

Due to banding fertilizer over the last few years, I am concerned that my soil sample results could be influenced by a core being taken from one of these bands.

Sample ID	Soil Test 98 Bray P1 ppm	Calculated STP	Soil Test 03 Bray P1 ppm
1	17	18.80	29
2	23	24.27	24
3	27	28.41	62
4	21	22.73	34
5	20	21.62	24
6	14	15.55	30
7	17	18.98	32
8	17	17.82	19
9	13	14.01	21
10	25	26.66	22
11	14	15.51	29
12	12	13.87	23
13	17	18.39	16
14	21	22.14	24
15	20	21.94	22
16	30	32.02	35
17	20	21.75	20
18	26	26.96	14
19	26	27.07	56
20	26	26.83	23
21	13	15.01	22
22	16	17.88	31
23	11	12.18	20
24	10	11.72	38
25	5	9.89	13
26	5	5.91	13
27	5	9.80	13

Calculated STP =
98 STP +
Excess P / 18

- Does tillage break up and mix up these bands, giving more predictable and accurate soil test results?

- This field was disked and chisel plowed after wheat harvest. In September the grid points were resampled. Yields were determined from yield maps, an average of 13 to 19 recordings around each point (50' radius). The removal rates of 0.5# for wheat, 0.4# for milo, 0.8# for soybeans were used. The 03 and 04 results are then compared .

Sample ID	Soil Test 98 Bray P1 ppm	Calculated STP	Soil Test 04 Bray P1 ppm
1	17	17.80	14
2	23	22.46	14
3	27	27.35	20
4	21	21.83	16
5	20	20.83	12
6	14	14.77	11
7	17	17.62	17
8	17	16.03	20
9	13	12.63	15
10	25	25.55	12
11	14	14.60	21
12	12	12.58	20
13	17	17.09	12
14	21	21.08	24
15	20	21.19	14
16	30	31.16	18
17	20	20.37	15
18	26	24.80	11
19	26	25.34	34
20	26	25.32	25
21	13	13.86	8
22	16	16.61	11
23	11	11.22	9
24	10	10.91	3
25	5	8.80	10
26	5	4.82	11
27	5	8.92	27

Calculated STP =
98 STP +
Excess P / 18

Three methods were used to predict the results.

- 1) Assign the average of all STP taken in 1998 to each point of the samples taken in 2003 & 2004.
- 2) Assign the same STP of the 1998 samples to each point of the 2003 & 2004 samples.
- 3) Calculate soil test P
1998 STP + (excess P / transformation rate).

Sample	Soil Test	Soil Test	meth1 pred 03	meth2 pred 03	meth3 pred 03	meth1 error	meth2 error	meth3 error	meth1 sqr error	meth2 sqr error	meth3 sqr error
	July-98 Bray P1	Apr of 03 Bray P1									
ID	ppm	ppm	use 98 avg	use 98	with remov						
1	17	29	17.4	17.0	19.15	11.56	12.00	9.85	133.53	144.00	97.04
2	23	24	17.4	23.0	24.66	6.56	1.00	-0.66	42.98	1	0.43
3	27	62	17.4	27.0	28.79	44.56	35.00	33.21	1985.20	1225	1102.82
4	21	34	17.4	21.0	23.09	16.56	13.00	10.91	274.09	169	118.93
5	20	24	17.4	20.0	21.98	6.56	4.00	2.02	42.98	16	4.09
6	14	30	17.4	14.0	15.90	12.56	16.00	14.10	157.64	256	198.82
7	17	32	17.4	17.0	19.32	14.56	15.00	12.68	211.86	225	160.88
8	17	19	17.4	17.0	18.24	1.56	2.00	0.76	2.42	4	0.58
9	13	21	17.4	13.0	14.42	3.56	8.00	6.58	12.64	64	43.30
10	25	22	17.4	25.0	27.03	4.56	-3.00	-5.03	20.75	9	25.31
11	14	29	17.4	14.0	15.89	11.56	15.00	13.11	133.53	225	171.97
12	12	23	17.4	12.0	14.22	5.56	11.00	8.78	30.86	121	77.10
13	17	16	17.4	17.0	18.77	-1.44	-1.00	-2.77	2.09	1	7.69
14	21	24	17.4	21.0	22.55	6.56	3.00	1.45	42.98	9	2.11
15	20	22	17.4	20.0	22.28	4.56	2.00	-0.28	20.75	4	0.08
16	30	35	17.4	30.0	32.36	17.56	5.00	2.64	308.20	25	6.96
17	20	20	17.4	20.0	22.10	2.56	0.00	-2.10	6.53	0	4.43
18	26	14	17.4	26.0	27.37	-3.44	-12.00	-13.37	11.86	144	178.70
19	26	56	17.4	26.0	27.25	38.56	30.00	28.75	1486.53	900	826.51
20	26	23	17.4	26.0	27.03	5.56	-3.00	-4.03	30.86	9	16.25
21	13	22	17.4	13.0	15.17	4.56	9.00	6.83	20.75	81	46.70
22	16	31	17.4	16.0	18.00	13.56	15.00	13.00	183.75	225	169.06
12	11	20	17.4	11.0	12.35	2.56	9.00	7.65	6.53	81	58.46
24	10	38	17.4	10.0	11.91	20.56	28.00	26.09	422.53	784	680.86
25	5	13	17.4	5.0	10.10	-4.44	8.00	2.90	19.75	64	8.38
26	5	13	17.4	5.0	6.10	-4.44	8.00	6.90	19.75	64	47.60
27	5	13	17.4	5.0	10.00	-4.44	8.00	3.00	19.75	64	9.02
27 points	17	26.26	17.4	17	19.48	8.81	8.81	6.78	77.70	77.70	45.92
12 points	20	26.50	20	20	21.36	7.00	7.00	5.14	49.00	49.00	26.42
9 points	21	29.22	21	21	22.36	8.67	8.67	6.86	75.11	75.11	47.09
6 points	9	21.33	9	21	11.41	12.67	0.78	9.92	160.44	0.60	98.47

Sample	Soil Test	Soil Test	meth1 pred 04 use 98 avg	meth2 pred 04 use 98	meth3 pred 04 with remov	meth1 error	meth2 error	meth3 error	meth1 sqr error	meth2 sqr error	meth3 sqr error	
	July-98 Bray P1	Sept 04 Bray P1										
ID	ppm	ppm										
1	17	14	17.4	17.0	18.35	-3.44	-3.00	-4.35	11.86	9.00	18.94	
2	23	14	17.4	23.0	23.12	-3.44	-9.00	-9.12	11.86	81.00	83.09	
3	27	20	17.4	27.0	27.94	2.56	-7.00	-7.94	6.53	49.00	63.05	
4	21	16	17.4	21.0	22.39	-1.44	-5.00	-6.39	2.09	25.00	40.87	
5	20	12	17.4	20.0	21.38	-5.44	-8.00	-9.38	29.64	64.00	88.02	
6	14	11	17.4	14.0	15.31	-6.44	-3.00	-4.31	41.53	9.00	18.55	
7	17	17	17.4	17.0	18.19	-0.44	0.00	-1.19	0.20	0.00	1.41	
8	17	20	17.4	17.0	16.72	2.56	3.00	3.28	6.53	9.00	10.76	
9	13	15	17.4	13.0	13.26	-2.44	2.00	1.74	5.98	4.00	3.01	
10	25	12	17.4	25.0	26.13	-5.44	-13.00	-14.13	29.64	169.00	199.57	
11	14	21	17.4	14.0	15.17	3.56	7.00	5.83	12.64	49.00	33.95	
12	12	20	17.4	12.0	13.16	2.56	8.00	6.84	6.53	64.00	46.80	
13	17	12	17.4	17.0	17.71	-5.44	-5.00	-5.71	29.64	25.00	32.55	
14	21	24	17.4	21.0	21.69	6.56	3.00	2.31	42.98	9.00	5.33	
15	20	14	17.4	20.0	21.72	-3.44	-6.00	-7.72	11.86	36.00	59.55	
16	30	18	17.4	30.0	31.70	0.56	-12.00	-13.70	0.31	144.00	187.62	
17	20	15	17.4	20.0	20.95	-2.44	-5.00	-5.95	5.98	25.00	35.45	
18	26	11	17.4	26.0	25.44	-6.44	-15.00	-14.44	41.53	225.00	208.41	
19	26	34	17.4	26.0	25.72	16.56	8.00	8.28	274.09	64.00	68.60	
20	26	25	17.4	26.0	25.71	7.56	-1.00	-0.71	57.09	1.00	0.50	
21	13	8	17.4	13.0	14.17	-9.44	-5.00	-6.17	89.20	25.00	38.03	
22	16	11	17.4	16.0	16.90	-6.44	-5.00	-5.90	41.53	25.00	34.76	
12	11	9	17.4	11.0	11.54	-8.44	-2.00	-2.54	71.31	4.00	6.45	
24	10	3	17.4	10.0	11.21	-14.44	-7.00	-8.21	208.64	49.00	67.48	
25	5	10	17.4	5.0	9.16	-7.44	5.00	0.84	55.42	25.00	0.71	
26	5	11	17.4	5.0	5.17	-6.44	6.00	5.84	41.53	36.00	34.05	
27	5	27	17.4	5.0	9.24	9.56	22.00	17.76	91.31	484.00	315.37	
27												
Average	17	15.70	17.4	17.4	18.49	-1.74	-1.74	-2.78	3.03	3.03	7.74	
Zone 1	12 points	20	16.42	19.5	19.5	20.32	-3.08	-3.08	-3.90	9.51	9.51	15.20
Zone 2	9 points	21	17.33	20.6	20.6	21.35	-3.22	-3.22	-4.01	10.38	10.38	16.12
Zone 3	6 points	9	11.83	8.7	8.7	10.54	3.17	3.17	1.30	10.03	10.03	1.68

03 analysis of field average and management zones using a transformation rate of 18

	STP 98	STP 03	meth 1	meth 2	meth 3	me 1	me 2	me 3	rmse 1	rmse 2	rmse 3
Average	17	26.26	17.44	17.44	19.48	8.81	8.81	6.78	14.47	13.49	12.27
Zone 1	20	26.5	17.44	19.50	21.36	9.06	7.00	5.14	15.26	13.16	12.19
Zone 2	21	29.22	17.44	20.56	22.36	11.78	8.67	6.86	15.58	13.14	12.05
Zone 3	9	21.33	17.44	8.67	11.41	3.89	12.67	9.92	10.58	14.62	12.74

Analysis of 04 using 18 as the transformation rate

	STP 98	STP 04	meth 1	meth 2	meth 3	me 1	me 2	me 3	rsme 1	rsme 2	rsme 3
Average	17	16	17.44	17.44	18.49	-1.74	-1.74	-2.78	6.74	7.96	7.94
Zone 1	20	16	17.44	19.50	20.32	-1.03	-3.08	-3.90	4.08	7.07	7.49
Zone 2	21	17	17.44	20.56	21.35	-0.11	-3.22	-4.01	7.59	7.36	7.97
Zone 3	9	12	17.44	8.67	10.54	-5.61	3.17	1.30	9.22	10.19	8.74

Compares method 3 for years 03 & 04 using transformation rate of 18

	STP 98	STP 03	meth 3	rsme 3
Average	17	26.26	19.48	12.27
Zone 1	20	26.5	21.36	12.19
Zone 2	21	29.22	22.36	12.05
Zone 3	9	21.33	11.41	12.74

	STP 98	STP 04	meth 3	rsme 3
Average	17	16	18.49	7.94
Zone 1	20	16	20.32	7.49
Zone 2	21	17	21.35	7.97
Zone 3	9	12	10.54	8.74

- It appears that the tillage has made the results of soil test more accurate.
- Let's see if the accuracy can be improved by adjusting the transformation rates.

The transformation rate that minimizes the rsme turns out to be 4.95

	STP 98	STP 03	meth 1	meth 2	meth 3	me 1	me 2	me 3	rsme 1	rsme 2	rsme 3
Average	17	26.26	17.44	17.44	24.86	8.81	8.81	1.40	14.47	13.49	10.76
Zone 1	20	26.5	17.44	19.50	26.26	9.06	7.00	0.24	15.26	13.16	10.89
Zone 2	21	29.22	17.44	20.56	27.12	11.78	8.67	2.10	15.58	13.14	10.28
Zone 3	9	21.33	17.44	8.67	18.64	3.89	12.67	2.69	10.58	14.62	11.19

We find for 04 the transformation rate that minimizes the rmse is 32.73

	STP 98	STP 04	meth 1	meth 2	meth 3	me 1	me 2	me 3	rmse 1	rmse 2	rmse 3
Average	17	16	17.44	17.44	18.02	-1.74	-1.74	-2.31	6.74	7.96	7.91
Zone 1	20	16	17.44	19.50	19.95	-1.03	-3.08	-3.53	4.08	7.07	7.28
Zone 2	21	17	17.44	20.56	20.99	-0.11	-3.22	-3.66	7.59	7.36	7.68
Zone 3	9	12	17.44	8.67	9.69	-5.61	3.17	2.14	9.22	10.19	9.34

Transformation Rate 18					Transformation Rate 4.95 32.73				
	STP	STP	meth	rsme		STP	STP	meth	rmse
	98	03	3	3		98	03	3	3
Average	17	26.26	19.48	12.27	Average	17	26.26	24.86	10.76
Zone 1	20	26.5	21.36	12.19	Zone 1	20	26.5	26.26	10.89
Zone 2	21	29.22	22.36	12.05	Zone 2	21	29.22	27.12	10.28
Zone 3	9	21.33	11.41	12.74	Zone 3	9	21.33	18.64	11.19
	STP	STP	meth	rsme		STP	STP	meth	rmse
	98	04	3	3		98	04	3	3
Average	17	16	18.49	7.94	Average	17	16	18.02	7.91
Zone 1	20	16	20.32	7.49	Zone 1	20	16	19.95	7.28
Zone 2	21	17	21.35	7.97	Zone 2	21	17	20.99	7.68
Zone 3	9	12	10.54	8.74	Zone 3	9	12	9.69	9.34

- It appears that method 3 does give me an educated guess at what the P level is for a point or a management zone.