



Advancements in Agricultural Technology Associated with Precision Farming

*Doug Thompson
2555 1700th Ave
Atlanta, IL 61723
dtfarm@hotmail.com*



Precision Farming

- **Definition:**

Application of crop management techniques that measure, analyze and adjust for variability within a field.

You may have navigated to this meeting using GPS!



Story of a Field

“Flat, black 160 acres.”

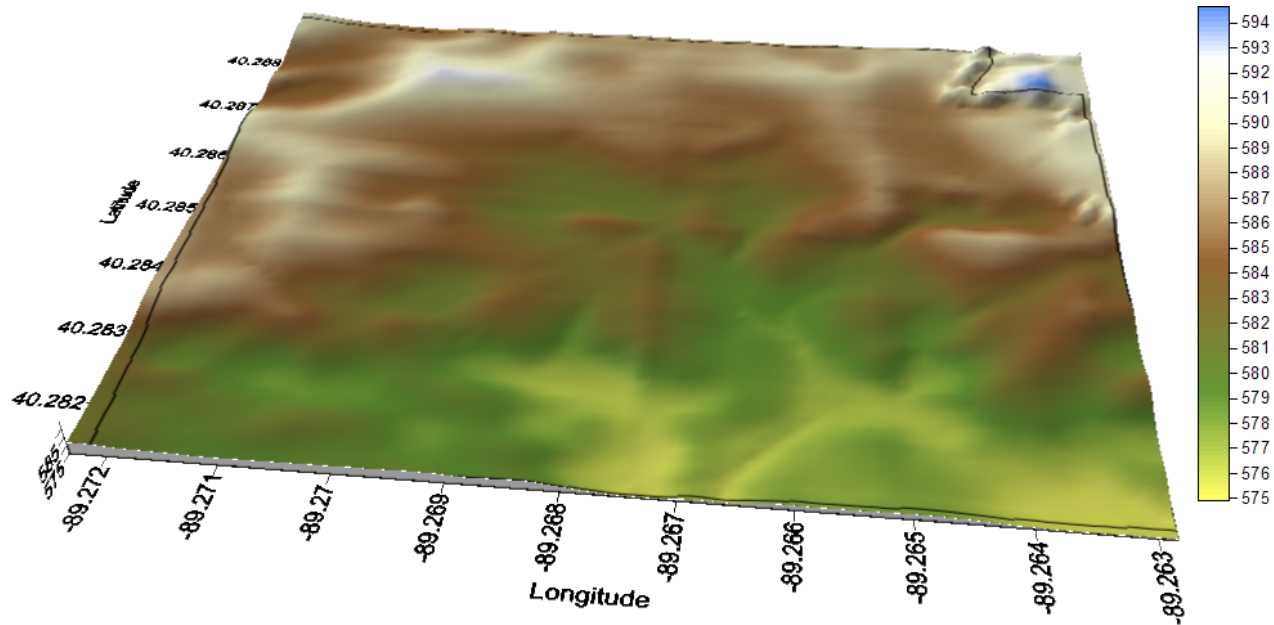
For years, every part of the field was treated the same.

Variability:

Not all parts of the field are the same.

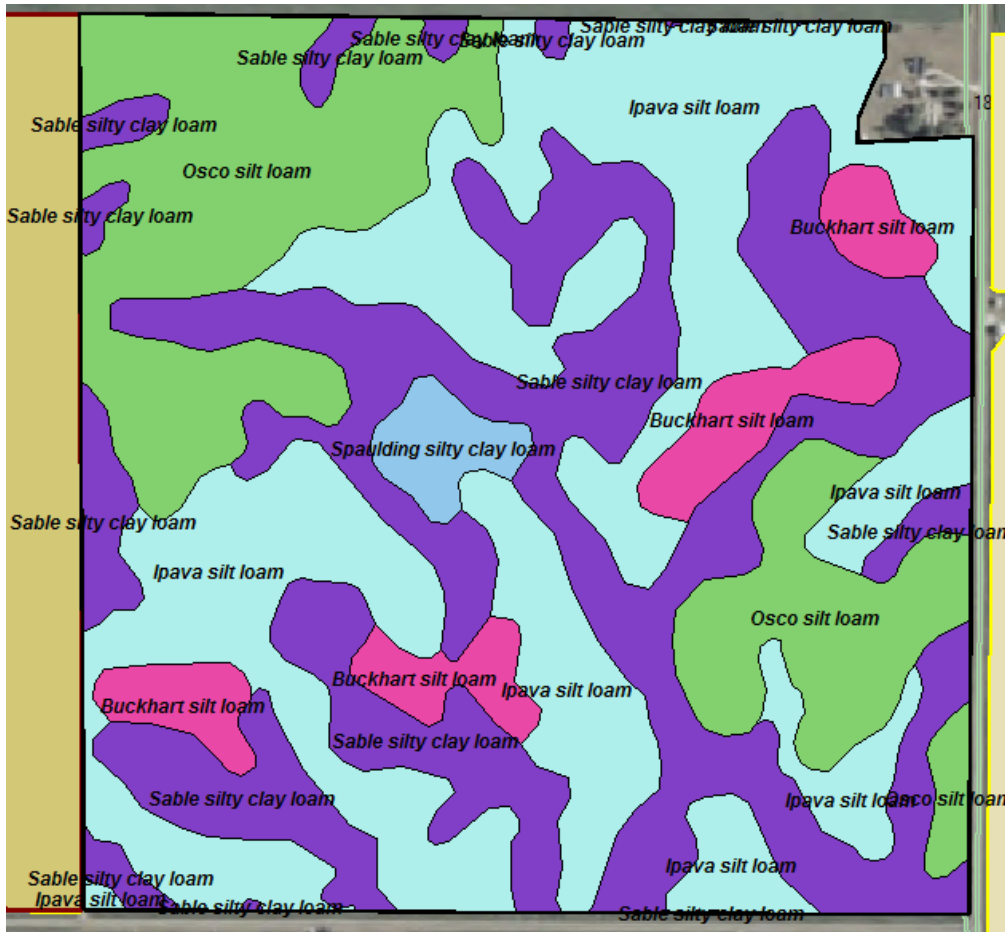


Topographical Map



- Not truly “flat”.
- Fall from high (light blue) to low (yellow) spots is 19 feet.
- Average slope 1%.

Soils Map



5 Soil Types – each with different:

- Productivity
- Slope
- Drainage
- Fertility - ??
- Organic matter



Yield Map



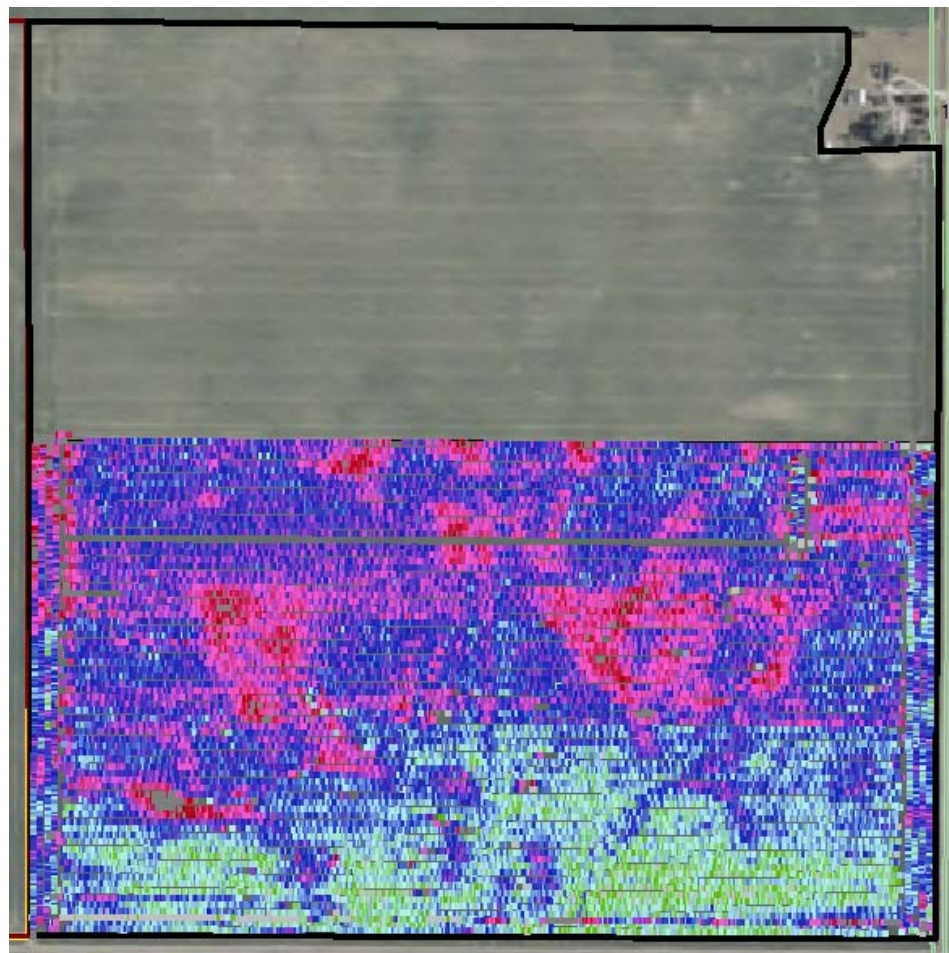
Corn yield map

Red - lower yield

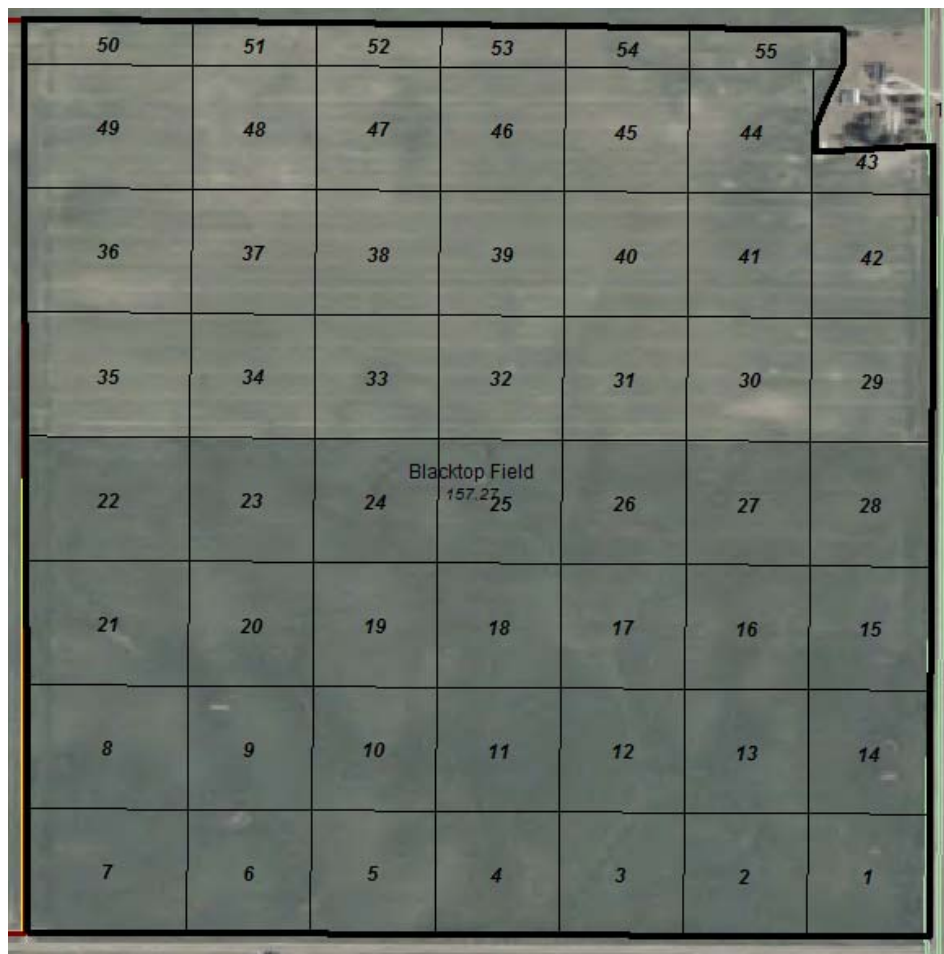
Green - higher yield

Yields can vary greatly due to:

- Soil
- Fertility
- Drainage
- Compaction
- Pests / disease



Grid Map



Was farmed as a **160 acre** field.

Now farmed as **55 ~ 3 acre** fields.

Each grid - separate:

- Soil fertility tests
- Yield history
- Variety history

Grid Yield Maps

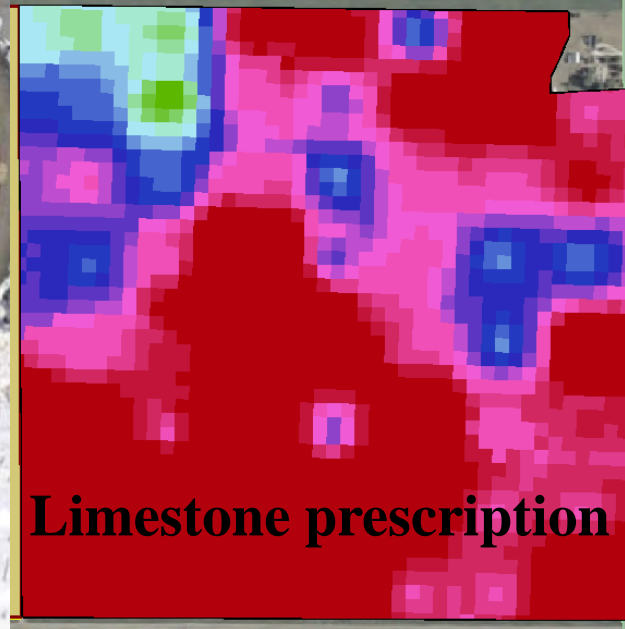
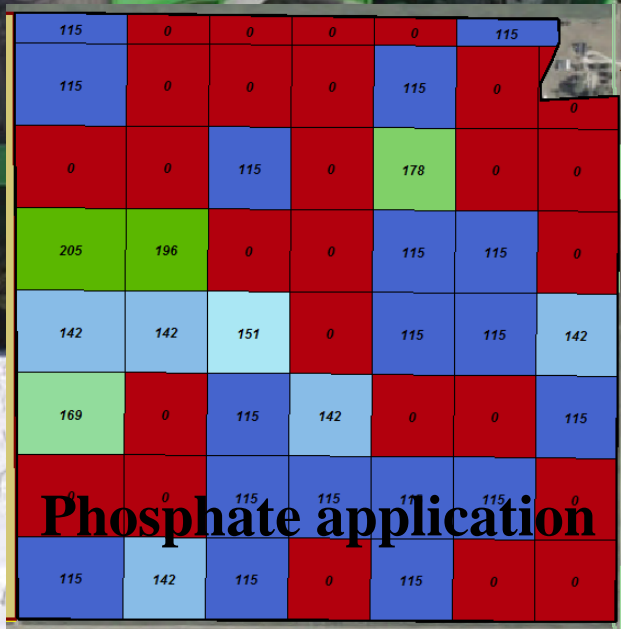


| | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|
| 216.17 | 233.32 | 235.06 | 231.45 | 224 | 222.09 | |
| 196.91 | 198.63 | 191.86 | 196.35 | 201.18 | 199.01 | 203.33 |
| 189.57 | 185.84 | 185.59 | 178.4 | 183.53 | 173.66 | 193.5 |
| 179.5 | 164.8 | 166.29 | 170.85 | 165.41 | 171.71 | 168.66 |
| 181.6 | 185.91 | 180.19 | 177.33 | 186.54 | 185.4 | 181.22 |
| 184.04 | 169.07 | 183.8 | 186.25 | 168.29 | 179.64 | 194.2 |
| 184.02 | 182.75 | 190.62 | 202.58 | 197.24 | 195.31 | 198.78 |
| 207.22 | 210.59 | 213.98 | 208.07 | 219.2 | 218.31 | 208.34 |

Can use this data to generate fertilizer application rates that replace only the fertility removed by the crop.

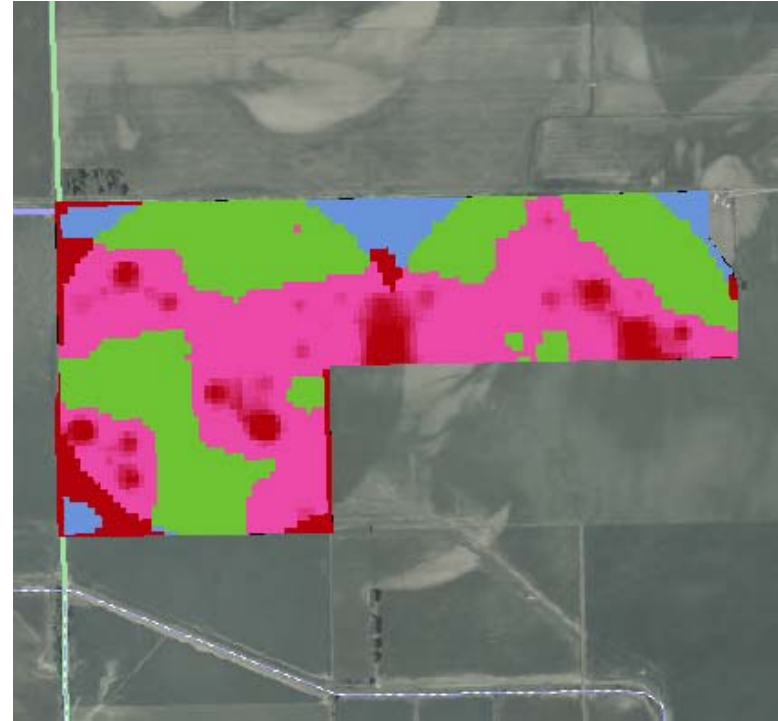
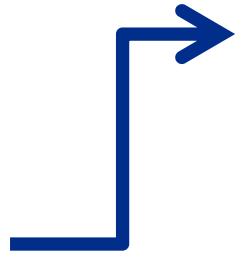
* This map shows corn yields from 2 years.

Variable Fertilizer Rates



A Friend's Field . . .

Irrigated field yield goal:
Less water = less yield



Nitrogen fertilizer rate set by
soil type & water application

Farming Technology - Today

Strip till farming - benefits:

- Disturbs only small area of soil – reduced erosion
- Controlled traffic
- Less energy required
- Conserves moisture
- Places fertilizer near seed & roots
- Faster growth



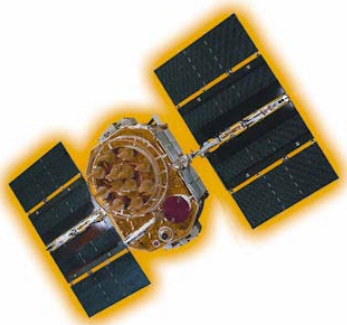
Farming Technology - Today

Strip till Challenges:

- Fall fertilizing time can be limited
- Difficult to see strips in the spring
- Accurate placement of seed required
- Challenge to rotate strip location

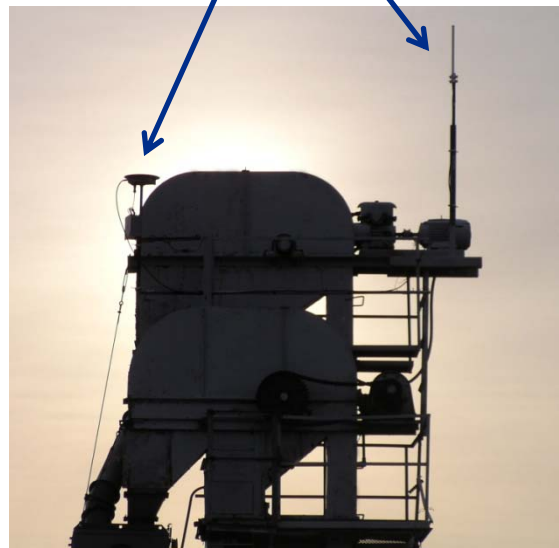


RTK AutoSteer to the Rescue



Automatic steering by GPS
Requires base station
Accuracy +/- 1"

Repeatable year to year
Adjusts for tractor tilt
But, pretty expensive



Autosteer Equipment





Autosteer – making strips



Desired Result



Planting Accuracy



Also
follows
curved
rows





Impress Neighbors – straight rows





Works at Harvest Too





Farmers Like RTK Autosteer

- Reduces fatigue
- Can pay attention to equipment
- Increased efficiency
- Flexible start/stop points
- Match equipment of differing widths
- Works in dusty, dark conditions
- Frees time to manage, communicate

Other Technologies - Today

Crop Sensors:

- senses crop color
- adjusts fertilizer rate

Section Control:

- Turns on/off rows automatically
- Reduces seed/chemical use & cost





Technology – The Future

- Even more precise equipment control
- Real time soil sensors – fertility, moisture
- Sub surface irrigation
 - very efficient water use
 - autosteer avoids damage to pipes
- Detailed data collection
- Real time data transfer & analysis

Large or Small? – or Both

World's largest
planter – 120' wide



Robot fleet – planting,
weeding

Questions?

Doug Thompson
2555 1700th Ave
Atlanta, IL 61723
dtfarm@hotmail.com



Thanks to Allen Sasse, Mike Toohill, Charles Taylor, UniBots.com and numerous manufacturers for providing several of the pictures you've seen here! Thanks also to the many innovators that have paved the way for these methods and technologies.

Hard Day Planting Corn



The actions portrayed in this video are not in any way endorsed or supported by the John Deere Company!