

2011 Soil Fertility Seminars

Soil Sampling Projects



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Jamestown, ND



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Who Opened the Floodgates This Fall???

What happened in Oct. 2010?

Early, Fast and Furious harvest

Excellent soil sampling conditions for 4 continuous weeks in our whole trade area.

FLOOD of soil samples:

- Record daily volume

- Everyone was sampling at the same time

- No weather/rain delays (Sept. 25 – Oct. 25)

More precision (grid and zone) samples

What will happen 2011?

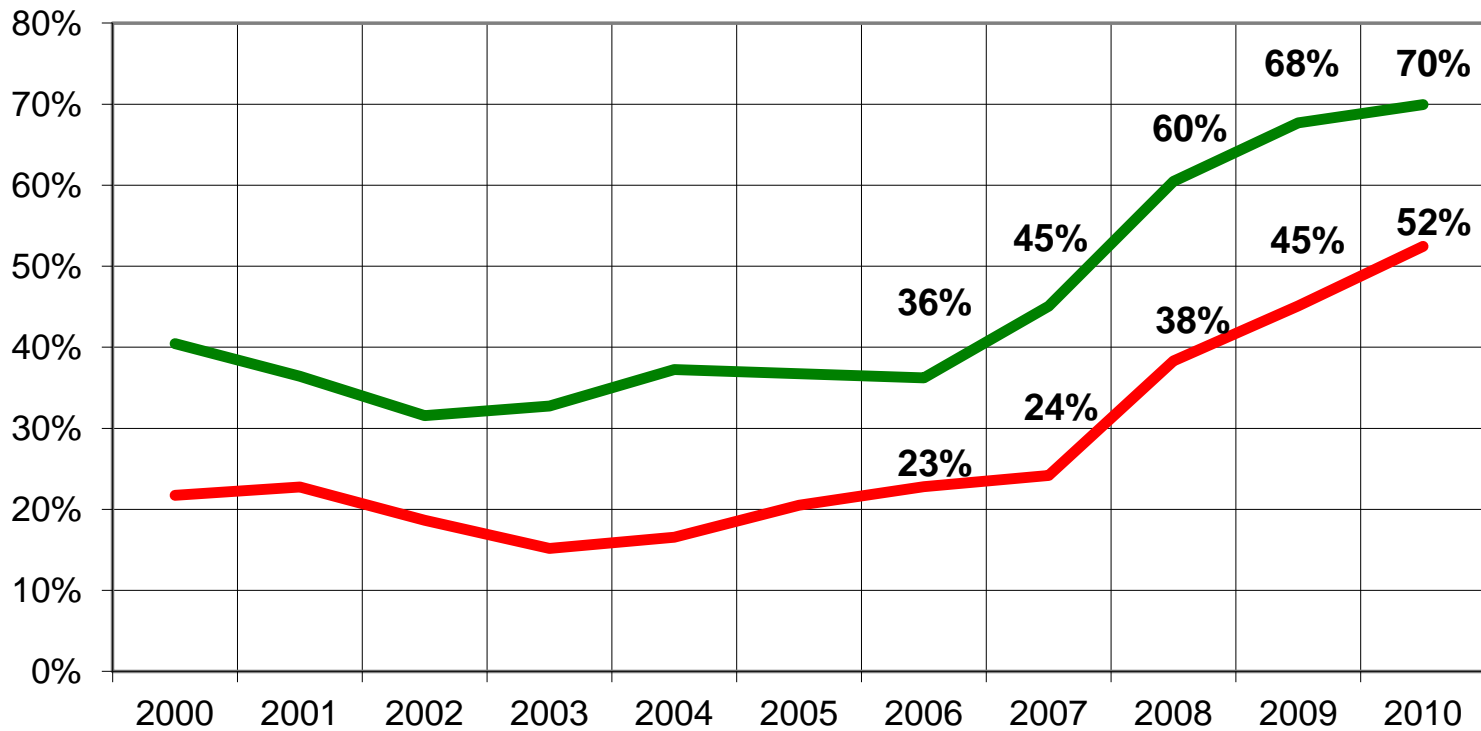
1. Increase our daily capacity.
 - 2009 = 2,000/day
 - 2010 = 2,600/day
 - 2011 = at least 3,000/day
2. Add more testing equipment. (~ \$200,000)
 - Increase drying and grinding capacity
 - Add K & Zn machine (25%+)
 - Add 3 phosphorus machines (50% +)
 - Add OM machine (50%+)
 - Automate pH and salts (50%+)
 - Add 2 more N & S machines (40%+)
 - Add another Total N machine (25%+)
3. Add more personnel as needed. New Chemist hired.
4. Continue to operate 6 days/week

Trends in Soil Sampling

Increase in Precision Samples

Grid/Zone Percentage Comparison
MN & SD

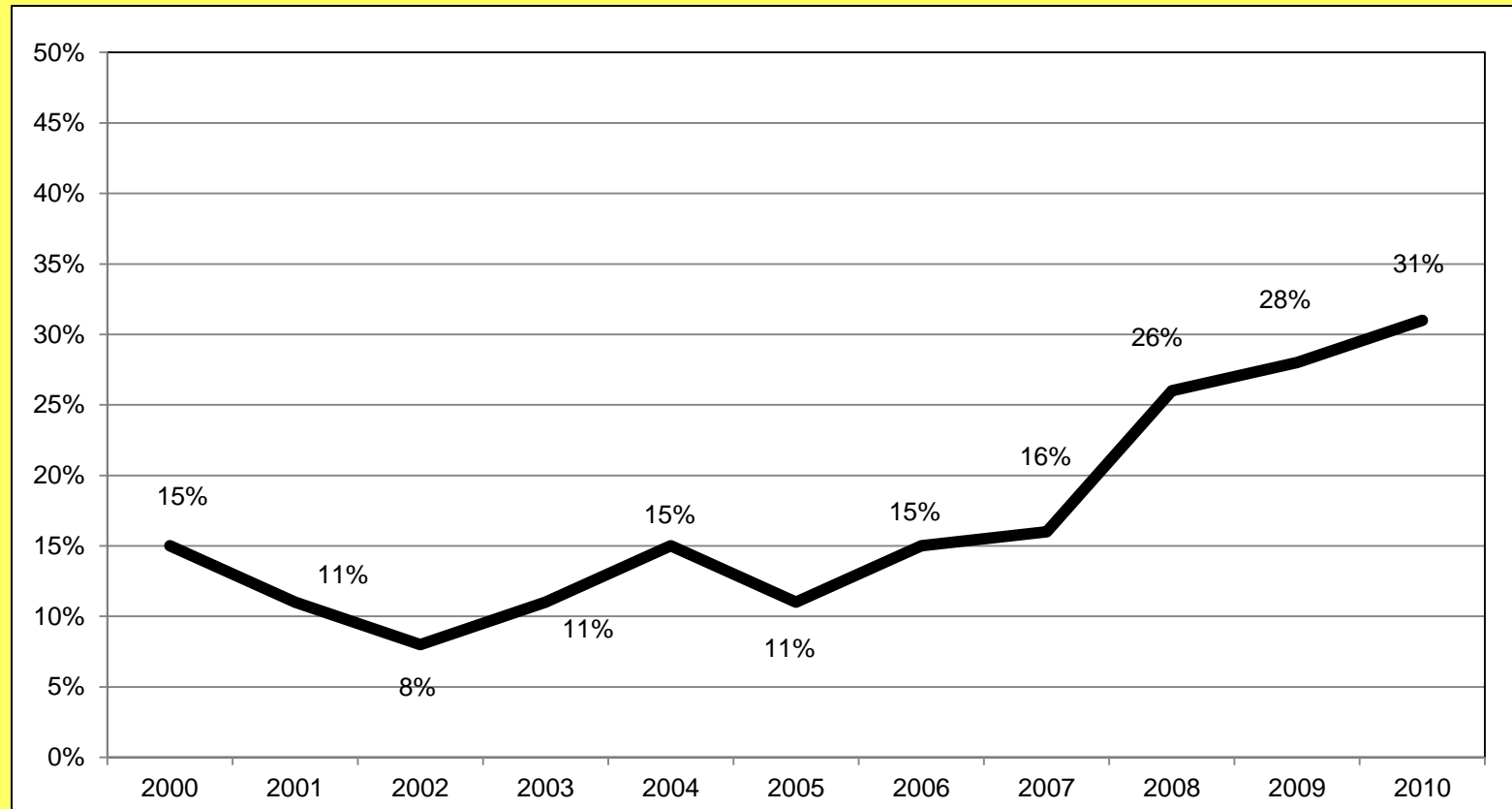
MN % G/Z
SD % G/Z



Trends in Soil Sampling

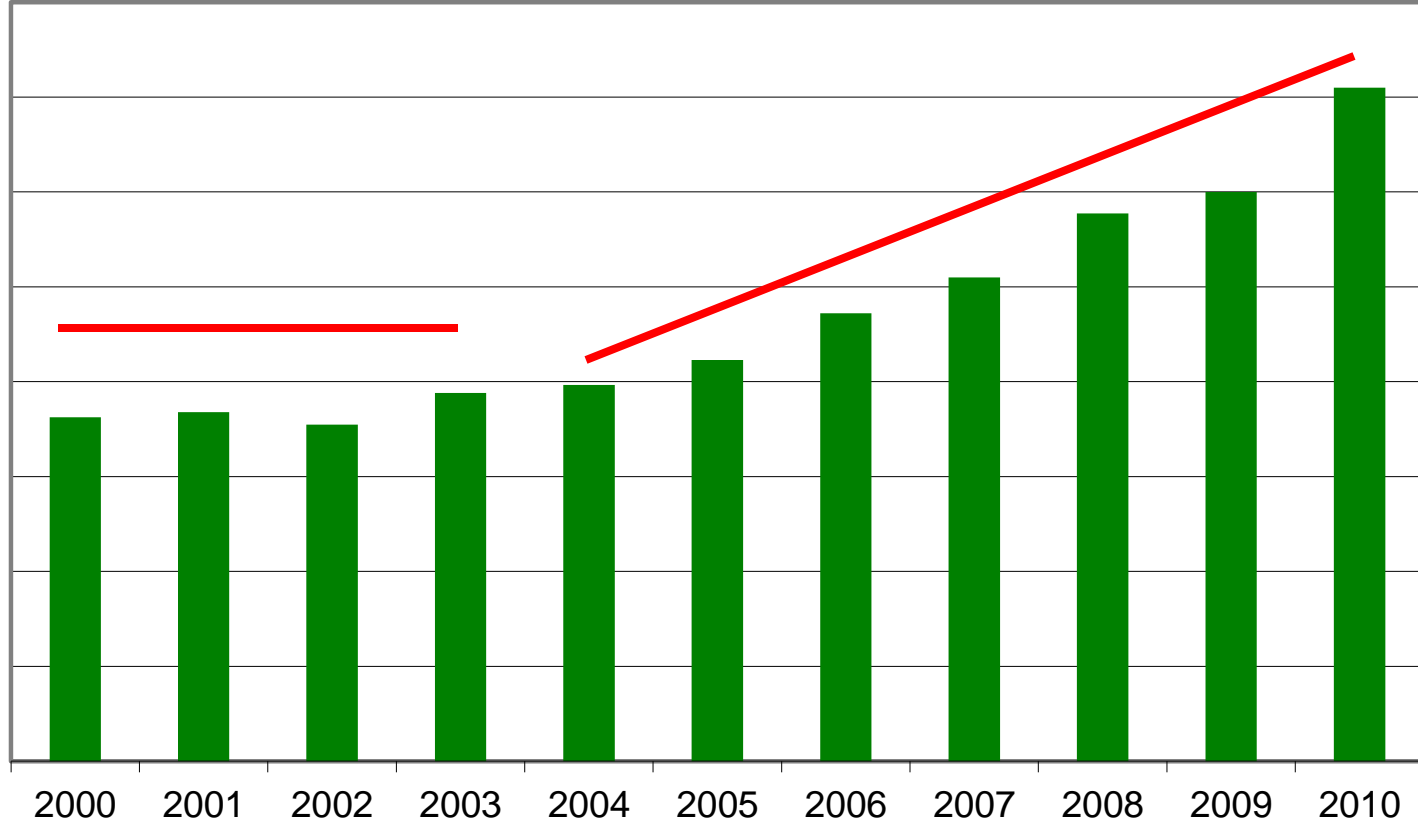
Grid/Zone Percentage Comparison

ND, MT, MB & NW MN



Trends in Soil Sampling

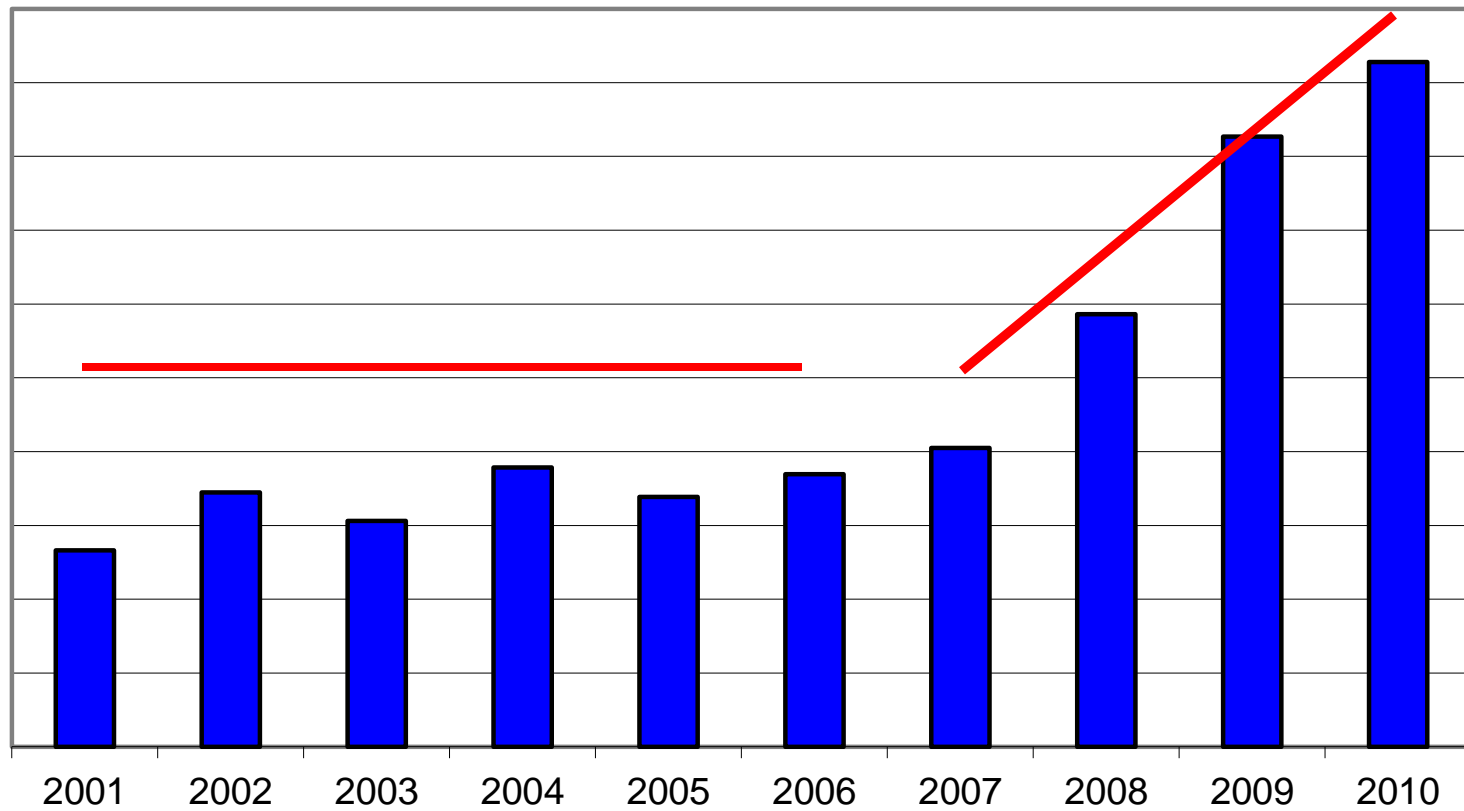
Annual Soil Sample Volume
Benson Lab (2000 - 2010)



Trends in Soil Sampling

Mostly May & June Grid Samples

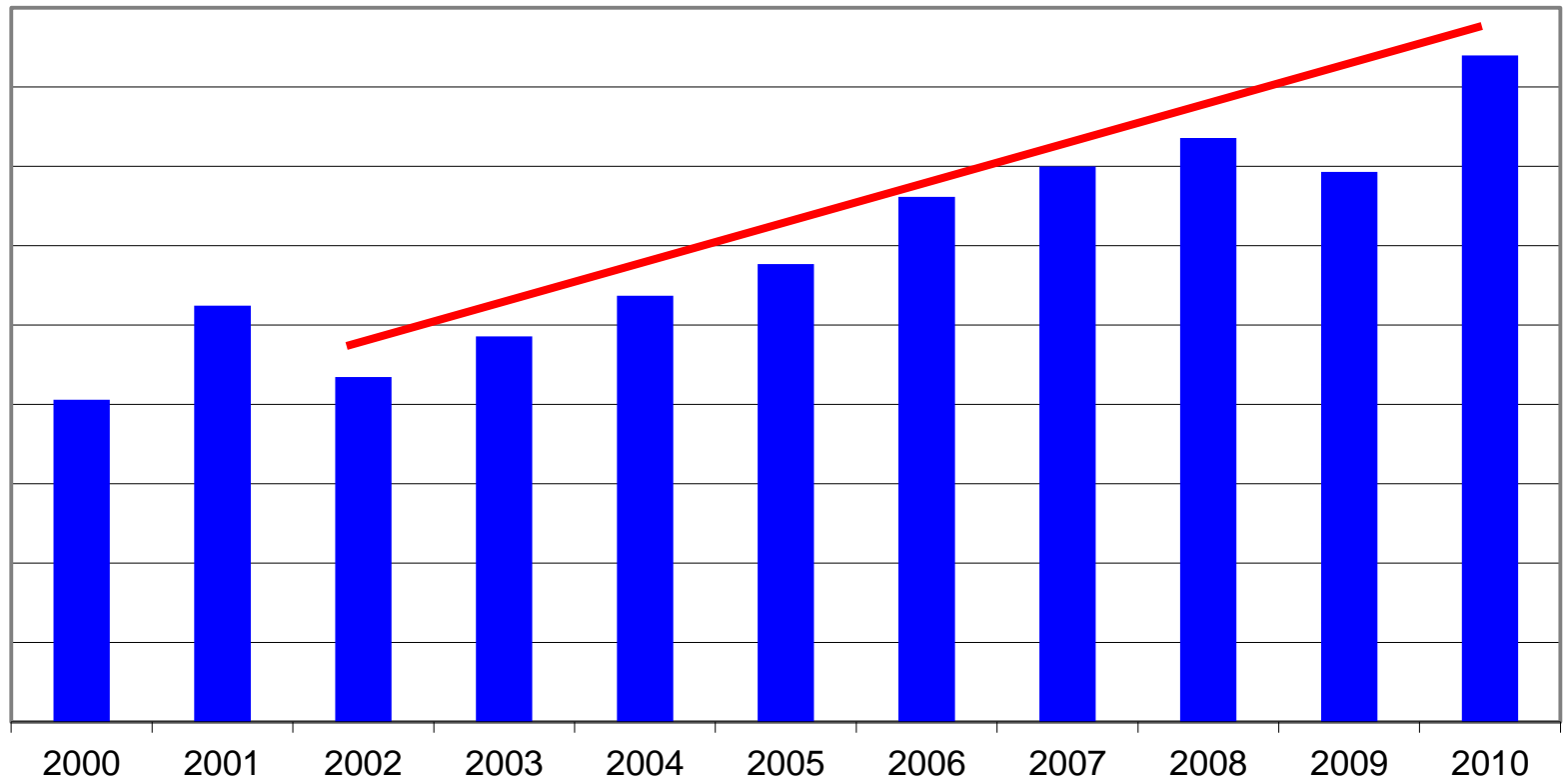
Early Summer Samples
Benson Lab (2001 to 2010)



Trends in Soil Sampling

Fall Samples

October - December
Benson Lab (2000- 2010)



Soil Sampling Projects in 2010

- Hand Probe - Wintex 1000 Comparison**
- Sample Depth Comparison**
- Sampling Date Comparison**
- Grid Sampling Orientation Comparison**

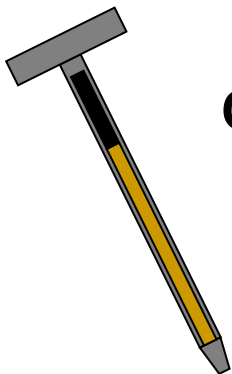
Wintex 1000

Comparison with Hand Probe

May 27, 2010

South of Granite Falls, MN

Cooperator: Brian Velde, Central Crop Consulting



In a planted soybean field
4 sampling points
12 soil cores/point

30-40' in length parallel to the bean row



Wintex 1000

Comparison with Hand Probe

	Phos-Olsen	
	Wintex	Hand
Point 1	38	40
Point 2	12	14
Point 3	24	24
Point 4	27	29
Average	25	27

Wintex 1000

Comparison with Hand Probe

	Phos-Bray 1	
	Wintex	Hand
Point 1	75	73
Point 2	-	-
Point 3	38	37
Point 4	43	46
Average	52	52

Wintex 1000

Comparison with Hand Probe

	pH	
	Wintex	Hand
Point 1	5.6	5.6
Point 2	8	8
Point 3	5.9	5.7
Point 4	5.8	5.6
Average	6.3	6.2

Wintex 1000

Comparison with Hand Probe

	Potassium	
	Wintex	Hand
Point 1	144	150
Point 2	155	153
Point 3	166	159
Point 4	138	144
Average	151	152

Wintex 1000

Comparison with Hand Probe

	pH	
	Wintex	Hand
Point 1	5.6	5.6
Point 2	8	8
Point 3	5.9	5.7
Point 4	5.8	5.6
Average	6.3	6.2

Wintex 1000

Comparison with Hand Probe

	OM	
	Wintex	Hand
Point 1	3.5	3.3
Point 2	4.1	4.1
Point 3	4.1	4
Point 4	3.9	4
Average	3.9	3.9

Wintex 1000

Comparison with Hand Probe

Summary:

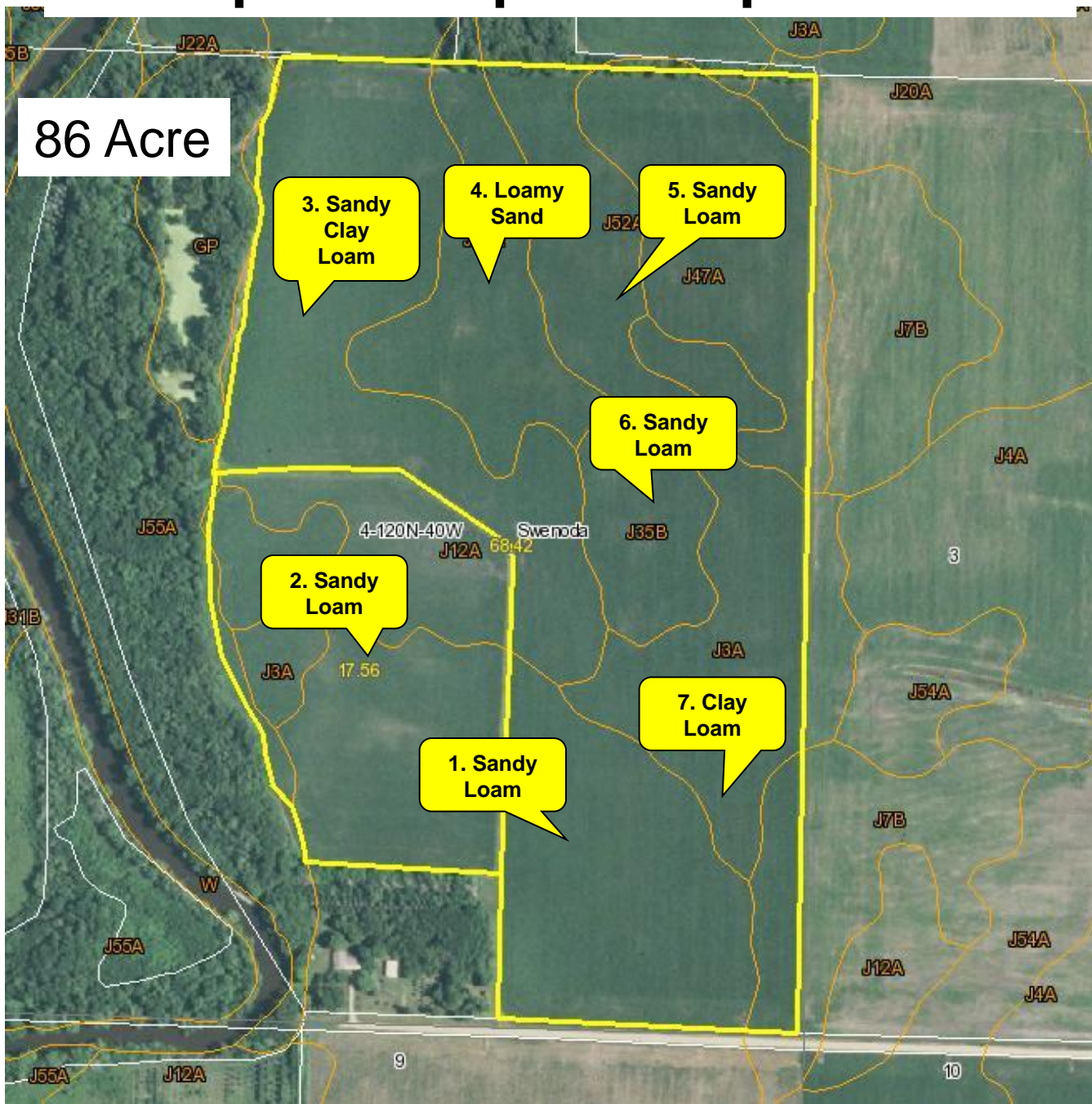
1. No difference in soil test values between the hand probe method and the Wintex 1000

Wintex 1000 Topsoil Sampler

- Increased Speed/Productivity
- Much less sampler fatigue
- Consistent sample depth
- Ease of use for all operators
- Minimal maintenance
- No probe lubrication
- Does NOT plug
- Durable construction
- Simple installation
- Works in all soil types
 - Sands to Clays



Top Soil Depth Comparison



Top Soil Depth Comparison

Average of 7 Sampling Points in a Soybean Field

Depth	Nitrate-N	Sulfur
inches	lbs/a	lbs/a
0 - 4	10	8
0 - 6	12	12
0 - 8	15	14
0 - 10	21	25

Top Soil Depth Comparison

Average of 7 Sampling Points in a Soybean Field

Depth	Phos-O	Phos-B1
inches	ppm	ppm
0 - 4	20	45
0 - 6	15	34
0 - 8	11	21
0 - 10	10	18

Top Soil Depth Comparison

Average of 7 Sampling Points in a Soybean Field

Depth	Potassium	Zinc
inches	ppm	ppm
0 - 4	122	1.5
0 - 6	120	1.3
0 - 8	101	1.1
0 - 10	98	0.9

Top Soil Depth Comparison

Average of 7 Sampling Points in a Soybean Field

Depth	pH	OM
inches		%
0 - 4	6.9	2.4
0 - 6	6.9	2.5
0 - 8	7.0	2.4
0 - 10	7.0	2.4

Stratification of Nutrients

Conventional Tillage

Depth	Phos-O	K ₂ O	OM	pH
inches	ppm	ppm	%	
0 - 2	30	164	3.5	6.5
2 - 4	16	115	3.5	6.6
4 - 6	6	83	3.3	6.8
6 - 8	3	63	3.3	7.1
8 - 10	4	69	3.1	7.3
10 - 12	2	68	2.9	7.4

SDSU: Brookings

Stratification of Nutrients

No-till Situation

Depth	Phos-O	K ₂ O	OM	pH
inches	ppm	ppm	%	
0-1	43	366	3.7	5.9
1-2	22	243	3.4	5.4
2-3	8	178	3.6	5.2
3-4	6	197	3.1	5.3
4-5	3	221	3.0	5.4
5-6	5	206	2.1	5.4

SDSU: Beresford

Top Soil Depth Comparison

Topsoil vs Subsoil (Mellette, SD)

Depth	Phos-O	K ₂ O	OM	pH	Salts
inches	ppm	ppm	%		
0-6	40	441	4.4	6.3	0.37
6-24	3	218	2.3	7.4	.61
0-6	22	392	4.1	6.2	.3
6-24	3	210	2.4	7.3	.6

Top Soil Depth Comparison

Summary:

1. Mobile nutrients (N & S):
Can increase or decrease as depth increases
2. Immobile nutrients (P, K & Zn):
P & Zn: Usually decreases as depth increases
K: Can increase or decrease as depth increases
3. pH: Can increase or decrease as depth increases
4. OM: Usually decreases as depth increases
5. Stratification of nutrients is more likely the less you till:

Consistency in sampling depth

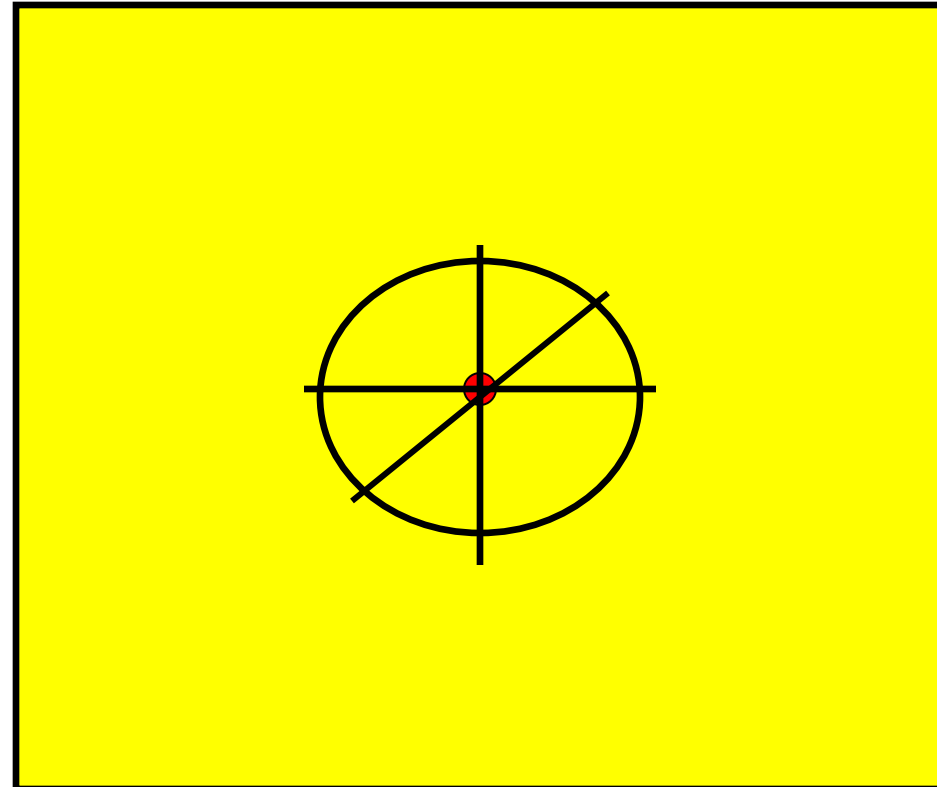
Grid Sample Orientation

Average of 14 Sample Points
In 3 Harvested Soybean Fields in 2010

-Grid sample orientation

- Circle the center point
- Parallel to the row
- Perpendicular to the row
- Diagonal to the row

-30-40' diameter at the
center point of the grid



Grid Sample Orientation

Average of 14 Sample Points
In 3 Harvested Soybean Fields in 2010

	Phos-O	Potassium
	ppm	ppm
Parallel	11	171
Perpendicular	11	177
Diagonal	11	178
Circle	11	169

Grid Sample Orientation

Average of 14 Sample Points
In 3 Harvested Soybean Fields in 2010

	Zinc	pH
	ppm	
Parallel	1.32	7.5
Perpendicular	1.36	7.5
Diagonal	1.38	7.5
Circle	1.31	7.5

Grid Sample Orientation

Average of 14 Sample Points
In 3 Harvested Soybean Fields in 2010

	OM	Salts
	%	mhos/cm
Parallel	4.2	0.38
Perpendicular	4.3	0.39
Diagonal	4.3	0.38
Circle	4.3	0.39

Grid Sample Orientation

Average of 14 Sample Points
In 3 Harvested Soybean Fields in 2010

Summary:

1. No difference in soil test values based upon the grid sample orientation.
2. Stay away from a band (starter or deep band) of applied P, K or Zn as this will erroneously elevate the soil test values.

Sample Date Comparison Spring vs Fall

2 soybean fields were sampled

Field 1: 14 points

Field 2: 7 points

Sampled twice:

- 1) After soybean emergence
- 2) After soybean harvest

Sample Date Comparison

Spring vs Fall

Average of combined data

		Early Summer	Post Harvest
Phos-Olsen (12 pts)	ppm	12	13
Phos-Bray 1 (9 pts)	ppm	29	29

Sample Date Comparison Spring vs Fall

Average of combined data

		Early Summer	Post Harvest
Potassium	ppm	91	92
Zinc	ppm	1.6	1.8

Sample Date Comparison Spring vs Fall

Average of combined data

		Early Summer	Post Harvest
pH		6.8	6.7
Organic Matter	%	5.7	4.5

Sample Date Comparison Spring vs Fall

Average of each field

Soil test averages per field in 2010.				
Field			Early Summer	Post Harvest
1	Phos-O (5 pts)	ppm	10	13.6
2	Phos-O (7 pts)	ppm	13	13
1	Phos-B1 (9 pts)	ppm	29	29

Sample Date Comparison Spring vs Fall

Average of each field

Soil test averages per field in 2010.				
Field			Early Summer	Post Harvest
1	Potassium	ppm	79	73
2	Potassium	ppm	116	130
1	Zinc	ppm	1.8	2.1
2	Zinc	ppm	1.3	1.3

Sample Date Comparison Spring vs Fall

Average of each field

Soil test averages per field in 2010.				
Field			Early Summer	Post Harvest
1	pH		6.8	6.6
2	pH		6.9	7
1	Organic Matter	%	7.3	5.6
2	Organic Matter	%	2.3	2.4

Sample Date Comparison Spring vs Fall

Summary:

1. No difference in soil test values when the 2 fields are combined together
2. Possible difference in P & K when the 2 fields are looked at separately
3. Next year to expand this project

Closing

2010 SCN Summary – www.agvise.com

2010 Soil Test Summary – www.agvise.com

Online Soil Sample Submission System
<http://submit.agvise.com>

Agvisor Gold: Web based version

New Online Soil Sample Submission System

Testing in Fall 2010 (~ 18,000 samples this fall)

- 1) Only 1 form instead of all the other ones
 - Conventional, Grid/Zone, SCN
- 2) Input your own Growers and Fields (database)
 - Correct SPELLING...
- 3) Default Settings
 - Crop Choice, Yield Goals, Guidelines, Previous Crop
- 4) **Laser Jet printer ONLY**...No inkjet printers
 - Print the bar-code reference number stickers
- 5) Sample data transmitted electronically to Agvise
 - No paperwork goes to Agvise

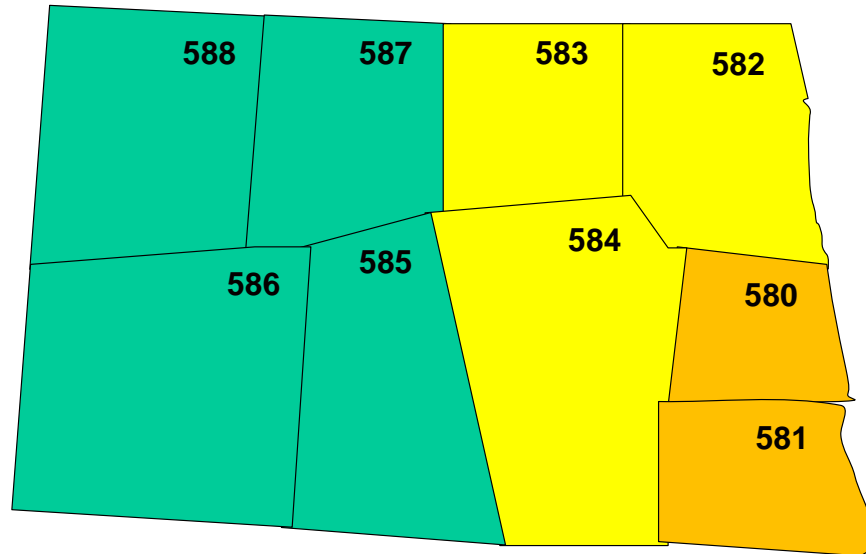
Online Soil Sample Submission New Form

	604 Highway 15 West, P.O. Box 510 Northwood, ND 58267 701-587-6010 • FAX 701-587-6013	902 13th Street North, P.O. Box 187 Benson, MN 56215 320-843-4109 • FAX 320-843-2074	FOR USE WITH LASER PRINTER ONLY DO NOT USE WITH INKJET PRINTER	
118644 JE0007 Richard Test Test 1 1 depth	DEEP SUB SOIL	SUB SOIL	TOP SOIL 118644  JE0007-Richard Test Test 1 1 depth	← 1 Depth
118645 JE0007 Richard Test Test 1 2 Depth	DEEP SUB SOIL	SUB SOIL 118645  JE0007-Richard Test Test 1 2 Depth	TOP SOIL 118645  JE0007-Richard Test Test 1 2 Depth	← 2 Depth
118646 JE0007 Richard Test Test 1 3 Depth	DEEP SUB SOIL 118646  JE0007-Richard Test Test 1 3 Depth	SUB SOIL 118646  JE0007-Richard Test Test 1 3 Depth	TOP SOIL 118646  JE0007-Richard Test Test 1 3 Depth	← 3 Depth
118647 JE0007 Richard Test Test 2 1	DEEP SUB SOIL	SUB SOIL	TOP SOIL 118647 SCN JE0007-Richard Test Test 2	← SCN

***Thank You
Have a
Great New Year***

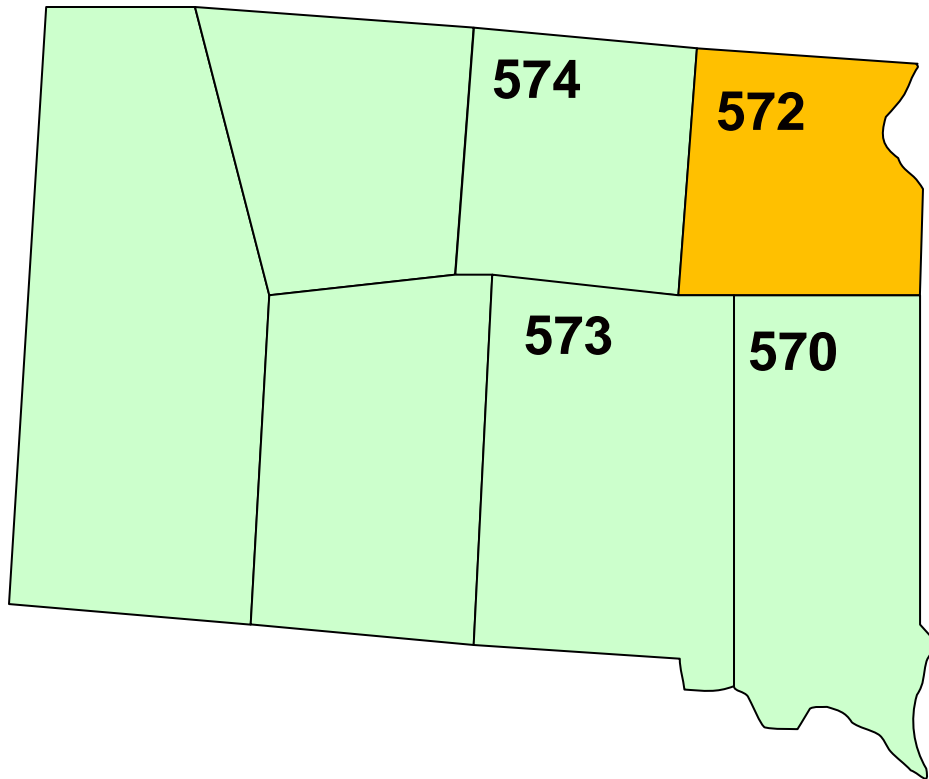


North Dakota 2010 SCN



Zip	Samples	Zero	1-200	201-2,000	2,000-10,000	>10,000
580 - 581	348	48%	28%	12%	9%	3%
582	2	100%				
583	8	100%				
584	11	73%	27%			

**South Dakota
2010 SCN by
Submitters Zip Code**



60 Samples

572

34% Zero

25% 1-200 eggs

18% 201-2,000

12% 2,001-10,000

0% >10,000

2010 SCN by Submitters Zip Code

565

347 Samples

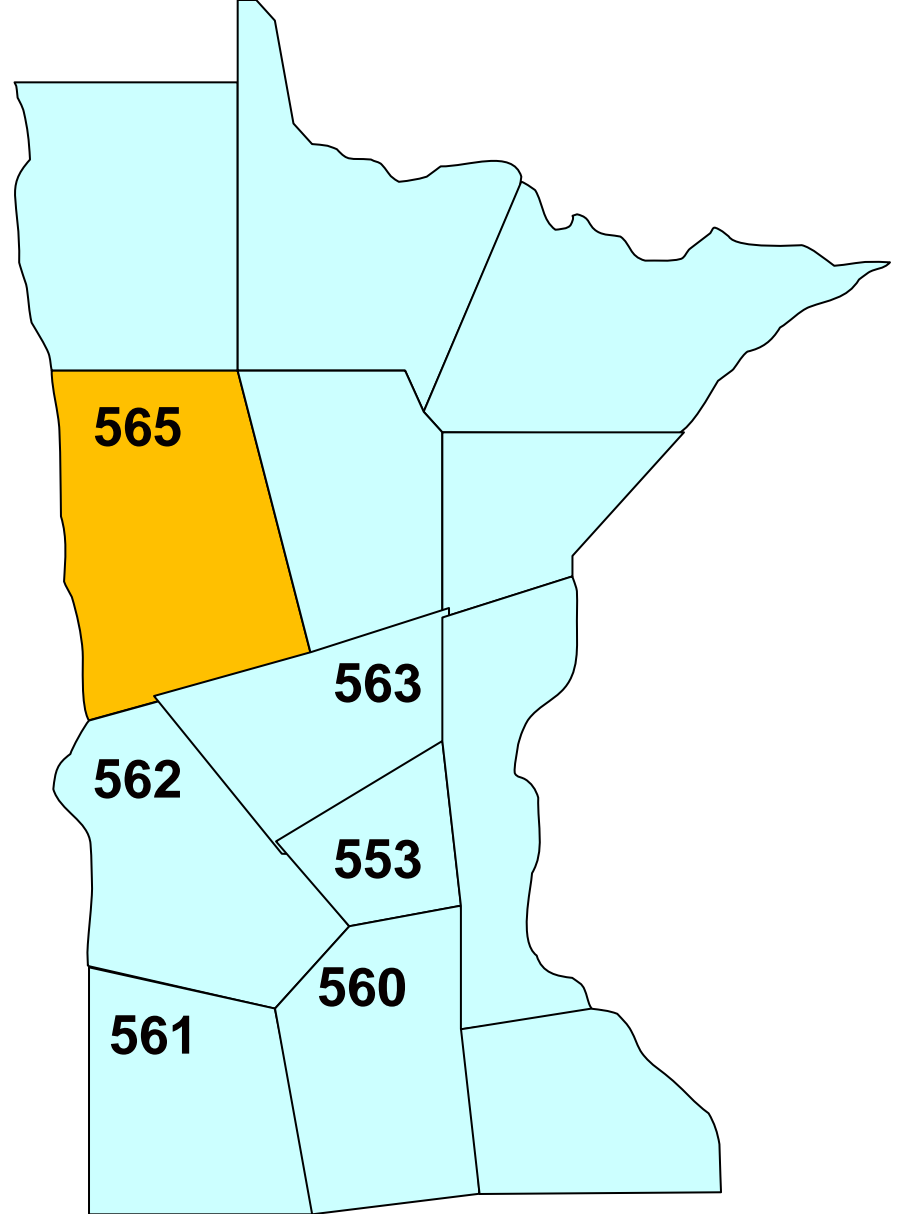
33% Zero

24% 1-200 eggs

27% 201-2,000

14% 2,001-10,000

2% >10,000



2010 SCN by Submitters Zip Code

567

5 Samples

60% Zero

40% 1-200 eggs

0% 201-2,000

0% 2,001-10,000

0% >10,000

