

Rao, R., J.J. Schell, Q.M. Ketterings, and H. Krol (2007). Schoharie Soil Sample Survey (2002-2006). CSS Extension Bulletin E07-55. 22 pages.

Soil Sample Survey

Schoharie County

Samples analyzed by CNAL (2002-2006)



Schoharie County (Photo credit: J.J. Schell, CCE of Schoharie County).

Summary compiled by

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Cornell Nutrient Analysis Laboratory
<http://www.css.cornell.edu/soiltest/newindex.asp>

&
Nutrient Management Spear Program
<http://nmisp.css.cornell.edu/>



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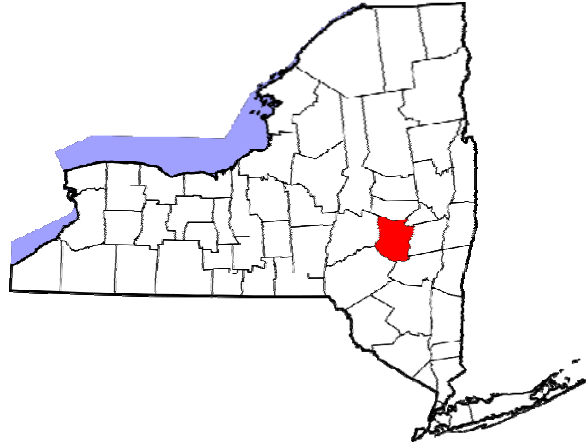
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Schoharie County (Photo credit: J.J. Schell, CCE of Schoharie County).

1. County Introduction

Schoharie County is located in eastern New York south of the Mohawk Valley. The County is rural in nature with a strong agricultural and tourism base. Topography consists of rolling hills and flat lands covering approximately six hundred square miles. In the western part of this county is the dividing ridge between the waters of the Mohawk and those of the Susquehanna and Delaware. In the eastern part it has the Catskill and Helleberg mountains. It has the valley of the Schoharie creek north and south through its center, along which the alluvial flats are very extensive, with a soil of loam and vegetable mould, peculiarly rich and fertile. Much of the surface of this



county is hilly, with some of a mountainous character. The soil of the uplands is of various qualities, generally better adapted to grass than to grain. The Schoharie creek, a large tributary of the Mohawk, has its rise in Greene county, and flows northward through the center of this county. In its course it receives several smaller streams, the principal of which are the Cobleskill on the west, and Fox creek on the east. The Catskill has its source in the eastern part of the county, and the Delaware and Susquehanna in the western part. The population is 33,263 and is concentrated predominantly in the Villages of Cobleskill, Schoharie, Middleburgh, Sharon Springs, and Richmondville, all in the northern half of the County. In 2003, there were 112,600 acres in farms, 28% of the county's total 398,094 acres. There were 575 farms in the county averaging 196 acres per farm. Schoharie County ranks 35th in the state for number of farms and 33rd for land in farms. In 2002, according to the Census of Agriculture, the market value of all agricultural products sold from county farms was \$27.0 million. Total sales averaged \$46,596 per farm. The leading products sold were dairy products, hay and other crops, cattle and calves, vegetables, and grains and dry beans.

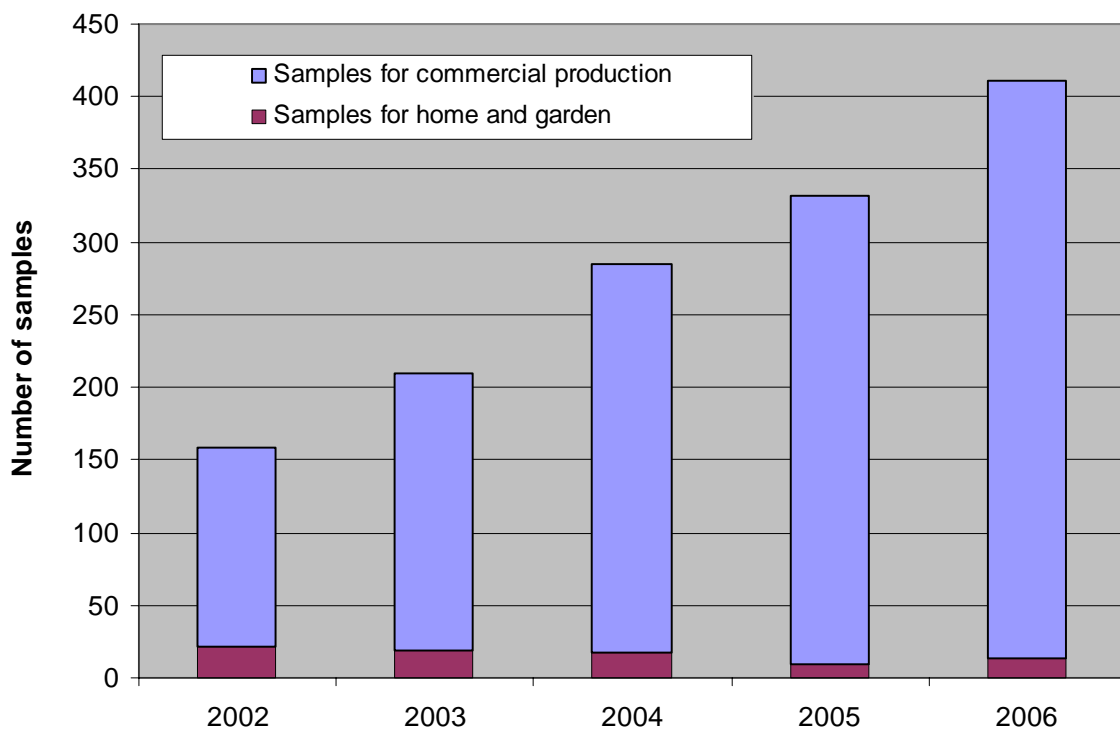
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Sources: (1) www.usgennet.org/usa/ny/state/orphan/schoharie.htm, (2) New York State Agriculture Statistics Service and (3) Schoharie County Chamber of Commerce.

2. General Survey Summary

This survey summarizes the soil test results from grower (identified as “commercial samples”) and homeowner samples from Schoharie County submitted to the Cornell Nutrient Analysis Laboratory (CNAL) from 2002 to 2006. The total number of samples analyzed in these years amounted to 1397. Of these, 1316 samples (94%) were submitted by commercial growers while 81 samples (6%) were submitted by homeowners. The number of samples has increased over the years.



Homeowners		Commercial		Total
2002	21	2002	138	159
2003	19	2003	191	210
2004	17	2004	268	285
2005	10	2005	322	332
<u>2006</u>	<u>14</u>	<u>2006</u>	<u>397</u>	<u>411</u>
Total	81	Total	1316	1397

Homeowners submitted soil samples to the Cornell Nutrient Analysis Laboratory during 2002-2006 primarily to request fertilizer recommendations for home garden vegetable production (47%) or lawns (19%). Commercial growers submitted samples primarily to grow alfalfa or alfalfa/grass mixes (33%), corn silage or grain (27%), and grass hay production (24%).

Soils tested for home and garden in Schoharie County were classified as belonging to soil management group 2 (26%), group 3 (19%), group 4 (47%), or group 5 (9%). A description of the different management groups is given below.

Soil Management Groups for New York

1	Fine-textured soils developed from clayey lake sediments and medium- to fine-textured soils developed from lake sediments.
2	Medium- to fine-textured soils developed from calcareous glacial till and medium-textured to moderately fine-textured soils developed from slightly calcareous glacial till mixed with shale and medium-textured soils developed in recent alluvium.
3	Moderately coarse textured soil developed from glacial outwash and recent alluvium and medium-textured acid soil developed on glacial till.
4	Coarse- to medium-textured soils formed from glacial till or glacial outwash.
5	Coarse- to very coarse-textured soils formed from gravelly or sandy glacial outwash or glacial lake beach ridges or deltas.
6	Organic or muck soils with more than 80% organic matter.

Of the samples submitted by commercial growers, the majority (74%) belonged to soil management group 2. There were no group 5 or 6 samples and less than 1% belonged to group 4. Group 1 soils were represented by 9% of the samples while 16% were from soil management group 3. Mohawk was the most common soil series (25% of all samples), followed by Darien (19%), Honeoye (11%), Schoharie (8%) and Lansing (7%).

Organic matter levels, as measured by loss-on-ignition, ranged from less than 1% to greater than 30%. For homeowners 33% had between 2 and 4% organic matter versus 46% for samples submitted by commercial growers.

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Soil pH in water (1:1 soil:water extraction ratio) varied from 4.7 to 8.0 for home and garden samples while 40% tested between pH 6 and 7. For the commercial samples, the highest pH was 8.1 and 69% tested between pH 6 and 7.

Extractable nutrients such as phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca), iron (Fe), manganese (Mn), and zinc (Zn) were measured using the Morgan method (Morgan, 1941). This solution contains sodium acetate buffered at pH of 4.8.

Soil test P levels of <1 lb P/acre are classified as very low. Between 1-3 lbs P/acre is low. Medium is between 4-8 lbs P/acre. High testing soils have P levels between 9 and 39 lbs P/acre and anything higher is classified as very high. For homeowners, 14% of the soils tested low for P, 28% tested medium, 19% tested high and 40% tested very high. This meant that 58% tested high or very high in P. For commercial growers, 5% tested very high. In total 49% were low in P, 24% tested medium for P while 22% of the submitted samples were classified as high in soil test P. This means that 27% tested high or very high in P.

Classifications for K depend on soil management group. The fine textured soils (soil management group 1) have a greater K supplying capacity than the coarse textured sandy soils (soil management group 5). Classification for each of the management groups in the above table represent very low, low, medium, high and very high. So for example for soil management group 5 and 6, <60 lbs K/acre means the soil is very low in K, between 60 and 114 lbs K/acre is medium, 115-164 lbs K/acre is medium, 165-269 lbs K/acre is high and >269 lbs K/acre is classified as very high (see Table below).

Soil Management Group	Potassium Soil Test Value (Morgan extraction in lbs K/acre)				
	Very low	Low	Medium	High	Very High
1	<35	35-64	65-94	95-149	>149
2	<40	40-69	70-99	100-164	>164
3	<45	45-79	80-119	120-199	>199
4	<55	55-99	100-149	150-239	>239
5 and 6	<60	60-114	115-164	165-269	>269

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Potassium classifications for Schoharie County soils varied from very low (4% of the homeowner soils and just one commercial grower sample) to very high (59% of the homeowner soils and 27% of the commercial growers' soils). For homeowners, 4% tested low in K, 11% tested medium, and 22% tested high for potassium. For commercial growers' soils, 8% tested low, 27% tested medium and 37% tested high in K.

Soils test very low for Mg if Morgan extractable Mg is less than 20 lbs Mg/acre. Low testing soils have 20-65 lbs Morgan Mg per acre. Soils with 66-100 lbs Mg/acre test medium for Mg. High testing soils have 101-199 lbs Mg/acre while soils with more than 200 lbs Mg/acre in the Morgan extraction are classified as very high in Mg. Magnesium levels ranged from 35 to almost 1800 lbs Mg/acre. There were no samples that tested very low for Mg. Most soils tested high or very high for Mg (96% of the homeowner soils and 97% of the soils of the commercial growers).

Soils with more than 50 lbs Morgan extractable Fe per acre test excessive for Fe. Anything lower than 50 lbs Fe/acre is considered normal. Iron levels ranged from 93-98% in the normal range with 7% of the homeowner soils and 2% of the commercial grower soils testing excessive for Fe. Similarly, most soils (95-98%) tested normal for manganese. Soils with more than 100 lbs Morgan extractable Mn per acre are classified as excessive in Mn. Anything less than 100 lbs Mn per acre is classified as normal. Soils with less than 0.5 lb Zn per acre in the Morgan extraction are classified as low in Zn. Medium testing soils have between 0.5 and 1 lb of Morgan extractable Zn per acre. If more than 1 lb of Zn/acre is extracted with the Morgan solution, the soil tests high in Zn. For the homeowner soils, 89% tested high for Zn while 9% tested medium and 2% were low in Zn. Of the commercial growers' samples, 17% tested low, 45% tested medium while 38% were high in Zn.

In the following sections, the summary tables for each of the soil fertility indicators described above are given. The appendix contains the crop codes used in section 3.

3. Cropping Systems

3.1 Homeowner Samples

Crops for which recommendations are requested by homeowners:

	2002-2006	%
ALG	3	4
APP	1	1
APR	2	2
BLU	4	5
GRA	1	1
LAW	15	19
MVG	38	47
OTH	2	2
PER	4	5
ROS	1	1
SAG	6	7
TRF	3	4
Unknown	1	1
Total	81	100

Note: See Appendix for Cornell crop codes.

3.2 Commercial Samples

Crops for which recommendations are requested in commercial samples:

Current year crop	2002	2003	2004	2005	2006	Total	%
ABE/ABT	5	0	1	0	0	6	0
AGE/AGT	38	74	62	123	128	425	32
ALE/ALT	5	1	2	2	0	10	1
BCT	2	5	3	0	0	10	1
BGE	0	0	3	0	0	3	0
BLB	0	0	0	1	0	1	0
BSS	5	2	0	0	0	7	1
BUK	0	0	0	0	1	1	0
CGE/CGT	6	3	4	18	7	38	3
CLE/CLT	0	4	2	3	0	9	1
COG/COS	34	52	50	93	122	351	27
ELD	0	0	1	0	0	1	0
GIE/GIT	2	0	3	0	16	21	2
GRE/GRT	31	25	105	57	75	293	22
HRB	0	0	0	1	0	1	0
IDL	0	2	1	2	0	5	0
MIX	0	2	0	0	3	5	0
OAS	2	0	2	2	9	15	1
OAT	1	0	2	0	1	4	0
OTH	3	9	6	5	3	26	2
PCH	0	1	0	0	0	1	0
PGE/PGT	0	0	1	3	1	5	0
PIE/PIT	0	0	1	0	12	13	1
PLE/PLT	1	3	0	0	6	10	1
PNT	1	3	10	9	10	33	3
RYC	1	0	3	0	0	4	0
SOY	0	1	0	0	1	2	0
SSH	0	4	0	1	0	5	0
SUD	0	0	6	0	0	6	0
SUN	0	0	0	1	0	1	0
SWC	0	0	0	1	1	2	0
Unknown	1	0	0	0	1	2	0
Total	138	191	268	322	397	1316	100

Note: See Appendix for Cornell crop codes.

4. Soil Types

4.1 Homeowner Samples

Soil types (soil management groups) for homeowner samples:

	2002-2006	%
SMG 1 (clayey)	0	0
SMG 2 (silty)	21	26
SMG 3 (silt loam)	15	19
SMG 4 (sandy loam)	38	47
SMG 5 (sandy)	7	9
SMG 6 (mucky)	0	0
Total	81	100

4.2 Commercial Samples

Soil series for commercial samples:

Name	SMG	2002	2003	2004	2005	2006	Total	%
Alluvial Land	3	0	1	3	0	1	5	0
Appleton	2	2	2	0	4	8	16	1
Arnot	3	0	1	1	0	0	2	0
Barbour	3	5	5	38	6	16	70	5
Basher	3	4	0	2	2	10	18	1
Burdett	2	1	8	0	10	3	22	2
Chadakoin	3	0	0	0	0	1	1	0
Chippewa	3	0	1	2	0	0	3	0
Conesus	2	0	0	0	0	1	1	0
Darien	2	38	39	43	72	56	248	19
Fredon	4	1	0	0	2	0	3	0
Honeoye	2	19	7	30	43	45	144	11
Howard	3	0	0	0	0	3	3	0
Ilion	2	2	5	1	8	13	29	2
Lakemont	1	7	4	0	5	6	22	2
Lansing	2	1	6	13	10	64	94	7
Lewbeach	3	0	1	0	0	0	1	0
Lima	2	8	0	0	0	0	8	1
Lordstown	3	3	1	8	4	0	16	1
Mardin	3	4	3	4	12	3	26	2
Mohawk	2	19	49	65	101	89	323	25
Morris	3	0	0	0	1	0	1	0
Nassau	4	0	0	0	1	0	1	0
Nunda	2	8	12	7	30	16	73	6
Odessa	2	1	1	3	2	3	10	1
Oquaga	3	0	3	0	0	0	3	0
Phelps	3	3	4	0	3	6	16	1
Schoharie	1	10	24	17	3	46	100	8
Scio	3	1	0	0	0	0	1	0
Tioga	3	0	1	0	0	0	1	0
Tunkhannock	3	0	1	5	3	4	13	1
Venango	3	0	1	0	0	0	1	0
Volusia	3	0	4	5	0	1	10	1
Wayland	2	0	0	4	0	2	6	0
Wellsboro	3	0	5	7	0	0	12	1
Willowemoc	3	0	2	0	0	0	2	0
Unknown	-	1	0	10	0	0	11	1
Total	-	138	191	268	322	397	1316	100

5. Organic Matter

5.1 Homeowner Samples

Organic matter (loss-on-ignition method) in homeowner samples (number):

	<1	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	>6.9	Total
Number	3	2	11	16	9	16	5	19	81
Percentage	4	2	14	20	11	20	6	23	100

	2002-2006
Lowest:	0.4
Highest:	31.3
Mean:	8.9
Median:	4.8

5.2 Commercial Samples

Organic matter (loss-on-ignition method) in commercial samples (number):

	<1	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	>6.9	Total
2002	0	1	4	55	44	25	5	4	138
2003	0	1	4	75	58	34	9	10	191
2004	0	2	14	66	72	72	32	10	268
2005	0	0	10	112	139	44	13	4	322
2006	2	6	58	206	87	31	3	4	397
Total	2	10	90	514	400	206	62	32	1316

	2002	2003	2004	2005	2006
Lowest:	1.1	1.9	1.7	2.3	0.7
Highest:	10.3	9.3	9.6	8.8	16.4
Mean:	4.3	4.5	4.7	4.3	3.7
Median:	4.1	4.1	4.7	4.2	3.6

Organic matter in commercial samples (% of total number of samples):

	<1	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	>6.9	Total
2002	0	1	3	40	32	18	4	3	100
2003	0	1	2	39	30	18	5	5	100
2004	0	1	5	25	27	27	12	4	100
2005	0	0	3	35	43	14	4	1	100
2006	1	2	15	52	22	8	1	1	100
Total	0	1	7	39	30	16	5	2	100

6. pH

6.1 Homeowner Samples

pH of homeowner samples (numbers):

	<4.5	4.5-4.9	5.0-5.4	5.5-5.9	6.0-6.4	6.5-6.9	7.0-7.4	7.5-7.9	8.0-8.4	>8.4	?	Total
#	0	2	6	9	14	18	23	7	1	0	1	81
%	0	2	7	11	17	22	28	9	1	0	1	100

	2002-2006
Lowest:	4.7
Highest:	8.0
Mean:	-
Median:	6.7

6.2 Commercial Samples

pH of commercial samples (number):

	<4.5	4.5-4.9	5.0-5.4	5.5-5.9	6.0-6.4	6.5-6.9	7.0-7.4	7.5-7.9	8.0-8.4	>8.4	Total
2002	0	0	8	21	46	44	18	1	0	0	138
2003	0	1	5	29	58	76	22	0	0	0	191
2004	0	0	6	55	107	75	21	3	1	0	268
2005	0	0	10	59	101	116	34	2	0	0	322
2006	0	0	6	39	114	175	57	6	0	0	397
Total	0	1	35	203	426	486	152	12	1	0	1316

	2002	2003	2004	2005	2006
Lowest:	5.0	4.8	5.1	5.2	5.1
Highest:	7.6	7.4	8.1	7.6	7.7
Mean:	-	-	-	-	-
Median:	6.4	6.5	6.3	6.4	6.5

pH of commercial samples (% of total number of samples):

	<4.5	4.5-4.9	5.0-5.4	5.5-5.9	6.0-6.4	6.5-6.9	7.0-7.4	7.5-7.9	8.0-8.4	>8.4	Total
2002	0	0	6	15	33	32	13	1	0	0	100
2003	0	1	3	15	30	40	12	0	0	0	100
2004	0	0	2	21	40	28	8	1	0	0	100
2005	0	0	3	18	31	36	11	1	0	0	100
2006	0	0	2	10	29	44	14	2	0	0	100
Total	0	0	3	15	32	37	12	1	0	0	100

7. Phosphorus

7.1 Homeowner Samples

Phosphorus (lbs/acre Morgan P) in homeowner samples (numbers):

	<1	1-3	4-8	9-39	40-60	61-80	81-100	101-150	151-200	>200	Total
	VL	L	M	H	VH	VH	VH	VH	VH	VH	
#	0	11	23	15	8	6	2	8	5	3	81
%	0	14	28	19	10	7	2	10	6	4	100

Lowest: 1

Highest: 360

Mean: 50

Median: 12

7.2 Commercial Samples

Phosphorus (lbs P/acre Morgan extraction) for commercial samples (number):

	<1	1-3	4-8	9-39	40-60	61-80	81-100	101-150	151-200	>200	Total
	VL	L	M	H	VH	VH	VH	VH	VH	VH	
2002	0	80	38	16	1	2	1	0	0	0	138
2003	0	104	38	37	4	3	0	2	0	3	191
2004	0	94	80	77	13	2	1	0	0	1	268
2005	0	167	75	61	9	4	2	2	0	2	322
2006	0	199	82	104	6	2	2	1	0	1	397
Total	0	644	313	295	33	13	6	5	0	7	1316

VL = very low, L = low, M = medium, H = high, VH = very high.

	2002	2003	2004	2005	2006
Lowest:	1	1	1	1	1
Highest:	89	237	202	397	223
Mean:	6	11	11	12	9
Median:	3	3	5	3	3

Phosphorus in commercial samples (% of total number of samples):

	<1	1-3	4-8	9-39	40-60	61-80	81-100	101-150	151-200	>200	Total
	VL	L	M	H	VH	VH	VH	VH	VH	VH	
2002	0	58	28	12	1	1	1	0	0	0	100
2003	0	54	20	19	2	2	0	1	0	2	100
2004	0	35	30	29	5	1	0	0	0	0	100
2005	0	52	23	19	3	1	1	1	0	1	100
2006	0	50	21	26	2	1	1	0	0	0	100
Total	0	49	24	22	3	1	0	0	0	1	100

VL = very low, L = low, M = medium, H = high, VH = very high.

8. Potassium

8.1 Homeowner Samples

Potassium (lbs K/acre Morgan extraction) in homeowner samples (number):

Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	1	3	17	21
Total (%)	0	0	5	14	81	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	1	1	7	6	15
Total (%)	0	7	7	47	40	100
Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	1	1	6	6	24	38
Total (%)	3	3	16	16	63	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	2	1	1	2	1	7
Total (%)	29	14	14	29	14	100

Potassium classification summary for homeowners:

	Very Low	Low	Medium	High	Very High	Total
Number	3	3	9	18	48	81
Percentage	4	4	11	22	59	100

	2002-2006
Lowest:	35
Highest:	1024
Mean:	298
Median:	258

8.2 Commercial Samples

Potassium (lbs K/acre Morgan extraction) in commercial samples (number):

Soil Management Group 1						
	<35	35-64	65-94	95-149	>149	Total
	Very Low	Low	Medium	High	Very High	
2002	0	1	5	7	4	17
2003	0	3	6	9	10	28
2004	0	2	2	6	7	17
2005	0	1	3	0	4	8
2006	0	1	14	26	11	52
Total (#)	0	8	30	48	36	122
Total (%)	0	7	25	39	30	100
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
2002	0	10	41	36	12	99
2003	0	22	49	29	29	129
2004	1	18	33	63	51	166
2005	0	26	76	89	89	280
2006	1	10	82	139	68	300
Total (#)	2	86	281	356	249	974
Total (%)	0	9	29	37	26	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	1	1	3	9	6	20
2003	0	3	6	11	14	34
2004	0	8	18	22	27	75
2005	0	0	2	18	11	31
2006	0	2	15	16	12	45
Total (#)	1	14	44	76	70	205
Total (%)	0	7	21	37	34	100
Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
2002	0	0	0	1	0	1
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	1	0	2	0	3
2006	0	0	0	0	0	0
Total (#)	0	1	0	3	0	4
Total (%)	0	25	0	75	0	100

Potassium classification summary for commercial samples.

Summary (#)	Very Low	Low	Medium	High	Very High	Un-known	Total
2002	1	12	49	53	22	1	138
2003	0	28	61	49	53	0	191
2004	1	28	53	91	85	10	268
2005	0	28	81	109	104	0	322
2006	1	13	111	181	91	0	397
Grand Total	3	109	355	483	355	11	1316

Summary (%)	Very Low	Low	Medium	High	Very High	Un-known	Total
2002	1	9	36	38	16	1	100
2003	0	15	32	26	28	0	100
2004	0	10	20	34	32	4	100
2005	0	9	25	34	32	0	100
2006	0	3	28	46	23	0	100
Grand Total	0	8	27	37	27	1	100

	2002	2003	2004	2005	2006
Lowest:	37	40	38	45	39
Highest:	784	1563	1009	1211	953
Mean:	127	167	173	167	148
Median:	104	112	130	134	115

9. Magnesium

9.1 Homeowner Samples

Magnesium (lbs Mg/acre Morgan extraction) in homeowner samples (numbers):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
Number	0	1	2	12	66	81
Percentage	0	1	2	15	81	100

	2002-2006
Lowest:	35
Highest:	1773
Mean:	387
Median:	310

9.2 Commercial Samples

Magnesium (lbs Mg/acre Morgan extraction) in commercial samples (number):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	0	1	3	40	94	138
2003	0	2	5	36	148	191
2004	0	3	12	66	187	268
2005	0	2	6	78	236	322
2006	0	2	10	139	246	397
Total	0	10	36	359	911	1316

	2002	2003	2004	2005	2006
Lowest:	37	58	48	60	56
Highest:	849	779	718	905	1390
Mean:	283	328	291	300	255
Median:	253	314	265	278	234

Magnesium in commercial samples (% of total number of samples):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	0	1	2	29	68	100
2003	0	1	3	19	77	100
2004	0	1	4	25	70	100
2005	0	1	2	24	73	100
2006	0	1	3	35	62	100
Total	0	1	3	27	69	100

10. Iron

10.1 Homeowner Samples

Iron (lbs Fe/acre Morgan extraction) in homeowner samples:

Total number of samples:			Percentages:			
	0-49	>49	Total	0-49	>49	Total
	Normal	Excessive		Normal	Excessive	
Total	75	6	81	93	7	100

	2002-2006
Lowest:	1
Highest:	125
Mean:	16
Median:	7

10.2 Commercial Samples

Iron (lbs Fe/acre Morgan extraction) in commercial samples:

Total number of samples:			Percentages:			
	0-49	>49	Total	0-49	>49	Total
	Normal	Excessive		Normal	Excessive	
2002	138	0	138	100	0	100
2003	186	5	191	97	3	100
2004	261	7	268	97	3	100
2005	315	7	322	98	2	100
2006	391	6	397	98	2	100
Total	1291	25	1316	98	2	100

	2002	2003	2004	2005	2006
Lowest:	1	1	1	1	1
Highest:	38	106	212	96	102
Mean:	8	11	12	11	8
Median:	5	6	6	7	5

11. Manganese

11.1 Homeowner Samples

Manganese (lbs Mn/acre Morgan extraction) in homeowner samples:

Total number of samples:				Percentages:		
	0-99	>99	Total	0-99	>99	Total
	Normal	Excessive		Normal	Excessive	
Total	77	4	81	95	5	100

	2002-2006
Lowest:	10
Highest:	126
Mean:	45
Median:	38

11.2 Commercial Samples

Manganese (lbs Mn/acre Morgan extraction) in commercial samples:

Total number of samples:				Percentages:		
	0-99	>99	Total	0-99	>99	Total
	Normal	Excessive		Normal	Excessive	
2002	136	2	138	99	1	100
2003	187	4	191	98	2	100
2004	250	18	268	93	7	100
2005	322	0	322	100	0	100
2006	396	1	397	100	0	100
Total	1291	25	1316	98	2	100

	2002	2003	2004	2005	2006
Lowest:	5	5	7	9	9
Highest:	173	190	894	95	117
Mean:	28	33	44	24	22
Median:	24	28	23	21	20

12. Zinc

12.1 Homeowner Samples

Zinc (lbs Zn/acre Morgan extraction) in homeowner samples:

Total number of samples:

	<0.5	0.5-1.0	>1	Total
	Low	Medium	High	
Total	2	7	72	81

Percentages:

	<0.5	0.5-1.0	>1	Total
	Low	Medium	High	
	2	9	89	100

	2002-2006
Lowest:	0.1
Highest:	36.6
Mean:	6.2
Median:	3.6

12.2 Commercial Samples

Zinc (lbs Zn/acre Morgan extraction) in commercial samples:

Total number of samples:

	<0.5	0.5-1.0	>1	Total
	Low	Medium	High	
2002	11	56	71	138
2003	35	79	77	191
2004	37	91	140	268
2005	43	162	117	322
2006	104	202	91	397
Total	230	590	496	1316

Percentages:

	<0.5	0.5-1.0	>1	Total
	Low	Medium	High	
	8	41	51	100
	18	41	40	100
	14	34	52	100
	13	50	36	100
	26	51	23	100
	17	45	38	100

	2002	2003	2004	2005	2006
Lowest:	0.2	0.1	0.1	0.1	0.1
Highest:	7.7	7.1	14.6	46.0	21.2
Mean:	1.4	1.2	1.5	1.2	0.9
Median:	1.1	1.0	1.1	0.8	0.7

Appendix: Cornell Crop Codes

Crop codes used in the Cornell Nutrient Analysis Laboratory.

Crop Code	Crop Description
Alfalfa	
ABE	Alfalfa trefoil grass, Establishment
ABT	Alfalfa trefoil grass, Established
AGE	Alfalfa grass, Establishment
AGT	Alfalfa grass, Established
ALE	Alfalfa, Establishment
ALT	Alfalfa, Established
Birdsfoot	
BCE	Birdsfoot trefoil clover, Establishment
BCT	Birdsfoot trefoil clover, Established
BGE	Birdsfoot trefoil grass, Establishment
BGT	Birdsfoot trefoil grass, Established
BSE	Birdsfoot trefoil seed, Establishment
BST	Birdsfoot trefoil seed, Established
BTE	Birdsfoot trefoil, Establishment
BTT	Birdsfoot trefoil, Established
Barley	
BSP	Spring barley
BSS	Spring barley with legumes
BUK	Buckwheat
BWI	Winter barley
BWS	Winter barley with legumes
Clover	
CGE	Clover grass, Establishment
CGT	Clover grass, Established
CLE	Clover, Establishment
CLT	Clover, Established
CSE	Clover seed production, Establishment
CST	Clover seed production, Established
Corn	
COG	Corn grain
COS	Corn silage

Crop Code	Crop Description
	Grasses, pastures, covercrops
CVE	Crownvetch, Establishment
CVT	Crownvetch, Established
GIE	Grasses intensively managed, Establishment
GIT	Grasses intensively managed, Established
GRE	Grasses, Establishment
GRT	Grasses, Established
PGE	Pasture, Establishment
PGT	Pasture improved grasses, Established
PIE	Pasture intensively grazed, Establishment
PIT	Pasture intensively grazed, Established
PLE	Pasture with legumes, Establishment
PLT	Pasture with legumes, Established
PNT	Pasture native grasses
RYC	Rye cover crop
RYS	Rye seed production
TRP	Triticale peas
	Small grains
MIL	Millet
OAS	Oats seeded with legume
OAT	Oats
SOF	Sorghum forage
SOG	Sorghum grain
SOY	Soybeans
SSH	Sorghum sudan hybrid
SUD	Sudangrass
WHS	Wheat with legume
WHT	Wheat
	Others
ALG	Azalea
APP	Apples
ATF	Athletic field
BDR/DND	Beans-dry
BLU	Blueberries
CEM	Cemetery
FAR	Fairway
FLA	Flowering annuals
GRA	Grapes

Crop Code	Crop Description
GEN	Green
HRB	Herbs
IDL	Idle land
LAW	Lawn
MIX/MVG	Mixed vegetables
PER	Perennials
PRK	Park
POT/PTO	Potatoes
PUM	Pumpkins
ROD	Roadside
ROS	Roses
RSF	Raspberries, Fall
RSP	Raspberries (homeowners)
RSS	Raspberries, Summer
SAG	Ornamentals adapted to pH 6.0 to 7.5
SQW	Squash, Winter
STE	Strawberries, Ever
STR	Strawberries (homeowners)
STS	Strawberries, Spring
SUN	Sunflowers
SWC	Sweet corn
TOM	Tomatoes
TRE	Christmas trees, Establishment
TRF	Tree Fruits
TRT	Christmas trees, Topdressing