

Rao, R., B. Chedzoy, C. Albers, E. Dalrymple, Q.M. Ketterings, and H. Krol (2007).
Chenango Soil Sample Survey (2002-2006). CSS Extension Bulletin E07-9. 32 pages.

Soil Sample Survey

Schuyler County

Samples analyzed by CNAL (2002-2006)



Schuyler County (photo credit: Brett Chedzoy, CCE of Schuyler 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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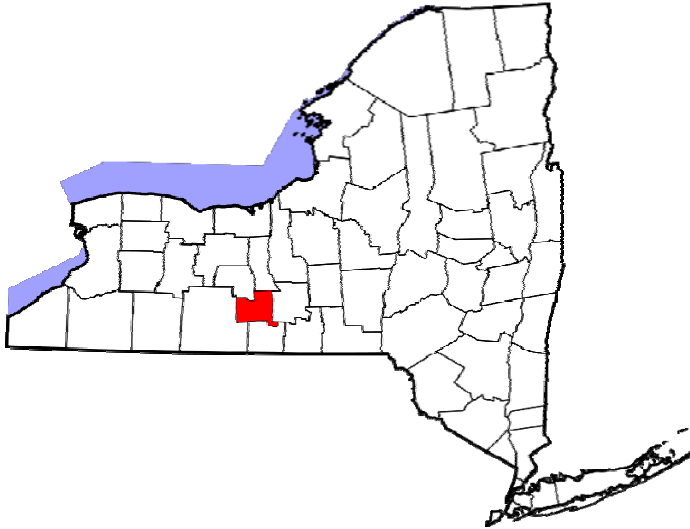


Schuyler County (photo credit: Brett Chedzoy, CCE of Schuyler County).



1. County Introduction

The total area of Schuyler is about 210,400 acres. Elevations range from 445 feet along



Seneca Lake to over 2,000 feet in the western edge of the county. As a result, the growing season varies considerably. It generally ranges from 108 to 158 days, with an average of 133 days. Precipitation averages about 34 inches per year.

According to the 1979 Soil Survey of Schuyler County the fairly productive Valois-Howard-Chenango, Conesus-Appleton-Lansing, and Schoharie-Hudson-Rhinebeck soil associations cover over about a third of the county land mass.

Agriculture in Schuyler County involves over 400 reported farm businesses, both large and small, generating sales of over \$17 million in 2002, not including winery sales. The average value of capital investment per farm was nearly \$250,000, signifying a county-wide investment of over \$75 million.

Although many of Schuyler's farms are relatively small, they are well diversified. The trend of value-added production has increased significantly in the past 10 years, with wineries leading the way. Schuyler farms now demonstrate value-added production in the forms of cheese, agritourism, fiber products, preserves and custom cut meats, which are successfully marketed both locally and regionally. Schuyler's large tourism draw and proximity to metropolitan markets give it a strong advantage for value-added and direct marketing efforts. Two seasonal farmers markets exist in Schuyler.

Dairies are the largest economic contributor to the county's agricultural sector. These range from small, seasonal operations to large, high-tech dairies. All are family owned, and one is certified organic.

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Schuyler's 125,000 acres of forest support 6 forest industry establishments, which employ about 200 people. One of New York's largest hardwood sawmills is located in the county. These diverse forests consist of many of the world's most valuable timber species, such as maple, oak, cherry, ash, walnut and others. This forest land is shared by over 2,000 private forest owners. Several large public forest holding are also found in Schuyler, including Cornell's Arnot Forest, the Finger Lakes National Forest, Connecticut Hill State Game Management Area, and numerous state forests and parks.

Agriculture produces a much higher economic multiplier impact than any other sector of the county economy. A Bureau of Economic Analysis study for Schuyler County indicates the direct multiplier for agricultural output is effectually 1.63, meaning that every dollar of farm sales generates \$1.63 in output in our local economy.

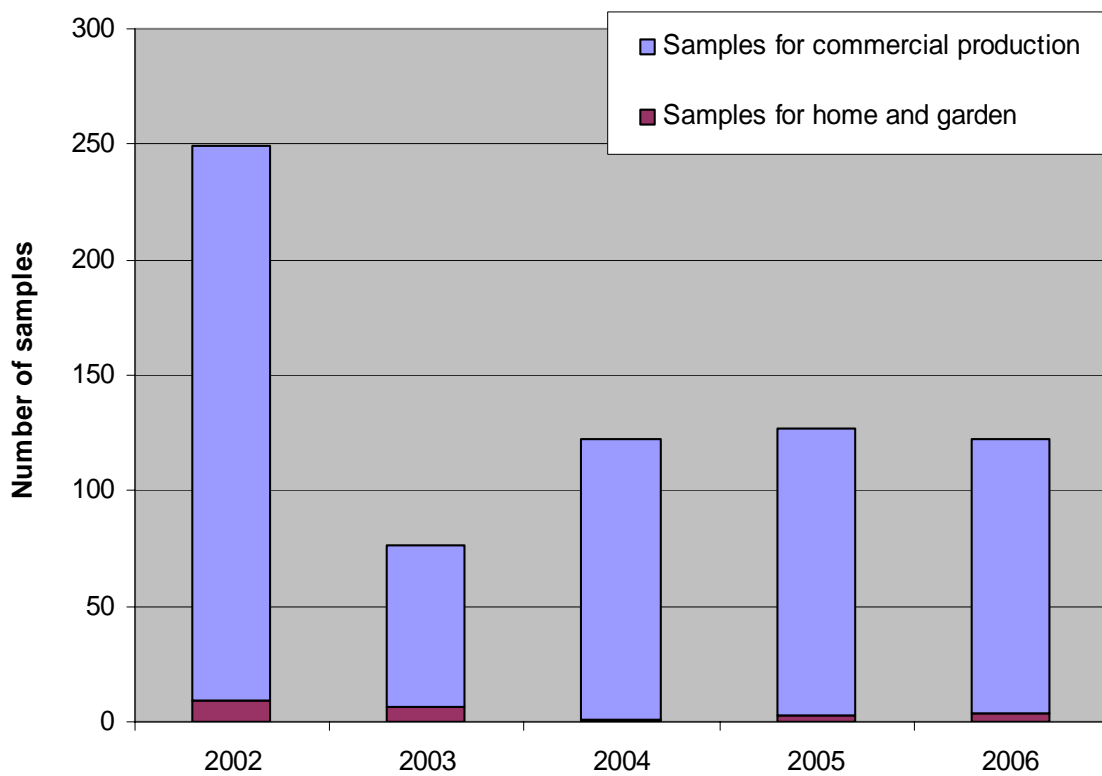
Schuyler's forest industry – closely related to agriculture - is the only sector with a higher multiplier effect (1.71). Both far outrank other county industries in multiplier impacts. Using relative multipliers, agriculture alone represents a total contribution to Schuyler's economy of \$23 million. Forest industry generates another \$15 million in impact, and wineries produce over \$6 million, bringing the total impact of agricultural-related industries on the county economy to about \$44 million, not including tourism benefits.

Schuyler's farms are tax winners because they do not demand a large amount of services, and provide other benefits such as employment. The data, in fact, indicate that agriculture typically requires only \$0.15 to \$0.40 of town and school expenditures for every \$1.00 in tax revenue it generates, whereas residential development costs \$1.09 to \$1.56 per \$1.00 of taxes gathered. Schuyler's farms also preserve the county's rural character and open spaces, which are essential to the quality of life for its residents, and to other key industries such as tourism. Many other industries that support Schuyler's farmers are also dependent on the strength of the agricultural sector for their well being.

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2. General Survey Summary

This survey summarizes the soil test results from grower (identified as “commercial samples”) and homeowner samples from Schuyler County submitted to the Cornell Nutrient Analysis Laboratory (CNAL) from 2002 to 2006. The total number of samples analyzed in these years amounted to 696. Of these, 673 samples (97%) were submitted by commercial growers while 23 samples (3%) were submitted by homeowners.



Homeowners		Commercial		Total
2002	9	2002	240	249
2003	6	2003	70	76
2004	1	2004	121	122
2005	3	2005	124	127
<u>2006</u>	<u>4</u>	<u>2006</u>	<u>118</u>	<u>122</u>
Total	23	Total	673	696

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The majority (61%) of the homeowners that submitted soil samples to the Cornell Nutrient Analysis Laboratory during 2002-2006 requested fertilizer recommendations for home garden vegetable production. Commercial growers submitted samples to grow alfalfa or alfalfa/grass mixes (25%), corn silage or grain (24%), grapes (17%), and grass hay production (9%) while a few growers were planning to grow clover/grass mixes, small grains and other crops.

Soils tested for home and garden in Schuyler County were classified as belonging to soil management group 2 (22%), group 3 (22%), or group 4 (57%). 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 (56%) belonged to soil management group 3. There were no group 5 or 6 samples. Seven percent were group 1 samples. Thirty four percent belonged to group 2 while 3% were group 4 soils. Mardin was the most common soil series (12% of all samples), followed by Conesus (11%), Volusia (10%), Valois (9%) and Lansing (9%).

Organic matter levels, as measured by loss-on-ignition, ranged from less than 1% to 11%. For homeowners most samples had between 3 and 6% organic matter (73% of all

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samples), while 18% had 6% organic matter or more. Of the samples submitted by commercial growers, 82% contained between 3 and 6% organic matter.

Soil pH in water (1:1 extraction ratio) varied from 3.7 to 8.1. For home and garden samples 52% tested between 6.0 and 7.4 for pH. For the commercial samples 68% tested between 6.0 and 7.4 while 30% had a pH between 5.0 and 5.9.

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, 4% of the soils tested low for P, 9% tested medium, 22% tested high and 61% tested very high. This meant that 83% tested high or very high in P. For commercial growers, only 4% tested very high. In total 35% were low in P, 27% tested medium for P while 34% of the submitted samples were classified as high in soil test P. This means that 38% 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 on page 6).

Potassium classifications for Schuyler County soils varied from low (6% of the commercial growers' soils) to very high (78% of the homeowner soils and 48% of the commercial growers' soils). For homeowners, 9% tested medium, and 12% tested high for potassium. For commercial growers' soils, 6% tested low, 17% tested medium and 28% tested high in K.

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

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 53 to 1358 lbs Mg/acre. There were no soils that tested very low or low for Mg. Most soils tested high or very high for Mg (100% of the homeowner soils and 99% of the soils of the commercial growers) while 1% of the commercial samples tested medium in Mg.

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 91-96% in the normal range with only 9% of the homeowner soils and 4% of the commercial grower soils testing excessive for Fe. Similarly, most soils (91-99%) 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, 91% tested high for Zn while 4% tested medium and 4% were low in Zn. Of the commercial growers' samples, 6% tested low, 22% tested medium while 73% 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	%
LAW	1	4
MVG	14	61
OTH	2	9
PER	1	4
SAG	5	22
Total	23	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	%
ABT	0	5	0	0	0	5	1
AGE/AGT	17	10	14	37	13	91	13
ALE/ALT	34	1	27	0	16	78	11
APP	0	0	3	0	1	4	1
BCE	0	0	0	0	1	1	0
BGT	0	2	0	0	0	2	0
BLB	0	0	1	0	1	2	0
BUK	0	0	0	0	1	1	0
BWI	1	0	0	0	0	1	0
CGE/CGT	4	1	7	4	0	16	2
CLE	0	0	2	1	0	3	0
COG/COS	63	8	22	35	35	163	24
GIE/GIT	0	0	2	0	5	7	1
GPA	5	6	2	0	0	13	2
GPF	19	0	6	3	6	34	5
GPV	20	12	9	22	9	72	10
GRE/GRT	26	6	14	6	3	55	8
IDL	1	1	0	0	0	2	0
MIX	1	2	0	2	3	8	1
OAS	14	2	1	0	2	19	3
OAT	2	0	0	0	0	2	0
PCH	0	0	1	0	0	1	0
PGE/PGT	0	3	0	3	0	6	1
PIE/PIT	21	1	0	2	16	40	6
PLE/PLT	0	5	0	1	2	8	1
PNT	0	0	2	2	1	5	1
POT	0	1	0	0	0	1	0
RYS	2	0	0	0	1	3	0
SOY	0	0	0	1	0	1	0
SSH	0	0	0	3	0	3	0
SUN	1	0	0	0	0	1	0
SWC	1	0	0	0	0	1	0
TOM	0	1	0	0	0	1	0
TRE/TRT	0	1	0	1	0	2	0
WHT	5	0	6	1	2	14	2
Unknown	3	2	2	0	0	7	1
Total	240	70	121	124	118	673	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)	5	22
SMG 3 (silt loam)	5	22
SMG 4 (sandy loam)	13	57
SMG 5 (sandy)	0	0
SMG 6 (mucky)	0	0
Total	23	100

4.2 Commercial Samples

Soil series for commercial samples:

Name	SMG	2002	2003	2004	2005	2006	Total	%
Angola	2	3	0	2	0	0	5	1
Appleton	2	7	2	1	5	6	21	3
Atkins	3	0	1	0	0	1	2	0
Bath	3	1	0	0	0	0	1	0
Burdett	2	0	3	2	6	0	11	2
Castile	4	6	0	2	1	9	18	3
Cayuga	2	0	0	2	0	0	2	0
Chenango	3	6	2	8	12	7	35	5
Collamer	3	3	1	1	11	2	18	3
Conesus	2	25	4	15	14	16	74	11
Dunkirk	3	0	0	1	0	0	1	0
Erie	3	8	3	4	4	7	26	4
Fremont	2	2	0	1	0	0	3	0
Howard	3	8	11	2	8	18	47	7
Hudson	2	2	1	4	9	0	16	2
Lansing	2	25	8	14	18	0	65	9
Lordstown	3	11	9	5	4	0	29	4
Mardin	3	32	4	18	12	19	85	12
Odessa	2	3	0	2	0	1	6	1
Ovid	2	0	0	0	1	0	1	0
Philo	3	0	0	0	0	2	2	0
Red Hook	4	0	1	0	1	0	2	0
Rhinebeck	2	10	1	2	7	0	20	3
Romulus	2	0	0	2	0	0	2	0
Schoharie	1	16	6	12	4	9	47	7
Teel	2	0	0	0	0	1	1	0
Valois	3	34	13	9	2	6	64	9
Volusia	3	38	0	12	4	14	68	10
Unknown	-	0	0	0	1	0	1	0
Total	-	240	70	121	124	118	673	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
Total	0	0	2	9	1	7	2	2	23
%	0	0	9	39	4	30	9	9	100

	2002-2006
Lowest:	2.5
Highest:	9.1
Mean:	4.7
Median:	4.3

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	0	32	86	91	25	5	1	240
2003	1	1	10	37	16	4	0	1	70
2004	0	6	12	48	37	11	5	2	121
2005	1	6	28	61	23	3	1	1	124
2006	0	2	9	78	26	3	0	0	118
Total	2	15	91	310	193	46	11	5	673

	2002	2003	2004	2005	2006
Lowest:	2.0	0.7	1.1	0.7	1.5
Highest:	7.8	9.1	11.2	7.0	5.8
Mean:	4.0	3.7	4.0	3.4	3.6
Median:	4.0	3.6	3.8	3.3	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	0	13	36	38	10	2	0	100
2003	1	1	14	53	23	6	0	1	100
2004	0	5	10	40	31	9	4	2	100
2005	1	5	23	49	19	2	1	1	100
2006	0	2	8	66	22	3	0	0	100
Total	0	2	14	46	29	7	2	1	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
Total	0	0	2	2	2	4	6	6	1	0	23
%	0	0	9	9	9	17	26	26	0	0	100

	2002-2006
Lowest:	5.0
Highest:	8.1
Mean:	-
Median:	7.0

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	3	19	63	74	60	20	1	0	0	240
2003	1	2	11	17	22	9	7	1	0	0	70
2004	0	3	11	17	47	39	4	0	0	0	121
2005	0	1	8	22	47	38	5	3	0	0	124
2006	0	1	12	21	44	35	4	1	0	0	118
Total	1	10	61	140	234	181	40	6	0	0	673

	2002	2003	2004	2005	2006
Lowest:	4.8	3.7	4.5	4.7	4.9
Highest:	7.7	7.6	7.1	7.8	7.5
Mean:	-	-	-	-	-
Median:	6.2	6.0	6.3	6.3	6.3

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	1	8	26	31	25	8	0	0	0	100
2003	1	3	16	24	31	13	10	1	0	0	100
2004	0	2	9	14	39	32	3	0	0	0	100
2005	0	1	6	18	38	31	4	2	0	0	100
2006	0	1	10	18	37	30	3	1	0	0	100
Total	0	1	9	21	35	27	6	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	-	
Total	0	1	2	5	3	1	2	1	3	4	1	23
%	0	4	9	22	13	4	9	4	0	17	4	100

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

	2002-2006
Lowest:	1
Highest:	609
Mean:	131
Median:	48

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	98	70	69	3	0	0	0	0	0	240
2003	0	27	19	21	1	1	0	0	0	1	70
2004	0	37	32	39	9	4	0	0	0	0	121
2005	0	40	27	51	3	2	1	0	0	0	124
2006	0	34	32	50	2	0	0	0	0	0	118
Total	0	236	180	230	18	7	1	0	0	1	673

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

	2002	2003	2004	2005	2006
Lowest:	1	1	1	1	1
Highest:	59	406	75	91	49
Mean:	8	15	14	13	9
Median:	5	5	6	8	7

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	41	29	29	1	0	0	0	0	0	100
2003	0	39	27	30	1	1	0	0	0	1	100
2004	0	31	26	32	7	3	0	0	0	0	100
2005	0	32	22	41	2	2	1	0	0	0	100
2006	0	29	27	42	2	0	0	0	0	0	100
Total	0	35	27	34	3	1	0	0	0	0	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 1						
	<35	35-64	65-94	95-149	>149	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	0	1	4	5
Total (%)	0	0	0	20	80	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	0	0	5	5
Total (%)	0	0	0	0	100	100
Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	2	2	9	13
Total (%)	0	0	15	15	69	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-
Soil Management Group 6						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-

Rao, R., B. Chedzoy, C. Albers, E. Dalrymple, Q.M. Ketterings, and H. Krol (2007).
 Chenango Soil Sample Survey (2002-2006). CSS Extension Bulletin E07-9. 32 pages.

Potassium classification summary for homeowners:

Summary (#)	Very Low	Low	Medium	High	Very High	Total
Grand Total	0	0	2	3	18	23
%	0	0	9	13	78	100

	2002-2006
Lowest:	134
Highest:	1352
Mean:	461
Median:	337

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	0	0	3	13	16
2003	0	0	0	0	6	6
2004	0	0	1	1	10	12
2005	0	1	0	0	3	4
2006	0	0	0	0	9	9
Total (#)	0	1	1	4	41	47
Total (%)	0	2	2	9	87	100
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
2002	0	2	6	20	49	77
2003	0	2	5	5	7	19
2004	1	2	5	11	28	47
2005	0	0	3	11	46	60
2006	0	0	0	5	19	24
Total (#)	1	6	19	52	149	227
Total (%)	0	3	8	23	66	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	1	12	27	55	46	141
2003	0	4	10	11	19	44
2004	1	8	18	19	14	60
2005	0	2	16	20	19	57
2006	0	3	22	19	32	76
Total (#)	2	29	93	124	130	378
Total (%)	1	8	25	33	34	100

Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
2002	0	1	2	2	1	6
2003	0	1	0	0	0	1
2004	0	0	0	1	1	2
2005	0	0	0	2	0	2
2006	0	1	2	4	2	7
Total (#)	0	3	4	9	2	18
Total (%)	0	17	22	50	11	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
2002	0	0	0	0	0	0
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	0	0	0
2006	0	0	0	0	0	0
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-
Soil Management Group 6						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
2002	0	0	0	0	0	0
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	0	0	0
2006	0	0	0	0	0	0
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-

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Chenango Soil Sample Survey (2002-2006). CSS Extension Bulletin E07-9. 32 pages.

Potassium classification summary for commercial samples.

Summary (#)	Very Low	Low	Medium	High	Very High	Un-known	Total
2002	1	15	35	80	109	0	240
2003	0	7	15	16	32	0	70
2004	2	10	24	32	53	0	121
2005	0	3	19	33	68	1	124
2006	0	4	24	28	62	0	118
Grand Total	3	39	117	189	324	1	673

Summary (%)	Very Low	Low	Medium	High	Very High	Un-known	Total
2002	0	6	15	33	45	0	100
2003	0	10	21	23	46	0	100
2004	2	8	20	26	44	0	100
2005	0	2	15	27	55	1	100
2006	0	3	20	24	53	0	100
Grand Total	0	6	17	28	48	0	100

	2002	2003	2004	2005	2006
Lowest:	39	51	33	55	65
Highest:	753	988	1020	703	487
Mean:	208	231	215	222	204
Median:	178	161	154	191	205

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	
Total	0	0	0	2	21	23
%	0	0	0	9	91	100

	2002-2006
Lowest:	163
Highest:	943
Mean:	502
Median:	455

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	0	0	10	230	240
2003	0	0	2	9	59	70
2004	0	0	2	6	113	121
2005	0	0	3	3	118	124
2006	0	0	0	11	107	118
Total	0	0	7	39	627	673

	2002	2003	2004	2005	2006
Lowest:	112	90	53	79	112
Highest:	1026	1061	944	1358	943
Mean:	446	402	476	466	428
Median:	440	381	488	452	416

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	0	0	4	96	100
2003	0	0	3	13	84	100
2004	0	0	2	5	93	100
2005	0	0	2	2	95	100
2006	0	0	0	9	91	100
Total	0	0	1	6	93	100

10. Iron

10.1 Homeowner Samples

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

Total number of samples:

	0-49	>49	Total
	Normal	Excessive	
Total	21	2	23

Percentages:

0-49	>49	Total
Normal	Excessive	
91	9	100

	2002-2006
Lowest:	2
Highest:	73
Mean:	12
Median:	8

10.2 Commercial Samples

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

Total number of samples:

	0-49	>49	Total
	Normal	Excessive	
2002	236	4	240
2003	65	5	70
2004	112	9	121
2005	119	5	124
2006	112	6	118
Total	644	29	673

Percentages:

	0-49	>49	Total
	Normal	Excessive	
	98	2	100
	93	7	100
	93	7	100
	96	4	100
	95	5	100
	96	4	100

	2002	2003	2004	2005	2006
Lowest:	1	1	2	1	1
Highest:	65	297	109	125	107
Mean:	11	22	16	11	14
Median:	5	10	8	7	7

11. Manganese

11.1 Homeowner Samples

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

Total number of samples:

	0-99	>99	Total
	Normal	Excessive	
Total	21	2	23

Percentages:

0-99	>99	Total
Normal	Excessive	
91	9	100

	2002-2006
Lowest:	11
Highest:	129
Mean:	52
Median:	42

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	240	0	240	100	0	100
2003	68	2	70	97	3	100
2004	120	1	121	99	1	100
2005	122	2	124	98	2	100
2006	114	4	118	97	3	100
Total	664	9	673	99	1	100

	2002	2003	2004	2005	2006
Lowest:	10	10	6	13	12
Highest:	76	114	289	139	234
Mean:	31	41	33	34	38
Median:	28	38	28	30	31

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	1	1	21	23

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
4	4	91	100

	2002-2006
Lowest:	0.4
Highest:	61.3
Mean:	15.3
Median:	10.7

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	6	52	182	240
2003	5	25	40	70
2004	3	24	94	121
2005	7	20	97	124
2006	17	26	75	118
Total	38	147	488	673

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
3	22	76	100
7	36	57	100
2	20	78	100
6	16	78	100
14	22	64	100
6	22	73	100

	2002	2003	2004	2005	2006
Lowest:	0.1	0.3	0.1	0.1	0.1
Highest:	6.5	19.1	79.5	11.6	13.3
Mean:	1.8	2.2	2.9	2.0	1.5
Median:	1.6	1.2	1.8	1.8	1.2

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

Crop Code	Crop Description
	Corn
COG	Corn grain
COS	Corn silage
	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

Crop Code	Crop Description
CEM	Cemetery
FAR	Fairway
FLA	Flowering annuals
GRA	Grapes
GPA	Grapes, American
GPF	Grapes, French-American
GPV	Grapes, Vinifera
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, Established
TRF	Turf
TRT	Christmas trees, Topdressing