2012 Soil Fertility Seminars

Early Summer Sampling

Benefits for Growers, Dealers, Agronomists

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Agronomist
AGVISE Laboratories
Benson, MN
Trends in Early Summer Sampling

2001 - 2011

Early Season Soil Samples
Jan. 1 upto Aug. 1
2001 to 2011

Benson lab
Trends in Early Summer Sampling
2001 - 2011

<table>
<thead>
<tr>
<th>Year</th>
<th>% Early Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>28%</td>
</tr>
<tr>
<td>2002</td>
<td>37%</td>
</tr>
<tr>
<td>2003</td>
<td>36%</td>
</tr>
<tr>
<td>2004</td>
<td>32%</td>
</tr>
<tr>
<td>2005</td>
<td>32%</td>
</tr>
<tr>
<td>2006</td>
<td>30%</td>
</tr>
<tr>
<td>2007</td>
<td>30%</td>
</tr>
<tr>
<td>2008</td>
<td>36%</td>
</tr>
<tr>
<td>2009</td>
<td>42%</td>
</tr>
<tr>
<td>2010</td>
<td>40%</td>
</tr>
<tr>
<td>2011</td>
<td>41%</td>
</tr>
</tbody>
</table>
Trends in Soil Sampling
Increase Early & Fall Samples

Annual Soil Sample Volume
Benson Lab (2000 - 2011)
2011 Benson: 72% of all samples were Grid/Zone samples
Early Summer Precision Sampling

1. Mostly 2.5 acre grid
   • Intended for Fall fertilizer application

2. Topsoil sample (0-6 inch depth)
   • Most test for: P, K, Zn, pH, salts, BpH & OM
   • Some test for: CEC, Sulfur and Boron

3. Sample in the planted soybean crop
   • Hand probe
   • Wintex 1000

4. Goal is to be done sampling by July 4th
Benefits and Advantages of Early Summer Sampling for Growers, Dealers, Samplers and Agronomists

1. Everyone avoids the rush & delays of fall sampling

2. All summer to generate soil reports, visit with growers, develop spread maps

3. Start fertilizer application right after harvest

4. Consistent soil cores and good soil sample condition
   Falls can be inconsistent in soil conditions, esp. if tillage is involved.

5. Test results are very similar and comparable between early summer and fall sampling
Fall sample after chisel/disk.
Phos. (ave) = 10

Very poor sampling conditions.
- Poor quality cores.

Early Summer sample in crop.
Phos. (ave) = 39

• Grower comment:
• More representative to field history.
Fall sample after chisel/disk. Potassium (ave) = 89

Very poor sampling conditions.
- Poor quality cores.

Early Summer sample in crop. Potassium (ave) = 205

• Grower comment:
• More representative to field history.

Data and images supplied by Midwest Independent Soil Samplers, Hutchinson, MN
Sampling Tilled vs Untilled Soil

Wheel track sampling

1. Soil is compressed for a more representative profile
2. Test results will be more like a sample on stubble
3. Soil probe tips will cut a compressed soil surface much better than a cloddy surface
Sampling Tilled vs Untilled Soil
Inside the soil probe

**Tilled:**
1. Larger particles
2. Less compact
3. Less repeatable/consistent
4. Less soil/more air space
5. Phos. = 22

**No Tillage:**
1. Small particles
2. More compact
3. More repeatable/consistent
4. More soil/less air space
5. Phos. = 33
Sampling Tilled vs Untilled Soil

Phosphorus

<table>
<thead>
<tr>
<th>Year</th>
<th>Olsen P test (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 tilled</td>
<td>28, 18, 33, 16</td>
</tr>
<tr>
<td>2002 stubble</td>
<td>44, 33, 29</td>
</tr>
</tbody>
</table>

2001 tilled vs 2002 stubble
Sampling Tilled vs Untilled Soil
Phosphorus

Olsen P test (ppm)

2001 tilled 2002 stubble 2002 tilled 2002 track

[Diagram showing phosphorus levels for different years and tillage practices]
Sampling Tilled vs Untilled Soil

Potassium

K test (ppm)

0 100 200 300 400 500

2001 tilled 2002 stubble 2002 tilled 2002 track

<table>
<thead>
<tr>
<th>Year</th>
<th>2001 tilled</th>
<th>2002 stubble</th>
<th>2002 tilled</th>
<th>2002 track</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>306</td>
<td>329</td>
<td>333</td>
<td>267</td>
</tr>
<tr>
<td>9</td>
<td>291</td>
<td>303</td>
<td>311</td>
<td>261</td>
</tr>
<tr>
<td>11</td>
<td>283</td>
<td>303</td>
<td>259</td>
<td>256</td>
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Sampling Tilled vs Untilled Soil

Nitrogen

<table>
<thead>
<tr>
<th>Year</th>
<th>Stubble</th>
<th>Tilled</th>
<th>Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>43</td>
<td>28</td>
<td>11</td>
</tr>
<tr>
<td>2002</td>
<td>34</td>
<td>30</td>
<td>11</td>
</tr>
<tr>
<td>2002</td>
<td>46</td>
<td>41</td>
<td>48</td>
</tr>
</tbody>
</table>
### Sample Date Comparison

**Early Summer vs Fall**

Benson lab comparison of all soil samples 2001 - 2011

<table>
<thead>
<tr>
<th></th>
<th>Spring/E Summer</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P-O</strong></td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td><strong>P-B1</strong></td>
<td>34</td>
<td>31</td>
</tr>
<tr>
<td><strong>K</strong></td>
<td>195</td>
<td>196</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>6.9</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Zn</strong></td>
<td>1.6</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Thousands of soil samples compiled and compared
Sample Date Comparison Project
Early Summer (in crop) vs Fall (post harvest)

9 fields were sampled and 73 sample points
2010: 4 fields & 28 sample points
2011: 5 fields & 45 sample points

Sampled twice:
1) Early Summer: After soybean emergence
2) Fall: After soybean harvest, prior to tillage
3) Topsoil sample (0-6” depth)
4) All points were GPS marked & relocated
Sample Date Comparison Project

Early Summer (in crop) vs Fall (post harvest)

<table>
<thead>
<tr>
<th>Year</th>
<th>Fields</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>4 Fields</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 south of Benson, MN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 northeast of Benson, MN</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>5 Fields</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 northwest of Marshall, MN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 south of Sioux Falls, SD</td>
<td></td>
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</table>
Sample Date Comparison Project
Early Summer vs Fall

pH

<table>
<thead>
<tr>
<th>pH</th>
<th>4</th>
<th>4.5</th>
<th>5</th>
<th>5.5</th>
<th>6</th>
<th>6.5</th>
<th>7</th>
<th>7.5</th>
<th>8</th>
<th>8.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>4.5</td>
<td>4.5</td>
<td>5</td>
<td>5.5</td>
<td>6</td>
<td>6.5</td>
<td>7</td>
<td>7.5</td>
<td>8</td>
<td>8.5</td>
</tr>
<tr>
<td>Oct</td>
<td>7.0</td>
<td>7.0</td>
<td>7</td>
<td>7.5</td>
<td>8</td>
<td>8.5</td>
<td>9</td>
<td>9.5</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

Average
June = 7.0
Oct. = 7.0

2011 Very Dry Fall Conditions

2010

AGVISE LABORATORIES
Sample Date Comparison Project

Early Summer vs Fall

Organic Matter

Average
June = 5.1
Oct. = 4.8

Oct June

Sample Date Comparison Project
2010
2011

Red Oct  Black June

2010

AGVISE LABORATORIES
Sample Date Comparison Project
Early Summer vs Fall

Phosphorus
(Olsen & Bray)

Average
June = 15
Oct. = 14

2010
2011
Sample Date Comparison Project
Early Summer vs Fall

Potassium

Average
June = 189
Oct. = 173

2011 Very Dry Fall Conditions

2010
Sample Date Comparison Project
Early Summer vs Fall

Zinc

Average
June = 1.4
Oct. = 1.2

Oct
June
Average
June = 1.4
Oct. = 1.2

2010
Sample Date Comparison Project
Early Summer vs Fall

Salts

Average
June = 0.65
Oct. = 0.83
What Sampling Time is Better?

Mallarino and Clover, 2009

Soil Test K Class

Corn Yield Increase (%)

FALL APRIL JUNE

Soybean Yield Increase (%)

FALL APRIL JUNE

Mallarino and Clover, 2009
Phosphorus – Seasonal Trend 2011

Average of 4 topsoil samples from two fields sampled weekly near Northwood, ND

4.0 ppm seasonal average
Potassium – Seasonal Trend 2011

144 ppm seasonal average

Average of 4 topsoil samples from two fields sampled weekly near Northwood, ND
Soil pH

8.0 seasonal average

Average of 4 topsoil samples from two fields sampled weekly near Northwood, ND
3.6% seasonal average

Average of 4 topsoil samples from two fields sampled weekly near Northwood, ND
Zinc – Seasonal Trend 2011

Average of 4 topsoil samples from two fields sampled weekly near Northwood, ND

1.1 ppm seasonal average
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Annual Meeting
Feb. 21, 2012
Aberdeen, SD
Ramkota Inn
10 AM to 4 PM
2012 Precision Ag Conference
Wednesday, February 22
Ramkota Inn, Aberdeen SD

Registration is $20 per person until February 15.
$25 per person at the door.

iGrow®
A Service of SDSU Extension
2012 Precision Ag Conference

- Program information and registration will be available at [www.iGrow.org](http://www.iGrow.org) or contact Mark Rosenberg at 605-626-2780 or mark.rosenberg@sdstate.edu
2012 Precision Ag Conference

Featured Speakers include

• Kurt Reitsma, SDSU Extension
• Dr Dan Humburg, SDSU
• Tom McGraw, Midwest Independent Soil Samplers
• Calbe Kleinsasser, Raven Industries

   Plus a Trade Show featuring Precision Ag services and businesses
1) Feb. 1, 2012: Change occurs
2) Each individual will have to create a their own user name.
3) Surety Pro version will be available ~ March 2012
4) Price stays the same for 2012:
   1) $300 for first user
   2) $150 for each additional user
FSA Map Services Update
Surety Online Mapping
From Agridata, Inc.