Precision Ag Implementation in my Business

1-31-2014

Matt Weller
Consultant-SW Minnesota
Centrol Crop Consulting
Location-SW Minnesota
Main Crops Grown in SW MN

- Corn
- Soybeans
- Wheat
- Alfalfa
Precision Ag Processes

- Data Collection/Analyzing
  - Grid Soil Sample Data
  - Planting Data
  - Yield Data
  - Veris(EC) Data
  - Soil Images

- Zone Creation-All Areas of the field are not equal
  - Veris
  - Yield Maps
  - Soil Images

- Precision Ag Applications
  - Variable rate fertilizer (N, P, K, zn)
    - Grid
    - Zones over Grids
  - Variable rate Lime
    - Grid
    - Zones over Grids
  - Variable rate Planting (Corn)
    - Zones
  - Data Management (A work in progress)
    - Hybrid/ Variety Selection/ Placement

- Software
- Struggles
Data Collection - *Grid Soil Sample Data*

- 2.5 acre grid soil samples
- Sample every 4 years
- Most samples collected in early summer (soybeans)
- 4 person grid crew
- Use Trimble Nomads for GPS
- 6” samples - P, K, zn, pH, Buffer pH, OM, Soluble Salts
- All information is setup in the winter months
Typical Grid Results

- pH
- Phosphorus
- Organic Matter
- Potassium
- Zinc
Data Collection - **Planting Data**

**Product Name**
- DK 52-04 (56.75 ac)
- DK 53-78 (56.75 ac)

**Date / Time**
- 5/14/2013 - 5/14/2013 (113.49 ac)

**Rate Applied (Count)**
- 36.75 - 44.02 (28.32 ac)
- 36.41 - 36.75 (14.73 ac)
- 34.51 - 36.41 (13.75 ac)
- 34.21 - 34.51 (14.44 ac)
- 32.32 - 34.21 (14.18 ac)
- 29.81 - 32.32 (14.04 ac)
- 0.00 - 29.81 (14.02 ac)

**Grower:** Nettlewynn Farms  
**Farm:** M_N  
**Field:** M_N  
**Year:** 2013  
**Operation:** Planting  
**Crop / Product:** Multiple  
**Op. Instance:** Planting - 1  
**Area:** 113.49 ac  
**Est. Amount:** 3,881.5 ksd  
**Avg. Rate:** 34.20 ksd/ac  
**Start Date:** 5/14/2013  
**End Date:** 5/14/2013  
**Working Time:** 5.011 hr  
**Avg. Productivity:** 19.20 ac/hr  
**GPS Count:** 21602
Data Collection - Yield Data

Estimated Volume (Dry) (bu/ac)
- 194.8 - 396.8 (15.01 ac)
- 176.9 - 194.8 (15.89 ac)
- 162.1 - 176.9 (16.12 ac)
- 148.1 - 162.1 (16.19 ac)
- 132.3 - 148.1 (16.00 ac)
- 108.2 - 132.3 (15.57 ac)
- 5.1 - 108.2 (14.41 ac)

Nettiewynnt Farms | M_N | M_N
2013 | Grain Harvest | Corn | Harvest - 1

Crop / Product: Corn
Area: 109.19 ac
Avg. Yield: 151.91 bu/ac
Avg. Moisture: 17.53 %
Data Collection-Veris *(EC Mapping)*

How does it work?
- Drive every 30-40 feet
- 10-15 MPH
- Measures Electric Conductivity
  - 0-1ft (shallow) and 0-3ft (deep)
Data Collection *Soil Images*

- National Ag. Imagery Program (NAIP) Image
  - Multiple Years
Zone Creation - **Veris (EC Mapping)**

**Advantages**
- Real Time Soil Type Map
- Very Accurate
- No zone modification

**Disadvantages**
- Time Crunch (Fall before tillage)
- Need some moisture
- More Expense
## Zone Creation - Yield Data

### Advantages
- Convenient
- Easy to access the data
- Can work on in winter

### Disadvantages
- Environmental impacts (rain, disease, weeds, etc)
- Sometimes need to modify zones
- Sometimes need multiple years
- Monitor malfunctions (missing data, poor map)
## Zone Creation - *Bare Soils Image*

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenient</td>
<td>Environmental impacts (rain, soluble salts)</td>
</tr>
<tr>
<td>Easy to access the data</td>
<td>Always need to modify zones</td>
</tr>
<tr>
<td>Can work on in winter</td>
<td>Sometimes need multiple years</td>
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</table>
Zone Creation - All

Veris Zones

Yield Zones

Soil Imagery Zones
Precision Ag. Applications - VR Fertilizer (grid)

- Apply Fertilizer according to the grid results ONLY

Fertility Map (Phosphorus)

*Low Fertility = More Fertilizer*

*High Fertility = Less Fertilizer*
Problems with a grid ONLY

• Does not account for yield potential variability
  – 1 yield goal across field
Fix to this problem-Add Zones to Equation

• Management zones define the productivity of a certain part of the field
Pulling it all together - *Zones over Grids*

Yield Goal (Productivity) Map

Fertility Map (Phosphorus)

**Low Yield, High Fertility = Very Little Fertilizer**

**High Yield, Low Fertility = A lot of Fertilizer**
Precision Ag Applications - **VR Lime**

- Zone map
- Lime Application map
Precision Ag Applications - **VR Planting**

- Create planting Rx after consultation with producer
- Load Rx onto monitor and make sure it works properly
Precision Ag Applications - **VR Soygreen**

- Created using soybean yield data along with confirmation from grid sample
- Create soygreen (iron product) Rx after consultation with producer
- Load Rx onto monitor and make sure it works properly
## Precision Ag Applications-Data Mgmt

Yield by Hybrid

### Analysis Description

Allows the comparison of an attribute(s) or property(s) against other attributes/properties.

John Lucass, Lucas Farms | (All) | (All) | 2013 | Grain Harvest | Corn | (All) | (All) | (All)

### Analysis Results: Estimated Volume (Dry), Moisture

Classified By: Planting; Product - Name

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Avg. Estimated Volume (Dry)</th>
<th>Total Estimated Volume (Dry)</th>
<th>Min. Estimated Volume (Dry)</th>
<th>Max. Estimated Volume (Dry)</th>
<th>Avg. Moisture %</th>
<th>Total Moisture %</th>
<th>Min. Moisture %</th>
<th>Max. Moisture %</th>
<th>Area (ac)</th>
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### Graphs

1. [Graph of Data Mgmt](#)
2. [Graph of Area (ac)](#)
Software Used

• AgLeader SMS Advanced
  • Planting Data
  • Yield Data
  • Data Analysis (yield by hybrid)
  • Zone Creation

• SST Software
  • VR fertilizer Rx
Struggles/What’s Next

- Staying organized
- Workload
- Staying on the cutting edge
- Data Management
  - Price
  - What’s included

- What’s next?
  - VR herbicide application
  - VR insecticide application
  - Others?
Thank You!!

Matt Weller
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