\$ 35.00	\$ 17.00
Other Ins.	\$ 8.00	\$ 8.00
Interest	\$ 23.00	\$ 20.00
Land	\$ 160.00	\$ 160.00
Pesticides	\$ 27.00	\$ 21.00
Repairs	\$ 13.00	\$ 13.00
Seed	\$ 78.00	\$ 46.00
Utilities	\$ 8.00	\$ 8.00
Total:	\$ 596.00	\$ 401.50
Cost/Bu. @ 160 Bu./ac.	\$ 3.73	
Cost/Bu. @ 50 Bu./ac.		\$ 8.03

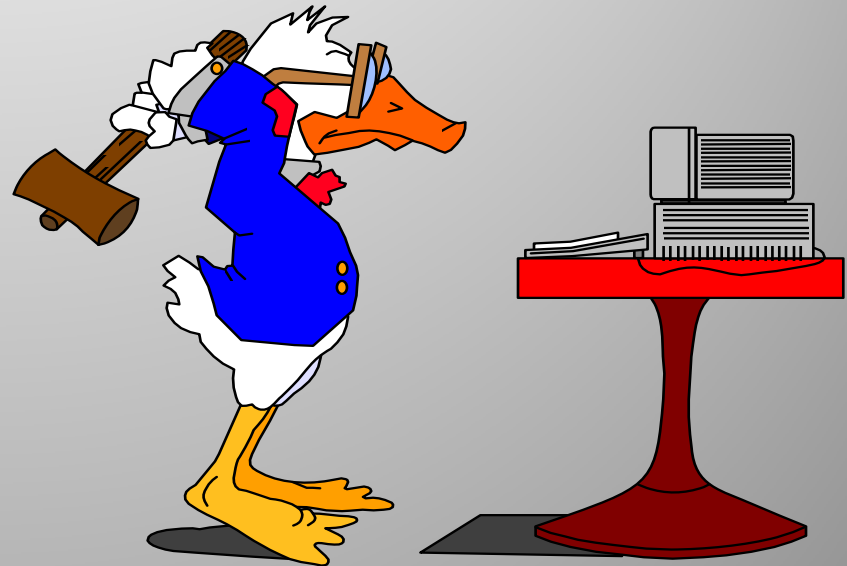


Corn – Profitability for 2010

Price/Yield Matrix @\$480.00 Cost of Production										
	Yield- Bu/ac									
Price	750	900	1050	1200	1350	1500	1650	1800	1950	2100
\$6.00	\$ (30.00)	\$ 60.00	\$ 150.00	\$ 240.00	\$ 330.00	\$ 420.00	\$ 510.00	\$ 600.00	\$ 690.00	\$ 780.00
\$5.50	\$ (67.50)	\$ 15.00	\$ 97.50	\$ 180.00	\$ 262.50	\$ 345.00	\$ 427.50	\$ 510.00	\$ 592.50	\$ 675.00
\$5.00	\$ (105.00)	\$ (30.00)	\$ 45.00	\$ 120.00	\$ 195.00	\$ 270.00	\$ 345.00	\$ 420.00	\$ 495.00	\$ 570.00
\$4.50	\$ (142.50)	\$ (75.00)	\$ (7.50)	\$ 60.00	\$ 127.50	\$ 195.00	\$ 262.50	\$ 330.00	\$ 397.50	\$ 465.00
\$4.00	\$ (180.00)	\$ (120.00)	\$ (60.00)	\$ -	\$ 60.00	\$ 120.00	\$ 180.00	\$ 240.00	\$ 300.00	\$ 360.00
\$3.50	\$ (217.50)	\$ (165.00)	\$ (112.50)	\$ (60.00)	\$ (7.50)	\$ 45.00	\$ 97.50	\$ 150.00	\$ 202.50	\$ 255.00
\$3.00	\$ (255.00)	\$ (210.00)	\$ (165.00)	\$ (120.00)	\$ (75.00)	\$ (30.00)	\$ 15.00	\$ 60.00	\$ 105.00	\$ 150.00
\$2.50	\$ (292.50)	\$ (255.00)	\$ (217.50)	\$ (180.00)	\$ (142.50)	\$ (105.00)	\$ (67.50)	\$ (30.00)	\$ 7.50	\$ 45.00
\$2.00	\$ (330.00)	\$ (300.00)	\$ (270.00)	\$ (240.00)	\$ (210.00)	\$ (180.00)	\$ (150.00)	\$ (120.00)	\$ (90.00)	\$ (60.00)

Components of Precision Ag

- Data Collection
- Data Management
- Action
- Results Analysis



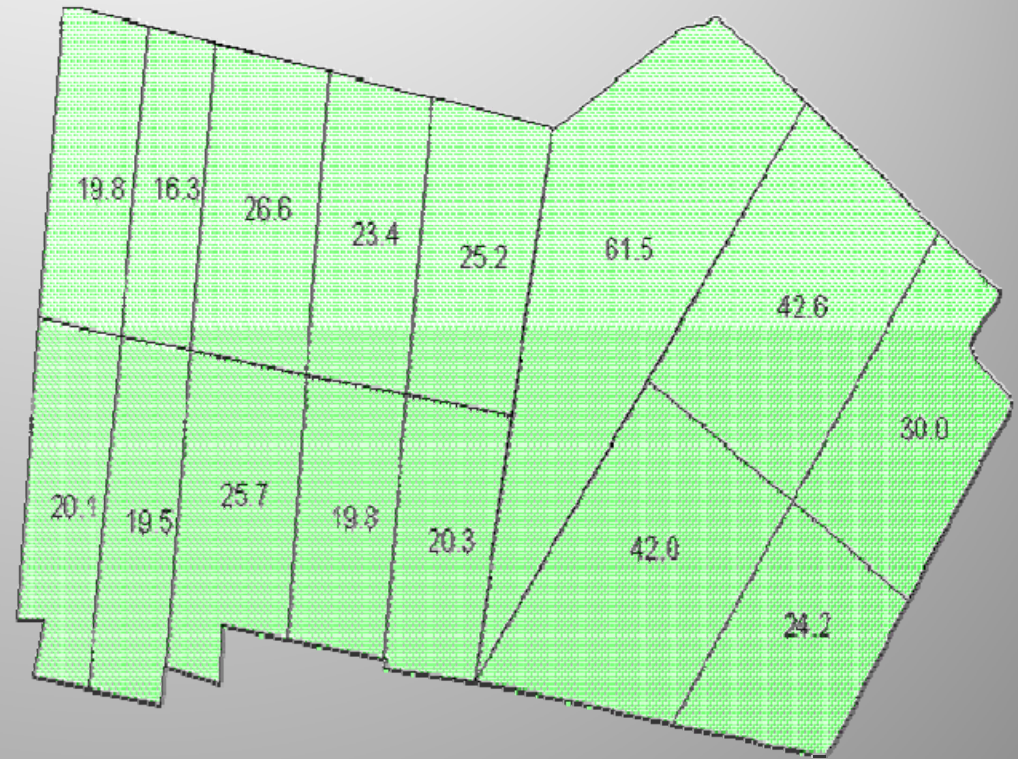
Data Collection



- What are we looking for?
 - Anything that contributes to growing a crop

Field Sizes are getting larger

- Simplifies operations and data collection

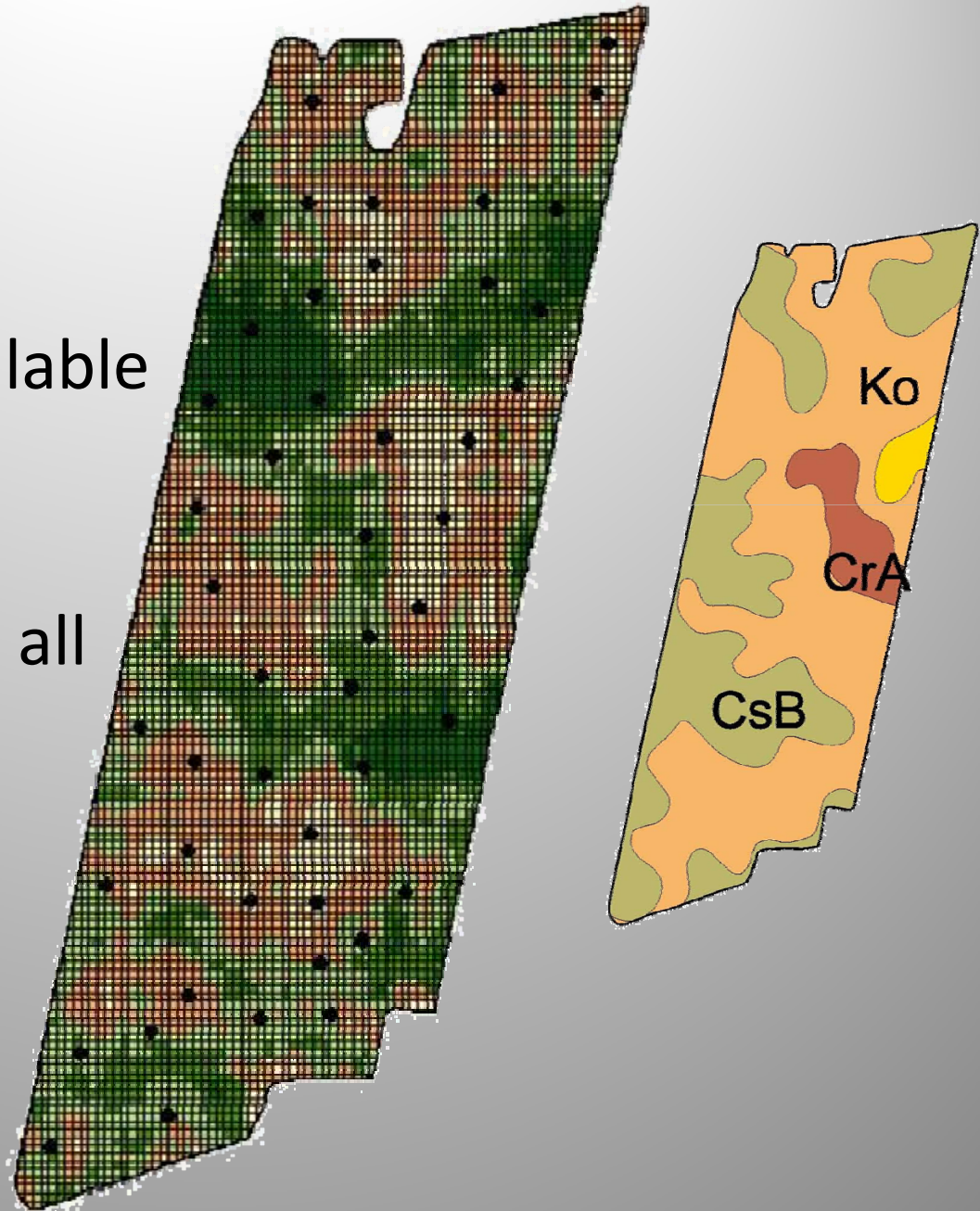


407 ac farm was split into 15 fields

Avg field size 27.1 ac

Soils

- Soil Survey – available on the Web
- Veris EC
- Starting point for all operations!
 - Soil sampling
 - Hybrid Selection
 - Seeding rates

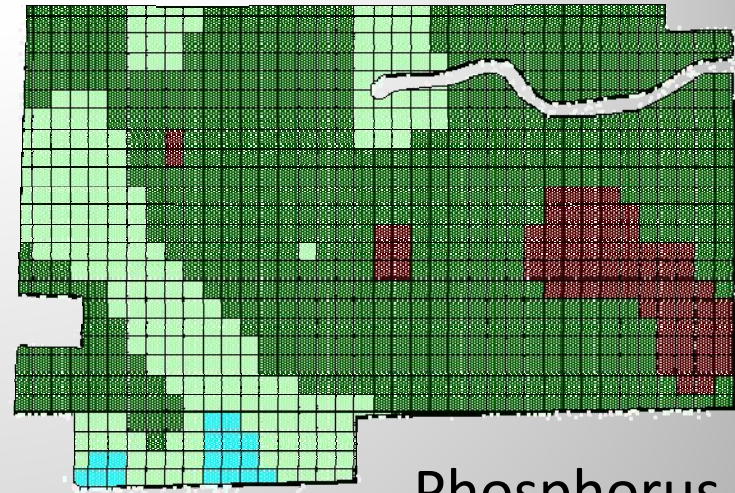


Yield Data

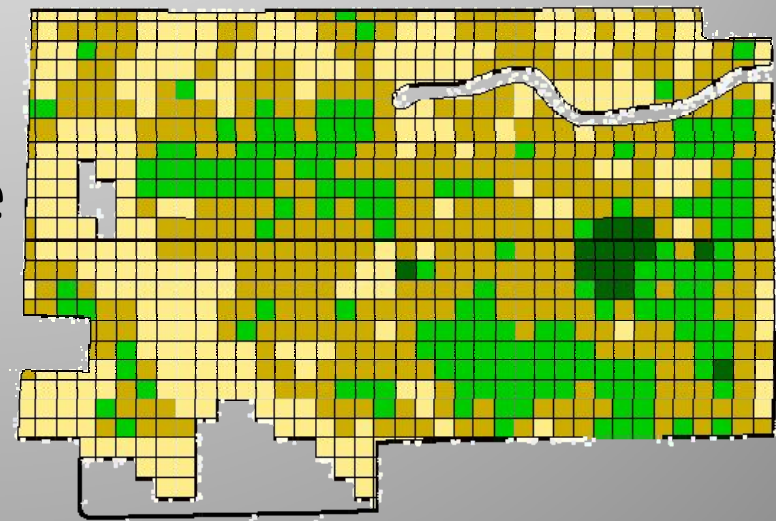


Fertility

- Soil Sampling Results
 - P, K, pH, OM, CEC, etc
- Fertilizer Recommendations
- Work with your retailer/consultant to have a strong sampling program in place because..



Phosphorus



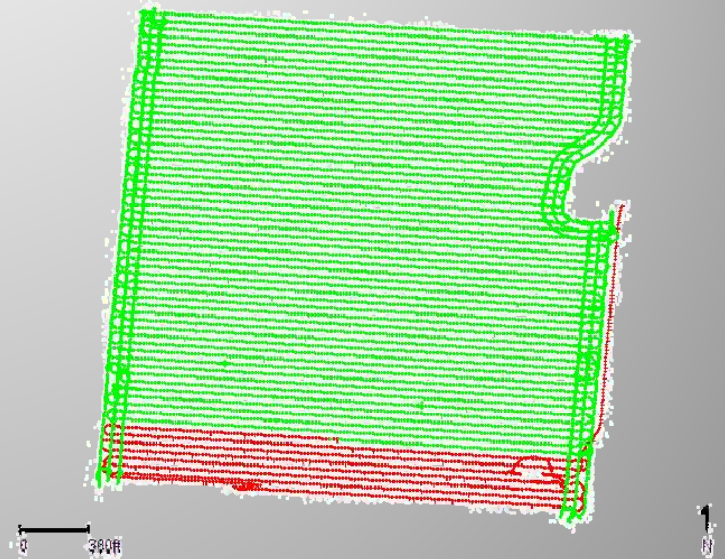
MAP Recommendation

What's The Difference?



Operations

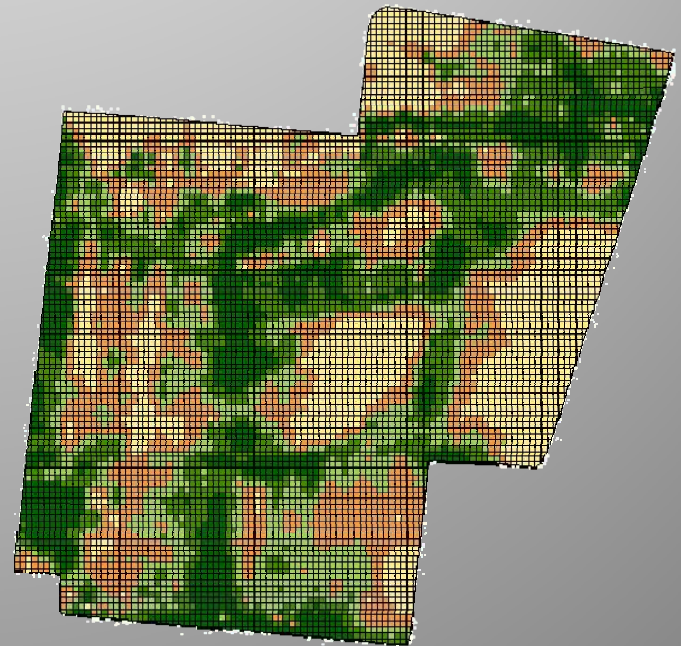
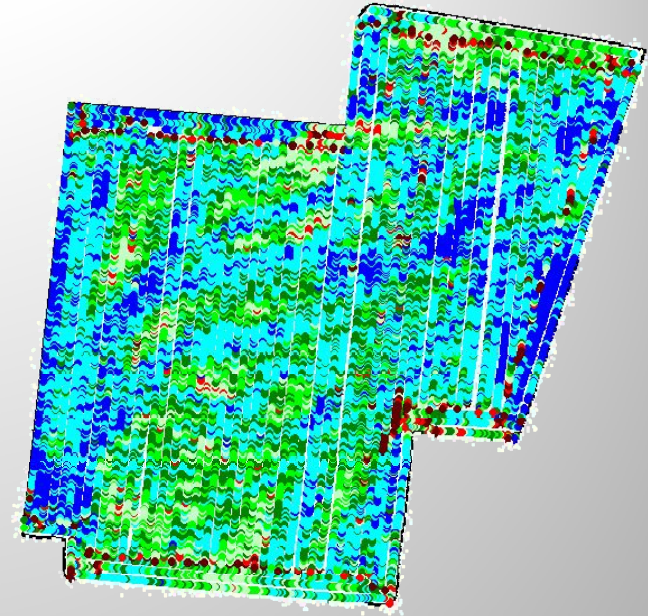
- “As Applied” Maps
 - GPS receiver and display
- Keep an accurate data set of all field operations
 - Tillage, Planting, Spraying, Harvest, Fertilizing/Liming
- Useful for:
 - Productivity Analysis
 - Troubleshooting
 - In-field comparisons
 - Environmental Records



Corn Planting Record
Bt corn with 20% refuge

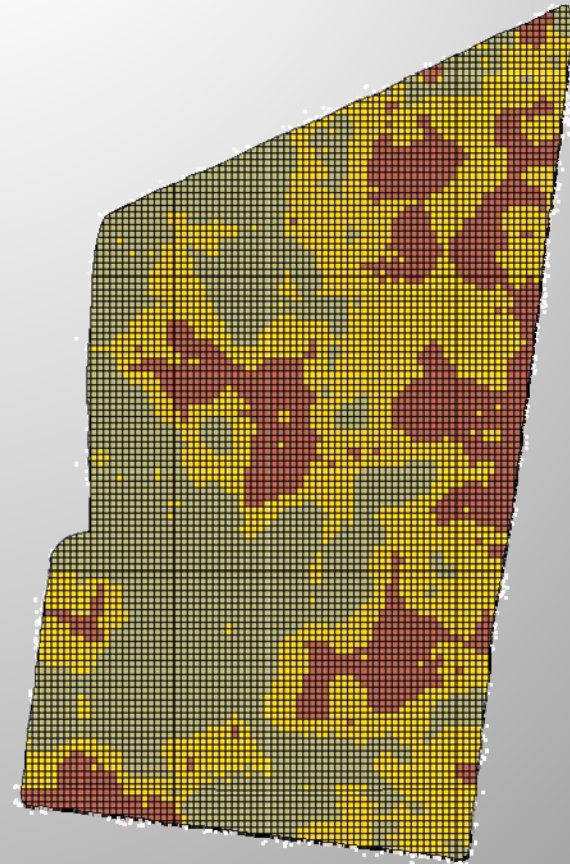
Data Analysis

- Taking everything you've collected to make management decisions for next year
- The Big Three
 - Drainage
 - Lime
 - Fertilizer







What Else to Look At?

- Does a particular practice pay?
 - Variable Rate Seeding
 - Fungicide Application
 - Strip Tillage

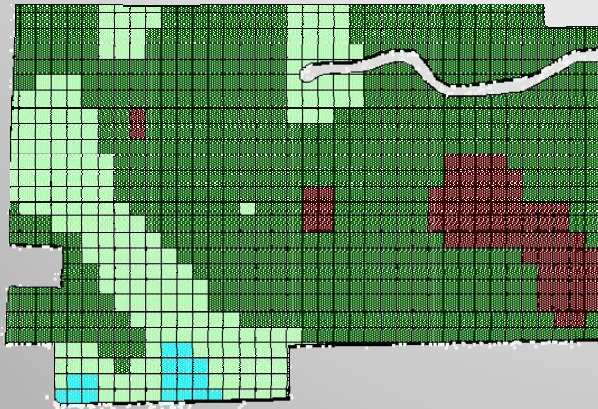


Seed Corn (Veris corn population rate?)

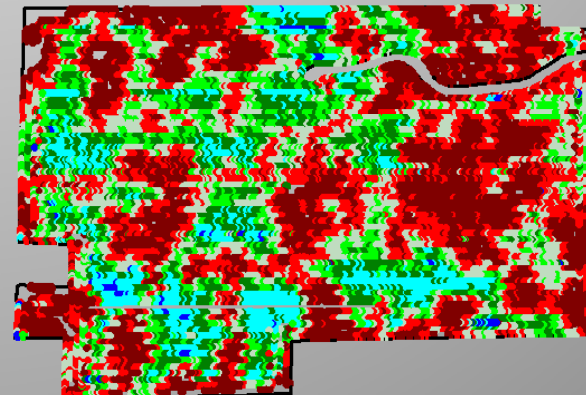
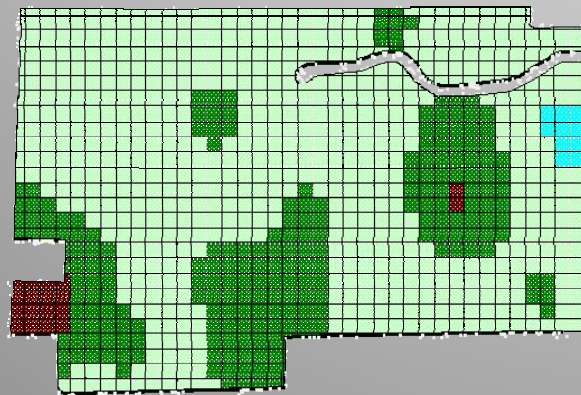
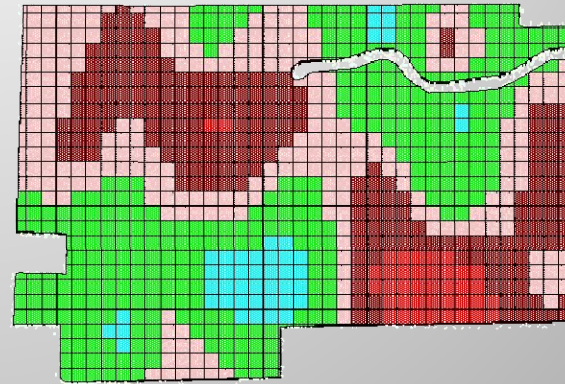
	28000	(14.3 ac.)
	32000	(29.7 ac.)
	35000	(27.8 ac.)
	(71.7ac.)	Field Boundary

Helps Tie Everything Together

Phosphorus



pH

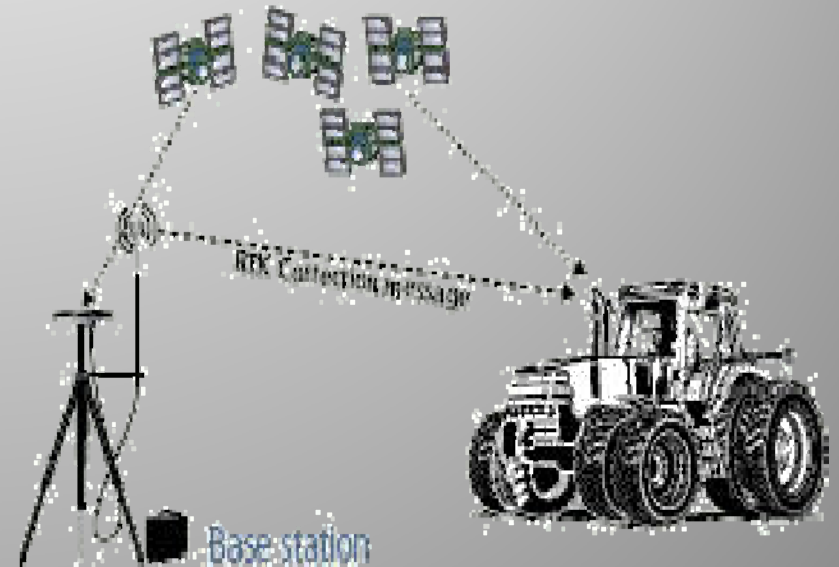


K/Mg Scale

2007 Soy yield Avg 40 bu/ac

- Real Time Kinematic (RTK) is a highly accurate GPS signal that uses data from the GPS satellite L1 and L2 bands
- Requires a “Rover” GPS receiver and radio and a “Base Station” which consists of a stationary GPS receiver and radio
- Offers 1 inch pass to pass repeatable accuracy

RTK Basics

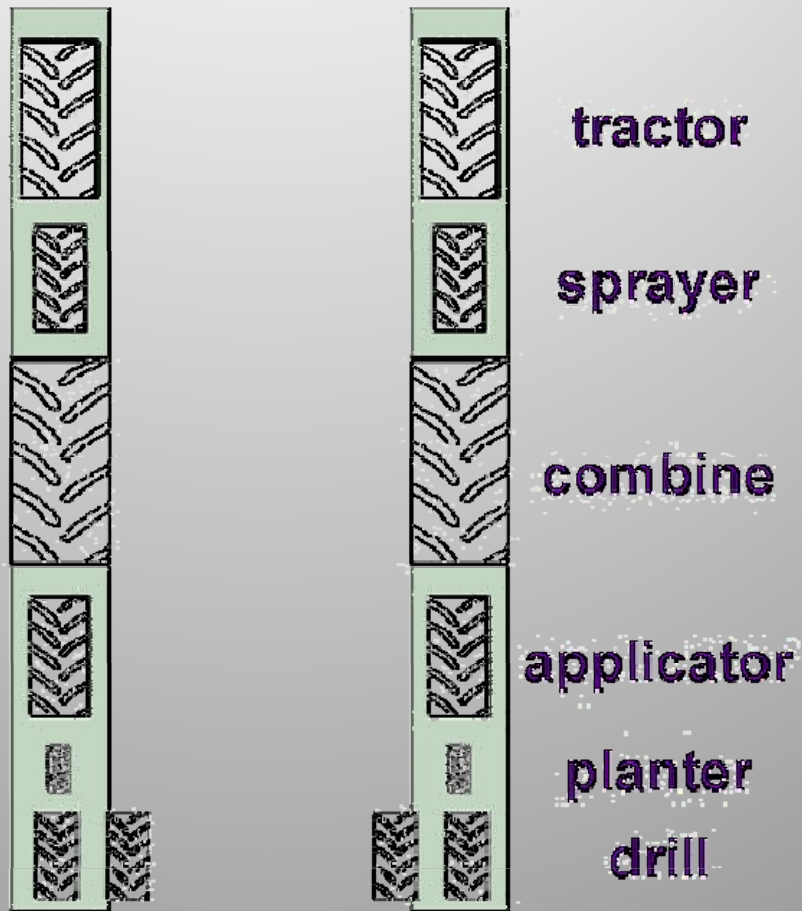


Same Width = Less Compaction



- All implements on same working width: 16 R strip tiller, 16 R planter, 80' or 120' spray booms, 8 R corn head
- Keep Grain Cart on traffic lanes!

Controlled Traffic Wheel Patterns



implement width

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