Finding the Value
In Precision (Geo-Referenced)
Soil Sampling
Conclusion Number 1

History adds value to soil test information
How much confidence would you place in a single soil test result without history?
**Effectiveness of Soil Testing as a Guideline to Fertilizer Rate and Crop Response**

<table>
<thead>
<tr>
<th>Description</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimum fertilizer rate to apply for a specific field and/or year.</td>
<td>Fair</td>
</tr>
<tr>
<td>Relative yield response for a specific location and/or year.</td>
<td>Fair</td>
</tr>
<tr>
<td>Average long-term optimum fertilizer rate to apply over a number of years.</td>
<td>Fair-Good</td>
</tr>
<tr>
<td>Relative long-term yield response averaged over a number of years.</td>
<td>Good</td>
</tr>
<tr>
<td>Probability of a yield response.</td>
<td>Very Good</td>
</tr>
<tr>
<td>Soil fertility status over time.</td>
<td>Very Good</td>
</tr>
</tbody>
</table>
Traditional soil sampling systems, how well are we doing?

• Lack of a field identification system that allows for comparison of soil test results over time.
• No convenient method for tracking nutrient applications.
• Lack of uniformity in sampling system.
• Inconsistent sampling technique - time, depth, number of cores, etc.
Conclusion Number 2

The ability to geo-reference has tremendous potential for increasing the value of soil testing.
Geo-referenced field boundaries and sample points add value.
Wisconsin Soil Sampling System

20 acre field
min. 5 cores

sample 1
W

sample 2
W

sample 3
W

sample 4
W
Conclusion Number 3

- The merits of precision soil sampling and variable rate application of crop nutrients or lime should be considered separately.
The ability to vary the application rate of fertilizer was a technological breakthrough.
IMPLEMENTATION

Level Of Technology

INTEGRATED CROP MANAGEMENT PLANNING & PROFIT ANALYSIS

GPS, SOIL SAMPLING, YIELD MONITORING, GIS PROBLEM SOLVING

VARIABLE RATE

IMPLEMENTATION
Grid Sampling
- Point Sampling
- Cell Sampling

Samples From Within 2-15’ Diameter Circle (Point Sample)

Samples Randomly Collected From Within Grid Cell (Cell Sample)

300 x 300’ Grid

2.1 Acre Cell
Relation Between Grid Size and Acres per Sample

<table>
<thead>
<tr>
<th>Grid Size (ft)</th>
<th>Acres per Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 x 100</td>
<td>0.23</td>
</tr>
<tr>
<td>208 x 208</td>
<td>1.00</td>
</tr>
<tr>
<td>250 x 250</td>
<td>1.43</td>
</tr>
<tr>
<td>295 x 295</td>
<td>2.00</td>
</tr>
<tr>
<td>330 x 330</td>
<td>2.50</td>
</tr>
<tr>
<td>360 x 360</td>
<td>3.00</td>
</tr>
<tr>
<td>440 x 440</td>
<td>4.44</td>
</tr>
</tbody>
</table>
What is Realistic?
Sampling Grid Size, acres

1  2  3  4  5  6  7  8  9  ....

Interpolate ----- “Think” ------ Composite
Use a “smart” sampling scheme that helps identify the variability and differences in the field.
Management Zones?
Soil Sampling Systems
Decision-making Value

![Bar Chart]

- Comp.
- Comp.
- GeoComp
- L.Grids
- Geo-Soil
- Smart
- Sm.Grids

With History
Geo-referenced Soil Sampling- Finding the Value

• Provides a permanent record of field boundaries
• Provides a history of sample locations
• Versatility. Value to all sampling systems.
• Adding value to the data allows the opportunity to reposition this service with growers.