

Rao, R., T. Gallagher, Q.M. Ketterings, and H. Krol (2007). Albany Soil Sample Survey (2002-2006). CSS Extension Bulletin E07-17. 34 pages.

Soil Sample Survey

Albany County

Samples analyzed by CNAL (2002-2006)



Albany County (photo credit: Tom Gallagher, CCE of Albany County).

Summary compiled by
Renuka Rao, Tom Gallagher, Quirine M. Ketterings, and Hettie Krol



Cornell Nutrient Analysis Laboratory

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Nutrient Management Spear Program

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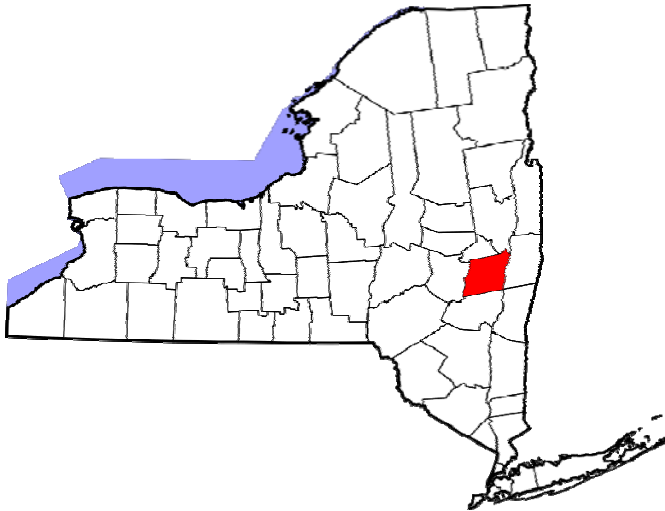
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Albany County (photo credit: Thomas Gallagher, CCE of Albany County).

1. County Introduction

Albany County is located on the west side of the Hudson River in the eastern part of New York State about 140 miles north of New York City. The county is rectangular in shape being 20 miles wide east to west and 35 miles deep north to south.



The county contains two major physiographic regions; the northeastern half of the county lies within the Hudson-Mohawk lowlands, and the southwestern half lies within the Helderberg Mountain section of the Appalachian uplands. Elevations range from mean sea level along the Hudson River at the Port of Albany to 2,180 feet above sea level at Cheese Hill.

The total area of Albany County is 527 square miles or 339,840 acres. About 20% of the land area of the county or 68,000 acres is in farms. There are three cities located in the County one of which is the City of Albany, which is both the County seat and the Capital of New York State.

Over the past decade both the number of farms and the land being farmed has decreased slightly. Dairy farming has decreased considerably but is still economically important to the county. Part-time and small farms have increased in recent years to produce products to meet the many niche markets in the area. Specialty crops such as pumpkins, and other vegetables and fruits are grown on large acreage of alluvial soils and in the sand and clay deposits of Old Lake Albany.

The horticulture industry has remained relatively stable for agriculture in the County after a twofold expansion during the 1990's. Farms and farmland continue to play a vital role in Albany County's communities. Agriculture has many attributes that make it a necessary and a desirable part of a community. Farms contribute to local and regional food supplies, are an important component of the area's tourism industry, contribute to the

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local and regional economy and are a critical component of the rural character and the quality of life in the county.

In recognition of the important role agriculture plays in the economic and cultural life of many of the residents of Albany County, the Agriculture and Farmland Protection Board has developed an Agriculture and Farmland Protection plan to protect, preserve, and enhance farming in the county. This plan through its long term goals and objectives will help to stabilize and sustain a valuable industry in Albany County.

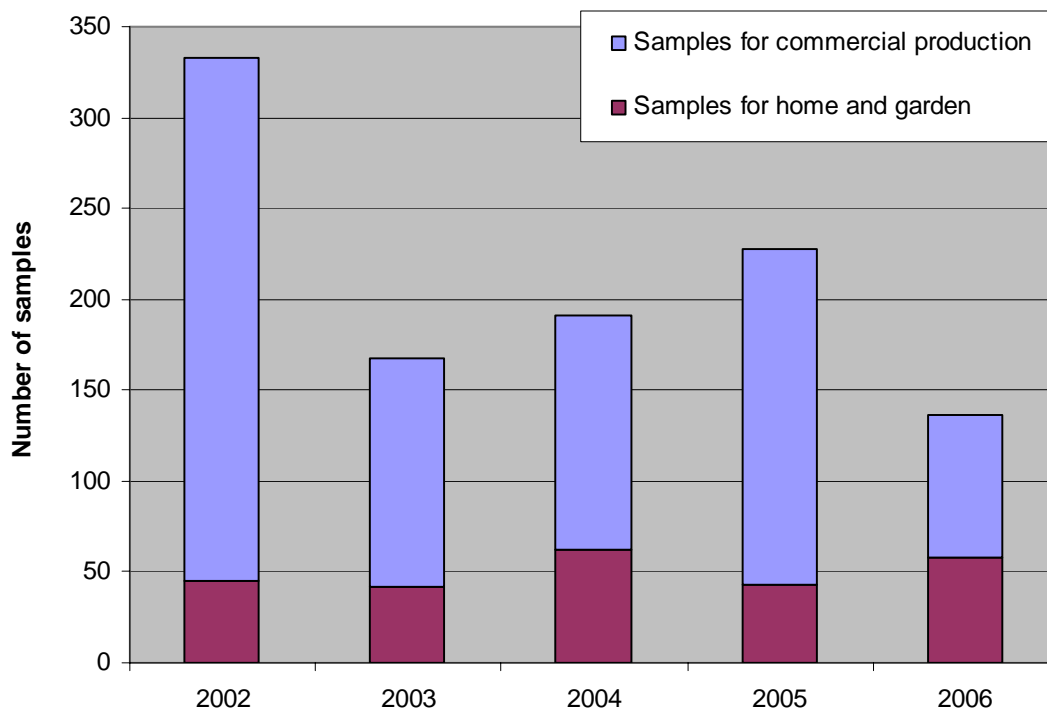
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Albany County (photo credit: Thomas Gallagher, CCE of Albany County).

2. General Survey Summary

This survey summarizes the soil test results from grower (identified as “commercial samples”) and homeowner samples from Albany County submitted to the Cornell Nutrient Analysis Laboratory (CNAL) from 2002 to 2006. The total number of samples analyzed in these years amounted to 1055. Of these, 805 samples (76%) were submitted by commercial growers while 250 samples (24%) were submitted by homeowners.



Homeowners		Commercial		Total
2002	45	2002	288	333
2003	42	2003	125	167
2004	62	2004	129	191
2005	43	2005	185	228
<u>2006</u>	<u>58</u>	<u>2006</u>	<u>78</u>	<u>136</u>
Total	250	Total	805	1055

Homeowner samples were mostly submitted to request fertilizer recommendations for lawns (37%), home garden vegetable production (14%), athletic fields (16%), ornamentals (10%). Commercial growers submitted samples to grow alfalfa or alfalfa/grass mixes (28%), corn silage or grain (25%), and grass hay production (19%) while a few growers were planning to grow clover/grass mixes and other crops.

Soils tested for home and garden in Albany County were classified as belonging to soil management group 5 (30%), group 4 (22%), group 3 (18%), or group 2 (30%). 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 (61%) belonged to soil management group 2. There was only 1 sample from group 1. Twenty four percent belonged to group 3. Group 4 was represented by 9% of the samples while 5% were group 5 soils. There were two organic soils (Carlisle). Nunda was the most common soil series (30% of all samples), followed by Burdett (13%), Rhinebeck (9%), and Farmington and Chenango (5% each).

Organic matter levels, as measured by loss-on- ignition, ranged from less than 1% to almost 50% (organic soils). For homeowners samples 49% had between 2 and 5% organic matter, 7% testing between 5 and 6% organic matter and 10% was classified as soils with

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more than 6.9% organic matter. Of the samples submitted by commercial growers, 62% contained between 3 and 6% organic matter while 22% had between 2 and 3% organic matter.

Soil pH in water (1:1 extraction ratio) varied from 3.9 to 8.4 for home and garden samples while 52% tested between 6.0 and 7.4 for pH. For the commercial samples, the highest pH was 8.4 and 77% tested between 6.0 and 7.4.

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, 8% of the soils tested low for P, 14% tested medium, 44% tested high and 24% tested very high. This meant that 68% tested high or very high in P. For commercial growers, 7% tested very high. In total 49% was low in P, 21% tested medium for P while 23% of the submitted samples were classified as high in soil test P. This means that 30% 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 Albany County soils varied from very low (4% of the homeowner soils and 3% of the commercial growers' soils) to very high (45% of the homeowner soils and 22% of the commercial growers' soils). For homeowners, 14% tested low in K, 16% tested medium, and 21% tested high for potassium. For commercial growers' soils, 17% tested low, 28% tested medium and 29% were 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 1 to almost 4000 lbs Mg/acre. There were only six homeowner soils and ten commercial fields that tested very low for Mg. Most soils tested high or very high for Mg (87% of the homeowner soils and 93% of the soils of the commercial growers). In total 10% of the homeowner soils and 6% of the commercial growers' soil tested low or 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 93-95% in the normal range with only 7% of the homeowner soils and 5% 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, 87% tested high for Zn while 11% tested medium and 2% were low. Of the commercial growers' samples, 15% tested low, 38% tested medium while 48% was 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	2003	2004	2005	2006	Total	%
ALG	0	0	0	1	1	2	1
ATF	15	16	10	0	0	41	16
FLA	0	0	1	3	1	5	2
GEN	0	0	1	0	0	1	0
GRA	1	0	0	0	1	2	1
IDL	0	0	0	0	1	1	0
LAW	11	13	24	15	29	92	37
MIX	0	0	0	1	1	2	1
MVG	6	6	8	7	7	34	14
OTH	3	0	1	0	4	8	3
PER	4	1	9	4	3	21	8
RSP	1	0	0	0	0	1	0
SAG	1	2	8	6	9	26	10
SPB	0	0	0	6	1	7	3
Unknown	3	4	0	0	0	7	3
Total	45	42	62	43	58	250	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	6	6	0	0	1	13	2
AGE/AGT	97	25	46	38	6	212	26
APP	2	0	0	0	2	4	0
BCE/BCT	5	0	0	0	0	5	1
BGE/BGT	2	1	3	9	4	19	2
BLB	0	0	1	0	0	1	0
BNS	0	0	2	0	0	2	0
BUK	2	4	0	0	0	6	1
CGE/CGT	1	0	1	1	2	5	1
COG/COS	46	43	16	77	23	205	25
GIE/GIT	15	0	0	0	1	16	2
GRE/GRT	35	18	21	41	22	137	17
IDL	0	0	0	1	0	1	0
MIX	14	1	6	1	1	23	3
OAS	0	1	0	2	0	3	0
OAT	1	1	0	1	1	4	0
OTH	18	1	1	1	2	23	3
PGE/PGT	8	4	0	1	0	13	2
PIE/PIT	7	0	0	1	2	10	1
PLE	1	2	0	0	0	3	0
PNT	5	0	0	7	0	12	1
PUM	2	3	4	0	0	9	1
RSF	0	0	1	0	0	1	0
RSS	1	1	1	0	0	3	0
RYC	1	1	0	1	0	3	0
RYS	5	6	2	0	0	13	2
SOY	0	2	3	1	0	6	1
SQS	1	0	0	0	3	4	0
SQW	0	0	0	0	2	2	0
SSH	0	0	1	0	0	1	0
STS	2	0	2	0	0	4	0
SWC	11	3	10	0	3	27	3
TOM	0	0	0	0	2	2	0
TRE	0	0	0	1	0	1	0
TRT	0	0	0	0	1	1	0
WHT	0	1	0	0	0	1	0
Unknown	0	1	8	1	0	10	1
Total	288	125	129	185	78	805	100

4. Soil Types

4.1 Homeowner Samples

Soil types (soil management groups) for homeowner samples:

	2002	2003	2004	2005	2006	Total	%
SMG 1 (clayey)	0	0	0	0	0	0	0
SMG 2 (silty)	13	15	25	14	8	75	30
SMG 3 (silt loam)	14	7	9	7	7	44	18
SMG 4 (sandy loam)	6	14	13	5	17	55	22
SMG 5 (sandy)	12	6	15	17	26	76	30
SMG 6 (mucky)	0	0	0	0	0	0	0
Total	45	42	62	43	58	250	100

4.2 Commercial Samples

Soil series for commercial samples:

Name	SMG	2002	2003	2004	2005	2006	Total	%
Angola	2	8	0	1	3	1	13	2
Appleton	2	0	0	0	0	1	1	0
Bernardston	4	0	0	0	1	0	1	0
Blasdell	3	1	0	0	0	0	1	0
Burdett	2	31	20	20	20	10	101	13
Busti	3	0	0	1	0	3	4	0
Carlisle	6	0	0	0	0	2	2	0
Castile	4	3	0	0	7	0	10	1
Cazenovia	2	0	0	1	0	0	1	0
Chautauqua	3	3	0	0	1	8	12	1
Chenango	3	16	2	0	13	7	38	5
Claverack	4	0	0	1	0	0	1	0
Colonie	5	15	5	6	0	7	33	4
Conesus	2	0	1	0	0	0	1	0
Cosad	4	0	0	2	0	0	2	0
Elmridge	5	1	1	0	0	0	2	0
Elmwood	4	0	1	0	0	0	1	0
Elnora	5	8	0	0	0	0	8	1
Farmington	3	15	7	10	6	0	38	5
Galway	4	13	0	0	0	0	13	2
Hamlin	2	5	1	6	2	0	14	2
Honeoye	2	0	0	2	0	0	2	0
Hoosic	4	2	0	0	0	0	2	0
Howard	3	9	2	0	7	0	18	2
Hudson	2	2	9	4	2	4	21	3
Ilion	2	0	1	0	0	0	1	0
Kearsarge	3	5	0	0	4	1	10	1
Lagross	3	1	0	0	0	0	1	0
Lordstown	3	0	1	0	0	1	2	0
Madalin	1	0	0	1	0	0	1	0
Madrid	4	1	0	0	0	0	1	0
Manlius	3	0	0	0	0	1	1	0
Melrose	4	0	0	0	1	0	1	0
Middlebury	3	3	2	0	2	2	9	1
Nassau	4	1	0	0	0	0	1	0
Nellis	4	2	0	0	0	0	2	0

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Name	SMG	2002	2003	2004	2005	2006	Total	%
Nunda	2	85	34	27	76	20	242	30
Palmyra	3	0	0	3	0	0	3	0
Pinckney	3	1	0	0	0	0	1	0
Raynham	3	3	0	3	1	1	8	1
Rhinebeck	2	13	23	13	18	2	69	9
Riverhead	4	7	0	7	1	1	16	2
Scio	3	0	2	1	6	0	9	1
Stafford	4	4	0	0	0	0	4	0
Teel	2	10	4	3	0	1	18	2
Tuller	3	2	0	1	0	0	3	0
Unadilla	3	1	0	2	0	1	4	0
Valois	3	8	3	9	5	1	26	3
Venango	3	0	0	0	2	0	2	0
Wakeland	3	1	0	0	0	1	2	0
Wassaic	4	6	3	2	5	1	17	2
Wayland	2	2	2	0	1	0	5	1
Wellsboro	3	0	0	1	0	0	1	0
Unknown	-	0	1	2	1	1	5	1
Total	-	288	125	129	185	78	805	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
2002	3	4	10	10	4	6	4	4	45
2003	3	8	11	11	3	1	1	4	42
2004	8	12	7	8	9	6	5	7	62
2005	6	6	11	1	8	3	3	5	43
2006	8	15	20	5	3	2	1	4	58
Total	28	45	59	35	27	18	14	24	250

	2002	2003	2004	2005	2006
Lowest:	0.5	0.2	0.6	0.3	0.1
Highest:	25.4	33.6	44.2	25.4	36.2
Mean:	4.6	3.8	4.6	4.1	3.7
Median:	3.4	2.7	3.6	2.7	2.1

Organic matter in homeowner 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	7	9	22	22	9	13	9	9	100
2003	7	19	26	26	7	2	2	10	100
2004	13	19	11	13	15	11	8	11	100
2005	14	14	26	2	19	7	7	12	100
2006	14	26	34	9	5	3	2	7	100
Total	11	18	24	14	11	7	6	10	100

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	8	11	64	90	46	36	21	12	288
2003	0	9	23	57	18	8	2	8	125
2004	6	8	34	45	13	12	2	9	129
2005	0	2	54	44	35	36	12	2	185
2006	1	7	6	28	23	7	6	0	78
Total	15	37	181	264	135	99	42	31	805

	2002	2003	2004	2005	2006
Lowest:	0.5	1.0	0.6	1.6	0.9
Highest:	13.2	32.5	48.9	16.6	6.7
Mean:	3.9	4.1	3.9	4.0	3.9
Median:	3.5	3.4	3.2	3.7	3.9

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	3	4	22	31	16	13	7	4	100
2003	0	7	18	46	14	6	2	6	100
2004	5	6	26	35	10	9	2	7	100
2005	0	1	29	24	19	19	6	1	100
2006	1	9	8	36	29	9	8	0	100
Total	2	5	22	33	17	12	5	4	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	Un-known	Total
2002	0	2	0	6	6	13	9	8	1	0	0	45
2003	0	0	2	5	6	9	12	7	1	0	0	42
2004	0	1	2	10	5	15	20	8	0	0	1	62
2005	0	3	1	2	4	9	10	9	5	0	0	43
2006	1	0	8	12	9	5	13	7	3	0	0	58
Total	1	6	13	35	30	51	64	39	10	0	1	250

	2002	2003	2004	2005	2006
Lowest:	4.8	5.1	4.9	4.6	3.9
Highest:	8.0	8.0	7.9	8.4	8.4
Mean:	-	-	-	-	-
Median:	6.7	6.8	6.9	7.0	6.3

pH of homeowner of 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	Un-known	Total
2002	0	4	0	13	13	29	20	18	2	0	0	100
2003	0	0	5	12	14	21	29	17	2	0	0	100
2004	0	2	3	16	8	24	32	13	0	0	2	100
2005	0	7	2	5	9	21	23	21	12	0	0	100
2006	2	0	14	21	16	9	22	12	5	0	0	100
Total	0	2	5	14	12	20	20	16	4	0	0	100

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	4	4	13	43	85	91	42	6	0	0	288
2003	2	2	8	12	44	41	11	4	1	0	125
2004	0	1	2	16	58	42	8	1	1	0	129
2005	0	0	8	27	62	49	35	3	1	0	185
2006	0	0	11	18	31	16	2	0	0	0	78
Total	6	7	42	116	280	239	98	14	3	0	805

	2002	2003	2004	2005	2006
Lowest:	4.3	3.8	4.7	5.1	5.1
Highest:	7.7	8.0	8.0	8.4	7.1
Mean:	-	-	-	-	-
Median:	6.4	6.4	6.3	6.4	6.1

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	1	1	5	15	30	32	15	2	0	0	100
2003	2	2	6	10	35	33	9	3	1	0	100
2004	0	1	2	12	45	33	6	1	1	0	100
2005	0	0	4	15	34	26	19	2	1	0	100
2006	0	0	14	23	40	21	3	0	0	0	100
Total	1	1	5	14	35	30	12	2	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	
2002	0	8	6	21	2	4	1	0	1	2	45
2003	0	2	6	19	3	3	3	3	0	3	42
2004	0	3	8	29	7	3	2	3	3	4	62
2005	0	5	4	14	3	0	2	4	2	9	43
2006	0	1	10	28	3	3	1	6	0	6	58
Total	0	19	34	111	18	13	9	16	6	24	250

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

	2002	2003	2004	2005	2006
Lowest:	2	1	2	2	2
Highest:	575	733	494	992	1818
Mean:	42	67	57	118	105
Median:	14	24	21	37	22

Phosphorus in homeowner 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	18	13	47	4	9	2	0	2	4	100
2003	0	5	14	45	7	7	7	7	0	7	100
2004	0	5	13	47	11	5	3	5	5	6	100
2005	0	12	9	33	7	0	5	9	5	21	100
2006	0	2	17	48	5	5	2	10	0	10	100
Total	0	8	14	44	7	5	4	6	2	10	100

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

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	123	52	90	11	5	3	2	2	0	288
2003	0	78	20	24	1	0	0	1	0	1	125
2004	0	56	30	26	7	8	0	1	0	1	129
2005	0	84	54	37	5	2	0	1	0	2	185
2006	0	50	15	12	1	0	0	0	0	0	78
Total	0	391	171	189	25	15	3	5	2	4	805

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

	2002	2003	2004	2005	2006
Lowest:	1	1	1	1	1
Highest:	164	1071	440	775	45
Mean:	13	15	17	14	6
Median:	5	3	4	4	2

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	43	18	31	4	4	2	1	1	0	100
2003	0	62	16	19	1	1	0	1	0	1	100
2004	0	43	23	20	5	5	6	1	0	1	100
2005	0	45	29	20	3	3	1	1	0	1	100
2006	0	64	19	15	1	1	0	0	0	0	100
Total	0	49	21	23	3	3	2	1	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	
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 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
2002	0	0	1	2	10	13
2003	0	1	1	3	10	15
2004	0	1	1	2	21	25
2005	0	0	0	5	9	14
2006	0	0	0	4	4	8
Total (#)	0	2	3	16	54	75
Total (%)	0	3	4	21	72	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	0	1	5	4	4	14
2003	0	0	0	2	5	7
2004	0	0	1	4	4	9
2005	0	0	1	0	6	7
2006	0	1	1	1	4	7
Total (#)	0	2	8	11	23	44
Total (%)	0	5	18	25	52	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	5	6
2003	2	0	1	3	8	14
2004	0	1	5	2	5	13
2005	0	1	1	1	2	5
2006	0	3	1	7	6	17
Total (#)	2	5	8	14	26	55
Total (%)	4	9	15	25	47	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
2002	1	4	5	0	2	12
2003	0	3	1	1	1	6
2004	1	5	7	2	0	15
2005	0	6	4	3	4	17
2006	5	9	5	5	2	27
Total (#)	7	27	22	11	9	76
Total (%)	9	36	29	14	12	100
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 (%)	-	-	-	-	-	-

Potassium classification summary for homeowners:

Summary (#)	Very Low	Low	Medium	High	Very High	Total
2002	1	5	11	7	21	45
2003	2	4	3	9	24	42
2004	1	7	14	10	30	62
2005	0	7	6	9	21	43
2006	5	13	7	17	16	58
Grand Total	9	36	41	52	112	250

Summary (%)	Very Low	Low	Medium	High	Very High	Total
2002	2	11	24	16	47	100
2003	5	10	7	21	57	100
2004	2	11	23	16	48	100
2005	0	16	14	21	49	100
2006	9	22	12	29	28	100
Grand Total	4	14	16	21	45	100

	2002	2003	2004	2005	2006
Lowest:	58	37	54	68	23
Highest:	6483	21503	3256	6880	16495
Mean:	427	787	316	473	763
Median:	176	223	183	226	157

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	0	0	0
2003	0	0	0	0	0	0
2004	0	0	0	1	0	1
2005	0	0	0	0	0	0
2006	0	0	0	0	0	0
Total (#)	0	0	0	1	0	1
Total (%)	0	0	0	100	0	100
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
2002	2	29	37	39	49	156
2003	0	25	35	24	11	95
2004	0	7	23	29	18	77
2005	0	15	31	44	32	122
2006	0	1	14	13	11	39
Total (#)	2	77	140	149	121	489
Total (%)	0	16	29	30	25	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	3	18	20	14	14	69
2003	0	2	3	10	4	19
2004	0	7	8	10	6	31
2005	0	3	17	18	9	47
2006	2	9	9	4	3	27
Total (#)	5	39	57	56	36	193
Total (%)	3	20	30	29	19	100

Rao, R., T. Gallagher, Q.M. Ketterings, and H. Krol (2007). Albany Soil Sample Survey (2002-2006). CSS Extension Bulletin E07-17. 34 pages.

Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
2002	2	6	10	12	9	39
2003	1	2	0	1	0	4
2004	2	2	1	4	3	12
2005	0	3	3	4	5	15
2006	0	1	1	0	0	2
Total (#)	5	14	15	21	17	72
Total (%)	7	19	21	29	24	100

Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
2002	10	5	3	3	3	24
2003	0	1	2	3	0	6
2004	0	2	1	2	1	6
2005	0	0	0	0	0	0
2006	0	2	5	0	0	7
Total (#)	10	10	11	8	4	43
Total (%)	23	23	26	19	9	100

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	1	1	0	2
Total (#)	0	0	1	1	0	2
Total (%)	0	0	50	50	0	100

Potassium classification summary for commercial samples.

Summary (#)	Very Low	Low	Medium	High	Very High	Un-known	Total
2002	17	58	70	68	75	0	288
2003	1	30	40	38	15	1	125
2004	2	18	33	46	28	2	129
2005	0	21	51	66	46	1	185
2006	2	13	30	18	14	1	78
Grand Total	22	140	224	236	178	5	805

Summary (%)	Very Low	Low	Medium	High	Very High	Un-known	Total
2002	6	20	24	24	26	0	100
2003	1	24	32	30	12	1	100
2004	2	14	26	36	22	2	100
2005	0	11	28	36	25	1	100
2006	3	17	38	23	18	1	100
Grand Total	3	17	28	29	22	1	100

	2002	2003	2004	2005	2006
Lowest:	25	41	43	51	33
Highest:	1034	11019	3317	8380	355
Mean:	160	208	176	217	124
Median:	114	95	110	122	107

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	
2002	0	0	3	8	34	45
2003	0	0	1	10	31	42
2004	0	3	5	11	43	62
2005	0	2	1	8	32	43
2006	6	5	6	13	28	58
Total	6	10	16	50	168	250

	2002	2003	2004	2005	2006
Lowest:	66	96	54	46	1
Highest:	2825	3896	1647	1809	3662
Mean:	431	452	387	498	408
Median:	320	312	340	362	199

Magnesium in homeowner 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	7	18	76	100
2003	0	0	2	24	74	100
2004	0	5	8	18	69	100
2005	0	5	2	19	74	100
2006	10	9	10	22	48	100
Total	2	4	6	20	67	100

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	7	12	8	78	183	288
2003	0	4	7	45	69	125
2004	1	4	4	34	86	129
2005	0	0	0	69	116	185
2006	2	5	3	20	48	78
Total	10	25	22	246	502	805

	2002	2003	2004	2005	2006
Lowest:	12	30	15	106	12
Highest:	991	3024	836	2561	516
Mean:	269	252	266	267	223
Median:	240	209	250	228	217

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	2	4	3	27	64	100
2003	0	3	6	36	55	100
2004	1	3	3	26	67	100
2005	0	0	0	37	63	100
2006	3	6	4	26	62	100
Total	1	3	3	31	62	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	
2002	44	1	45
2003	38	4	42
2004	55	7	62
2005	42	1	43
2006	54	4	58
Total	233	17	250

Percentages:

	0-49	>49	Total
	Normal	Excessive	
	98	2	100
	90	10	100
	89	11	100
	98	2	100
	93	7	100
	93	7	100

	2002	2003	2004	2005	2006
Lowest:	1	2	1	2	2
Highest:	62	108	110	79	95
Mean:	12	22	18	16	17
Median:	7	14	8	12	11

10.2 Commercial Samples

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

Total number of samples:

	0-49	>49	Total
	Normal	Excessive	
2002	272	16	288
2003	120	5	125
2004	122	7	129
2005	176	9	185
2006	75	3	78
Total	765	40	805

Percentages:

	0-49	>49	Total
	Normal	Excessive	
	94	6	100
	96	4	100
	95	5	100
	95	5	100
	96	4	100
	95	5	100

	2002	2003	2004	2005	2006
Lowest:	1	1	1	1	2
Highest:	168	390	116	151	64
Mean:	10	14	14	13	17
Median:	4	5	6	7	12

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	
2002	43	2	45	96	4	100
2003	40	2	42	95	5	100
2004	55	7	62	89	11	100
2005	36	7	43	84	16	100
2006	53	5	58	91	9	100
Total	227	23	250	91	9	100

	2002	2003	2004	2005	2006
Lowest:	9	12	8	6	1
Highest:	228	242	400	239	383
Mean:	43	46	50	63	44
Median:	36	36	33	45	27

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	286	2	288	99	1	100
2003	122	3	125	98	2	100
2004	127	2	129	98	2	100
2005	184	1	185	99	1	100
2006	78	0	78	100	0	100
Total	797	8	805	99	1	100

	2002	2003	2004	2005	2006
Lowest:	2	5	6	11	8
Highest:	187	180	124	160	92
Mean:	25	28	25	28	29
Median:	21	22	21	23	24

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	
2002	0	2	43	45
2003	1	7	34	42
2004	2	9	51	62
2005	0	4	39	43
2006	2	6	50	58
Total	5	28	217	250

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
0	4	96	100
2	17	81	100
3	15	82	100
0	9	91	100
3	10	86	100
2	11	87	100

	2002	2003	2004	2005	2006
Lowest:	0.9	0.4	0.1	0.5	0.2
Highest:	106.9	170.9	34.8	32.4	23.3
Mean:	7.0	908	5.5	7.8	4.9
Median:	2.3	207	2.1	6.1	2.8

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	26	92	170	288
2003	18	65	42	125
2004	24	55	50	129
2005	38	61	86	185
2006	11	29	38	78
Total	117	302	386	805

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
9	32	59	100
14	52	34	100
19	43	39	100
21	33	46	100
14	37	49	100
15	38	48	100

	2002	2003	2004	2005	2006
Lowest:	0.1	0.1	0.1	0.1	0.1
Highest:	25.0	12.6	8.6	11.9	9.1
Mean:	1.7	1.5	1.2	1.3	1.4
Median:	1.2	0.9	0.8	1.0	1.0

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

Crop Code	Crop Description
BDR/DND	Beans-dry
BLU	Blueberries
CEM	Cemetery
FAR	Fairway
FLA	Flowering annuals
GRA	Grapes
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	Turf
TRT	Christmas trees, Topdressing