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Schuyler Co.

Samples analyzed by CNAL in 1995-2001

Summary compiled by

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Nutrient Management Spear Program: http://nmsp.css.cornell.edu/

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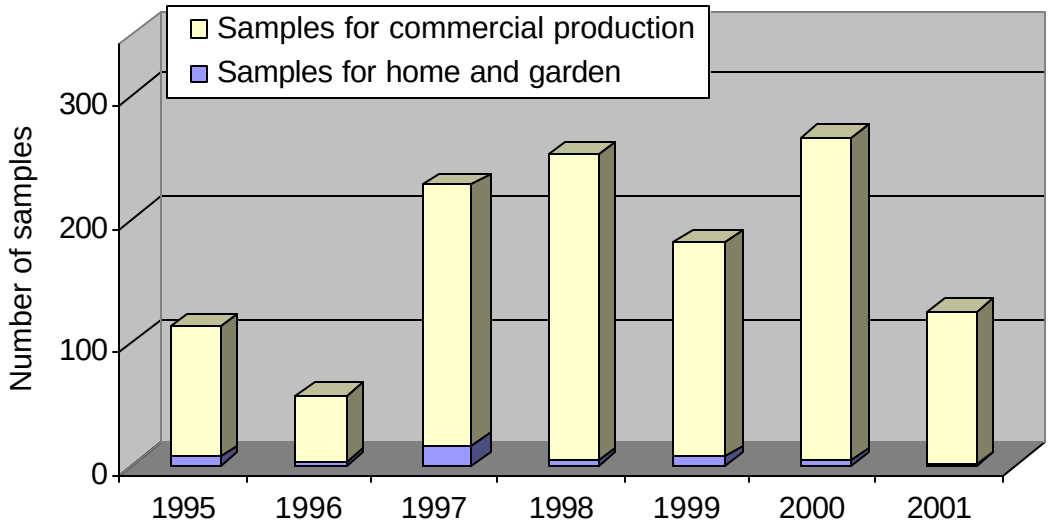
1. General Survey Summary

This survey summarizes the soil test results from Schuyler County soil samples submitted for analyses to the Cornell Nutrient Analysis Laboratory (CNAL) during 1995-2001. The total number of samples analyzed in these years amounted to 1223. Of these 1223 samples, 1177 (96%) were submitted to obtain fertilizer recommendations for commercial production while 46 samples (4%) were submitted as home and garden samples.



Homeowners		Commercial		Total
1995	7	1995	106	113
1996	4	1996	53	57
1997	17	1997	210	227
1998	5	1998	247	252
1999	7	1999	175	182
2000	5	2000	261	266
2001	1	2001	125	126
Total	46	Total	1177	1223

Most of the home and garden samples were submitted to obtain recommendations for home garden vegetable production, perennials and lawns. People submitting samples for commercial production requested fertilizer recommendations for corn grain and/or silage (31%), alfalfa, alfalfa/grass or alfalfa/trefoil mixtures (22%), grapes (17%), or pasture (7%), while a few producers were planning on growing other crops including clover/grass mixtures, apples, small grains and vegetables.

Home and garden samples in Schuyler County were mostly sandy loam soils belonging to soil management group 4 (23 out of 46 samples). Nine samples each were classified as silty and silt loams, while 5 samples belonged to soil management group 5 (sandy soils). The table below gives descriptions of each of the soil management groups.

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 for commercial production, 56% belonged to soil management group 3. Two percent were from soil management group 4. None of the samples belonged to either group 5 or 6 while 6% belonged to group 1 and 35% were classified as soil management group 2. The five most common soil series were Mardin (15%), Conesus

(12%), Volusia (11%), Lansing (10%) and Howard (7%). These soils represent 16% (Mardin), 3% (Conesus), 15% (Volusia), 2% (Lansing) and 4% (Howard) of the total 221,800 acres in the county.

Organic matter levels, as measured by loss on ignition, ranged from less than 1% to over 50% for one sample with median values ranging from 3.5 to 5.3% organic matter for home and garden samples (excluding the one sample submitted in 2001), and from 3.4 to 3.9% for samples submitted for commercial production. Twenty-five of the 46 home and garden samples had between 2 and 5% organic matter with 4 testing between 2 and 2.9% organic matter, 10 between 3.0 and 3.9% organic matter and 11% between 4.0 and 4.9% organic matter. Of the samples submitted for commercial production, 48% contained between 3 and 4% organic matter, 27% tested between 4.0 and 4.9% while 5% had organic matter concentrations of 5.0-5.9%. In total, 33% of the samples had organic matter levels between 4.0 and 6.9% while the remainder tested lower in organic matter.

Soil pH in water (1:1 extraction ratio) varied from pH 4.0 to 9.1 with the median for home and garden samples ranging from pH 5.9 to pH 7.2 (excluding 2001) and for samples submitted for commercial production ranging from pH 6.0 to pH 6.2. Of the home and garden samples, 65% tested between pH 6.0 and 7.4. For the samples submitted for commercial production, this was 61% while 32% tested between pH 5.0 and pH 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 solution and extraction method (Morgan, 1941). This solution contains sodium acetate buffered at a 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 soils with >39 lbs P/acre are classified as very high. Of the home and garden samples, 4 tested low, 7 tested medium, 12 tested high and 23 tested very high. This meant that 76% tested high or very high in P. Phosphorus levels for samples for commercial production in Schuyler County were skewed towards low and medium levels. Three percent of the samples tested very high in P. Thirty percent were low in P, 33% tested medium for P while 34% of the submitted samples were classified as high in soil

test P. This means that 37% tested high or very high in P and. There were no clear trends in P levels over the 7 years.

Classifications for potassium depend on soil management group. The fine-textured soils of 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 low, 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 the table below).

Potassium classifications depend on soil test K levels and soil management group.

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

Of the home and garden samples, 5 were classified as very low or low in potassium. Four samples tested medium, 13 were high and 24 were very high in potassium. For samples submitted for commercial production, 1% tested very low in K, 6% tested low, 19% tested medium, 34% tested high and 40% tested very high in potassium. As with phosphorus, there were no trends over the 7 years of soil sampling.

Soils test very low for magnesium 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 magnesium. 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 20 to almost 3000 lbs Mg/acre (Morgan extraction).

There were no samples that tested very low in Mg. Most soils tested high or very high for Mg (all of the homeowner soils and 96% of the soils of the commercial growers). Thus, magnesium deficiency is not likely to occur in Schuyler County provided the soil pH is maintained in the desirable range.

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 fell for 93-100% in the normal range with 7% of the samples for commercial production testing excessive for Fe. Similarly, most soils (93-99%) for both groups 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 zinc 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 home and garden samples, 38 samples tested high for zinc while 5 were low and 3 were medium in Zn. Of the samples for commercial production, 3% tested low in zinc, 29% tested medium while 68% of the samples were high in zinc.

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 2.

Reference

- Morgan, M.F. 1941. Chemical soil diagnosis by the universal soil testing system. Connecticut Agricultural Experimental Station. Bulletin 450.

2. Cropping Systems

2.1 Samples for Home and Garden

Crops for which recommendations are requested by homeowners:

	1995	1996	1997	1998	1999	2000	2001	Total	%
ALG	0	0	1	0	0	0	0	1	2
GEN	0	0	0	0	0	2	0	2	4
LAW	1	1	1	1	2	1	0	7	15
MVG	3	2	7	1	2	2	0	17	37
PER	0	1	4	3	1	0	1	10	22
PTO	1	0	0	0	0	0	0	1	2
RSP	0	0	0	0	1	0	0	1	2
SAG	0	0	4	0	1	0	0	5	11
Unknown	2	0	0	0	0	0	0	2	4
Total	7	4	17	5	7	5	1	46	100

Notes:

See Appendix for Cornell crop codes.

2.2 Samples for Commercial Production

Crops for which recommendations are requested for commercial production:

Current year crop	1995	1996	1997	1998	1999	2000	2001	Total	%
ABE/ABT	6	8	7	8	3	1	1	34	3
AGE/AGT	3	5	7	28	23	17	25	108	9
ALE/ALT	5	0	22	27	19	39	11	123	10
APP	2	1	1	1	0	0	1	6	1
BCE/BCT	0	0	0	4	1	0	5	10	1
BGE/BGT	4	2	4	0	0	0	0	10	1
BLB	10	0	3	0	0	1	1	15	1
BSE	1	0	0	0	0	0	0	1	0
BSP	6	0	9	8	3	7	0	33	3
BUK	0	0	3	0	0	0	0	3	0
CGE/CGT	1	0	2	3	1	3	3	13	1
CHT	0	0	0	0	0	1	0	1	0
CLE/CLT	1	0	3	2	7	0	0	13	1
COG/COS	39	18	81	83	45	85	18	369	31
GIE/GIT	0	0	1	0	1	0	0	2	0
GPA	0	0	2	9	4	31	2	48	4
GPF	0	0	1	22	13	10	5	51	4
GPV	5	0	10	20	19	41	10	105	9
GRE/GRT	14	0	22	5	13	3	3	60	5
IDL	0	0	0	0	0	1	1	2	0
MIX	0	1	1	0	0	3	0	5	0
OAS	1	3	0	7	8	1	0	20	2
OAT	1	1	0	3	1	3	3	12	1
OTH	0	0	0	1	0	0	0	1	0
PCH	0	0	0	0	1	0	0	1	0
PGE/PGT	0	0	0	0	0	0	1	1	0
PIE/PIT	2	0	20	0	8	1	26	57	5
PLE/PLT	0	0	5	5	0	1	0	11	1
PLM	0	0	0	0	1	0	0	1	0
PNE/PNT	1	0	0	0	4	1	0	6	1
RSS	1	1	0	0	0	0	0	2	0
RYC	0	0	0	0	0	3	0	3	0
RYS	0	0	0	1	0	0	0	1	0
SOY	1	2	0	1	0	4	0	8	1
STS	0	1	1	0	0	0	1	3	0

Current year crop	1995	1996	1997	1998	1999	2000	2001	Total	%
SUN	0	0	0	0	0	0	1	1	0
SWC	0	0	0	0	0	1	0	1	0
TRE/TRT	1	0	3	3	0	0	1	8	1
WHS	0	0	0	1	0	1	0	2	0
WHT	1	9	1	4	0	2	5	22	2
Unknown	0	1	1	1	0	0	1	4	0
Total	106	53	210	247	175	261	125	1177	100

Notes:

See Appendix for Cornell crop codes.

3. Soil Types

3.1 Samples for Home and Garden

Soil types (soil management groups) for home and garden samples:

	1995	1996	1997	1998	1999	2000	2001	Total
SMG 1 (clayey)	0	0	0	0	0	0	0	0
SMG 2 (silty)	2	1	4	1	1	0	0	9
SMG 3 (silt loam)	3	1	1	0	3	1	0	9
SMG 4 (sandy loam)	2	2	11	4	2	1	1	23
SMG 5 (sandy)	0	0	1	0	1	3	0	5
SMG 6 (mucky)	0	0	0	0	0	0	0	0
Total	7	4	17	5	7	5	1	46

3.2 Samples for Commercial Production

Soil series for samples submitted for commercial production:

Name	SMG	1995	1996	1997	1998	1999	2000	2001	Total
Alden	3	0	0	0	0	1	0	0	1
Angola	2	1	0	4	1	2	3	0	11
Appleton	2	1	1	2	8	22	14	3	51
Arnot	3	0	1	0	0	0	0	1	2
Aurora	2	0	0	1	0	0	0	0	1
Bath	3	1	0	1	0	0	1	0	3
Burdett	2	1	0	5	1	5	1	1	14
Castile	4	2	4	3	1	0	6	2	18
Chenango	3	4	4	10	7	3	18	6	52
Collamer	3	2	0	3	4	2	11	4	26
Conesus	2	12	6	24	29	22	33	14	140
Dunkirk	3	0	0	1	0	0	0	1	2
Erie	3	5	3	26	20	0	19	2	75
Fremont	2	0	0	1	0	1	1	0	3
Howard	3	7	2	17	17	15	17	10	85
Hudson	2	4	0	0	7	1	11	5	28
Lansing	2	4	3	5	43	26	20	17	118
Lordstown	3	2	1	1	12	8	4	2	30
Madalin	1	1	0	0	0	2	5	1	9
Mardin	3	20	12	32	44	35	30	9	182
Odessa	2	1	0	0	1	0	1	2	5
Philo	3	0	0	0	0	1	2	0	3
Red Hook	4	1	0	1	0	1	1	0	4
Rhinebeck	2	6	0	10	12	2	6	3	39
Schoharie	1	6	2	10	6	0	25	10	59
Teel	2	0	0	0	0	2	1	1	4
Tuller	3	0	0	3	0	0	0	0	3
Valois	3	4	6	12	9	13	14	6	64
Volusia	3	21	8	34	23	11	15	21	133
Unknown	-	0	0	4	2	0	2	4	12
Total	-	106	53	210	247	175	261	125	1177

4. Organic Matter

4.1 Samples for Home and Garden

Number of home and garden samples within each % organic matter range:

	<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
1995	0	0	1	2	3	1	0	0	7
1996	0	1	0	1	1	0	0	1	4
1997	0	0	2	3	2	3	1	6	17
1998	0	1	1	1	1	0	0	1	5
1999	0	0	0	2	3	2	0	0	7
2000	2	0	0	1	1	0	1	0	5
2001	0	1	0	0	0	0	0	0	1
Total	2	3	4	10	11	6	2	8	46

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	2.5	1.8	2.5	1.6	3.3	0.2	1.9	
Highest:	5.8	7.8	21.6	9.5	5.7	6.5	1.9	
Mean:	4.0	4.3	7.2	4.2	4.5	3.0	1.9	
Median:	4.1	3.7	5.3	3.5	4.7	3.8	1.9	

Percent of home and garden samples within each % organic matter range:

	<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
1995	0	0	14	29	43	14	0	0	100
1996	0	25	0	25	25	0	0	25	100
1997	0	0	12	18	12	18	6	35	100
1998	0	20	20	20	20	0	0	20	100
1999	0	0	0	29	43	29	0	0	100
2000	40	0	0	20	20	0	20	0	100
2001	0	100	0	0	0	0	0	0	100
Total	4	7	9	22	24	13	4	17	100

4.2 Samples for Commercial Production

Number of samples for commercial production within each % organic matter range:

	<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
1995	0	3	7	48	34	10	4	0	106
1996	0	0	7	28	12	4	1	1	53
1997	1	0	28	99	66	13	2	1	210
1998	0	0	54	126	58	7	1	1	247
1999	0	5	29	76	53	10	2	0	175
2000	0	5	57	128	59	11	0	1	261
2001	0	2	16	63	33	9	1	1	125
Total	1	15	198	568	315	64	11	5	1177

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	1.8	2.1	0.1	2.0	1.5	1.6	1.4	
Highest:	6.5	57.8	7.4	7.9	6.6	7.7	7.3	
Mean:	4.0	4.8	3.8	3.5	3.7	3.5	3.8	
Median:	3.9	3.7	3.8	3.4	3.7	3.4	3.7	

Percent of samples for commercial production within each % organic matter range:

	<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
1995	0	3	7	45	32	9	4	0	100
1996	0	0	13	53	23	8	2	2	100
1997	0	0	13	47	31	6	1	0	100
1998	0	0	22	51	23	3	0	0	100
1999	0	3	17	43	30	6	1	0	100
2000	0	2	22	49	23	4	0	0	100
2001	0	2	13	50	26	7	1	1	100
Total	0	1	17	48	27	5	1	0	100

5. pH

5.1 Samples for Home and Garden

Number of home and garden samples within each pH range:

	<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
1995	0	0	0	2	1	2	1	1	0	0	7
1996	0	0	0	0	0	1	2	1	0	0	4
1997	0	0	0	1	1	8	6	1	0	0	17
1998	0	0	0	0	2	1	1	1	0	0	5
1999	0	0	0	1	1	2	1	2	0	0	7
2000	0	0	0	3	0	0	0	1	0	1	5
2001	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	7	5	14	11	8	0	1	46

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	5.5	6.9	5.5	6.4	5.5	5.8	7.8	
Highest:	7.6	7.5	7.6	7.6	7.8	8.6	7.8	
Mean:	-	-	-	-	-	-	-	
Median:	6.7	7.2	6.9	6.7	6.7	5.9	7.8	

Percent of home and garden samples within each pH range:

	<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
1995	0	0	0	29	14	29	14	14	0	0	100
1996	0	0	0	0	0	25	50	25	0	0	100
1997	0	0	0	6	6	47	35	6	0	0	100
1998	0	0	0	0	40	20	20	20	0	0	100
1999	0	0	0	14	14	29	14	29	0	0	100
2000	0	0	0	60	0	0	0	20	0	20	100
2001	0	0	0	0	0	0	0	100	0	0	100
Total	0	0	0	15	11	30	24	17	0	2	100

5.2 Samples for Commercial Production

Number of samples for commercial production within each pH range:

	<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
1995	1	4	9	24	29	34	5	0	0	0	106
1996	0	1	4	12	26	7	1	1	0	1	53
1997	1	6	24	49	80	49	1	0	0	0	210
1998	1	17	19	59	83	59	9	0	0	0	247
1999	7	13	9	48	70	26	2	0	0	0	175
2000	11	13	26	50	66	75	16	4	0	0	261
2001	3	4	10	25	44	32	7	0	0	0	125
Total	24	58	101	267	398	282	41	5	0	1	1177

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	4.2	4.9	4.2	4.4	4.1	4.0	3.6	
Highest:	7.4	9.1	7.2	7.4	7.4	7.9	7.2	
Mean:	-	-	-	-	-	-	-	
Median:	6.2	6.1	6.1	6.1	6.0	6.2	6.2	

Percent of samples for commercial production within each pH range:

	<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
1995	1	4	8	23	27	32	5	0	0	0	100
1996	0	2	8	23	49	13	2	2	0	2	100
1997	0	3	11	23	38	23	0	0	0	0	100
1998	0	7	8	24	34	24	4	0	0	0	100
1999	4	7	5	27	40	15	1	0	0	0	100
2000	4	5	10	19	25	29	6	2	0	0	100
2001	2	3	8	20	35	26	6	0	0	0	100
Total	2	5	9	23	34	24	3	0	0	0	100

6. Phosphorus

6.1 Samples for Home and Garden

Number of home and garden samples within each range Morgan extractable P range (lbs/acre Morgan P):

	<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	
1995	0	3	1	1	2	0	0	0	0	0	7
1996	0	0	1	0	2	0	0	0	1	0	4
1997	0	0	2	5	2	0	1	1	0	6	17
1998	0	0	1	1	1	0	2	0	0	0	5
1999	0	0	1	3	0	2	1	0	0	0	7
2000	0	1	1	2	0	0	1	0	0	0	5
2001	0	0	0	0	1	0	0	0	0	0	1
Total	0	4	7	12	8	2	5	1	1	6	46

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

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	1	5	4	7	8	1	41	
Highest:	57	196	655	95	87	86	41	
Mean:	20	72	187	50	40	32	41	
Median:	7	43	45	43	20	31	41	

Percent of home and garden samples within each Morgan extractable phosphorus range:

	<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	
1995	0	43	14	14	29	0	0	0	0	0	100
1996	0	0	25	0	50	0	0	0	25	0	100
1997	0	0	12	29	12	0	6	6	0	35	100
1998	0	0	20	20	20	0	40	0	0	0	100
1999	0	0	14	43	0	29	14	0	0	0	100
2000	0	20	20	40	0	0	20	0	0	0	100
2001	0	0	0	0	100	0	0	0	0	0	100
Total	0	9	15	26	17	4	11	2	2	13	100

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

6.2 Samples for Commercial Production

Number of samples submitted for commercial production within each Morgan extractable phosphorus (lbs P/acre) range:

	<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	
1995	0	33	35	32	5	1	0	0	0	0	106
1996	0	14	23	14	1	0	0	0	0	1	53
1997	0	67	59	78	4	1	0	1	0	0	210
1998	0	57	88	91	9	1	0	1	0	0	247
1999	0	65	60	46	3	0	1	0	0	0	175
2000	0	74	90	91	3	1	1	1	0	0	261
2001	0	42	33	44	4	2	0	0	0	0	125
Total	0	352	388	396	29	6	2	3	0	1	1177

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

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	1	1	1	1	1	1	1	
Highest:	76	1373	114	113	89	138	64	
Mean:	11	33	10	11	8	10	11	
Median:	6	7	6	7	5	6	7	

Percent of samples submitted for commercial production within each Morgan P range:

	<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	
1995	0	31	33	30	5	1	0	0	0	0	100
1996	0	26	43	26	2	0	0	0	0	2	100
1997	0	32	28	37	2	0	0	0	0	0	100
1998	0	23	36	37	4	0	0	0	0	0	100
1999	0	37	34	26	2	0	1	0	0	0	100
2000	0	28	34	35	1	0	0	0	0	0	100
2001	0	34	26	35	3	2	0	0	0	0	100
Total	0	30	33	34	2	1	0	0	0	0	100

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

7. Potassium

7.1 Samples for Home and Garden

Number of home and garden samples within each K range (lbs K/acre Morgan extraction):

Soil Management Group 1						
	<35	35-64	65-94	95-149	>149	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	0	0	0	0	0	0
2000	0	0	0	0	0	0
2001	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	
1995	0	0	0	1	1	2
1996	0	0	0	0	1	1
1997	0	0	0	1	3	4
1998	0	0	0	1	0	1
1999	0	0	0	0	1	1
2000	0	0	0	0	0	0
2001	0	0	0	0	0	0
Total (#)	0	0	0	3	6	9
Total (%)	0	0	0	33	67	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	0	1	2	3
1996	1	0	0	0	0	1
1997	0	0	0	0	1	1
1998	0	0	0	0	0	0
1999	0	0	0	0	3	3
2000	0	0	0	0	1	1
2001	0	0	0	0	0	0
Total (#)	1	0	0	1	7	9
Total (%)	11	0	0	11	78	100

Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	1	0	1	2
1996	0	0	0	1	1	2
1997	0	1	2	2	6	11
1998	0	0	0	4	0	4
1999	0	0	0	2	0	2
2000	0	0	0	0	1	1
2001	0	0	1	0	0	1
Total (#)	0	1	4	9	9	23
Total (%)	0	4	17	39	39	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	1	0	0	0	1
1998	0	0	0	0	0	0
1999	0	0	0	0	1	1
2000	2	0	0	0	1	3
2001	0	0	0	0	0	0
Total (#)	2	1	0	0	2	5
Total (%)	40	20	0	0	40	100
Soil Management Group 6						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	0	0	0	0	0	0
2000	0	0	0	0	0	0
2001	0	0	0	0	0	0
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-

Number of home and garden samples within each potassium classification:

Summary (#)	Very Low	Low	Medium	High	Very High	Total
1995	0	0	1	2	4	7
1996	1	0	0	1	2	4
1997	0	2	2	3	10	17
1998	0	0	0	5	0	5
1999	0	0	0	2	5	7
2000	2	0	0	0	3	5
2001	0	0	1	0	0	1
Total #	3	2	4	13	24	46

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	140	43	94	137	215	42	114	
Highest:	589	3650	2310	211	500	956	114	
Mean:	262	1058	550	168	298	410	114	
Median:	200	265	388	159	260	323	114	

Percent of samples submitted for home and garden within each potassium classification.

Summary (%)	Very Low	Low	Medium	High	Very High	Total
1995	0	0	14	29	57	100
1996	25	0	0	25	50	100
1997	0	12	12	18	59	100
1998	0	0	0	100	0	100
1999	0	0	0	29	71	100
2000	40	0	0	0	60	100
2001	0	0	100	0	0	100
Grand Total	7	4	9	28	52	100

7.2 Samples for Commercial Production

Number of samples submitted for commercial production within each potassium (lbs K/acre Morgan extraction) range:

Soil Management Group 1						
	<35	35-64	65-94	95-149	>149	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	2	0	5	7
1996	0	0	1	0	1	2
1997	0	0	0	0	10	10
1998	0	0	1	2	3	6
1999	0	0	0	0	2	2
2000	0	0	2	5	23	30
2001	0	0	0	2	9	11
Total (#)	0	0	6	9	53	68
Total (%)	0	0	9	13	78	100
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
1995	0	2	7	11	10	30
1996	0	0	3	5	2	10
1997	0	1	7	18	26	52
1998	0	0	11	27	64	102
1999	1	1	13	31	37	83
2000	0	0	0	32	59	91
2001	0	0	7	20	19	46
Total (#)	1	4	48	144	217	414
Total (%)	0	1	12	35	52	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	0	6	25	25	20	76
1996	0	3	10	10	14	37
1997	0	18	37	53	32	140
1998	0	8	40	47	41	136
1999	5	7	21	36	20	89
2000	0	11	24	44	52	131
2001	0	6	17	25	14	62
Total (#)	5	59	174	240	193	671
Total (%)	1	9	26	36	29	100

Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	1	2	0	3
1996	0	0	0	0	4	4
1997	0	0	3	1	0	4
1998	0	0	0	0	1	1
1999	0	1	0	0	0	1
2000	0	1	1	3	2	7
2001	0	0	0	2	0	2
Total (#)	0	2	5	8	7	22
Total (%)	0	9	23	36	32	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	0	0	0	0	0	0
2000	0	0	0	0	0	0
2001	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	
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	0	0	0	0	0	0
2000	0	0	0	0	0	0
2001	0	0	0	0	0	0
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-

Number of samples submitted for commercial production within each potassium classification.

Summary (#)	Very Low	Low	Medium	High	Very High	Un-known	Total
1995	0	8	25	38	35	0	106
1996	0	3	14	15	21	0	53
1997	0	19	47	72	68	4	210
1998	0	8	52	76	109	2	247
1999	6	9	34	67	59	0	175
2000	0	12	27	84	136	2	261
2001	0	6	24	49	42	4	125
Grand Total	6	65	223	401	470	12	1177

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	54	53	46	48	18	47	61	
Highest:	833	29296	758	877	620	859	656	
Mean:	188	731	168	200	172	208	186	
Median:	140	156	149	165	144	189	150	

Percent of samples submitted for commercial production within each potassium classification.

% summary	Very Low	Low	Medium	High	Very High	Un-known	Total
1995	0	8	24	36	33	0	100
1996	0	6	26	28	40	0	100
1997	0	9	22	34	32	2	100
1998	0	3	21	31	44	1	100
1999	3	5	19	38	34	0	100
2000	0	5	10	32	52	1	100
2001	0	5	19	39	34	3	100
Grand Total	1	6	19	34	40	1	100

8. Magnesium

8.1 Samples for Home and Garden

Number of home and garden samples within each Mg range (lbs Morgan Mg/acre):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	0	0	7	7
1996	0	0	0	0	4	4
1997	0	0	0	1	16	17
1998	0	0	0	0	5	5
1999	0	0	0	0	7	7
2000	0	0	0	2	3	5
2001	0	0	0	0	1	1
Total	0	0	0	3	43	46

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	218	225	177	307	282	178	371	
Highest:	448	833	2837	887	516	580	371	
Mean:	341	449	660	621	409	320	371	
Median:	353	368	443	612	464	253	371	

Percent of home and garden samples within each Mg range (lbs Morgan Mg/acre):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	0	0	100	100
1996	0	0	0	0	100	100
1997	0	0	0	6	94	100
1998	0	0	0	0	100	100
1999	0	0	0	0	100	100
2000	0	0	0	40	60	100
2001	0	0	0	0	100	100
Total	0	0	0	7	93	100

8.2 Samples for Commercial Production

Number of samples submitted for commercial production within each Mg range (lbs Mg/acre Morgan extraction):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	0	5	5	5	91	106
1996	0	0	0	6	47	53
1997	0	0	1	20	189	210
1998	0	1	2	26	218	247
1999	0	10	6	14	145	175
2000	0	10	4	24	223	261
2001	0	2	1	13	109	125
Total	0	28	19	108	1022	1177

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	28	125	83	55	20	24	57	
Highest:	981	2210	850	890	784	786	803	
Mean:	367	411	384	373	341	368	402	
Median:	344	398	381	362	347	366	385	

Percent of samples submitted for commercial production within each magnesium range (lbs Mg/acre Morgan extraction):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	0	5	5	5	86	100
1996	0	0	0	11	89	100
1997	0	0	0	10	90	100
1998	0	0	1	11	88	100
1999	0	6	3	8	83	100
2000	0	4	2	9	85	100
2001	0	2	1	10	87	100
Total	0	2	2	9	87	100

9. Iron

9.1 Samples for Home and Garden

Iron (lbs Fe/acre Morgan extraction) in samples for home and garden:

Total number of samples:

	0-49	>49	Total
	Normal	Excessive	
1995	7	0	7
1996	4	0	4
1997	17	0	17
1998	5	0	5
1999	7	0	7
2000	5	0	5
2001	1	0	1
Total	46	0	46

Percentages:

0-49	>49	Total
Normal	Excessive	
100	0	100
100	0	100
100	0	100
100	0	100
100	0	100
100	0	100
100	0	100
100	0	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	2	3	2	3	1	2	3	
Highest:	31	7	33	34	25	11	3	
Mean:	12	5	7	13	8	6	3	
Median:	10	5	5	7	8	4	3	

9.2 Samples for Commercial Production

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

Total number of samples:

	0-49	>49	Total
	Normal	Excessive	
1995	102	4	106
1996	52	1	53
1997	200	10	210
1998	231	16	247
1999	156	19	175
2000	233	28	261
2001	117	8	125
Total	1091	86	1177

Percentages:

0-49	>49	Total
Normal	Excessive	
96	4	100
98	2	100
95	5	100
94	6	100
89	11	100
89	11	100
94	6	100
93	7	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	1	2	1	1	1	1	1	
Highest:	98	53	116	123	188	174	274	
Mean:	13	10	12	13	21	19	18	
Median:	6	6	7	6	8	6	6	

10. Manganese

10.1 Samples for Home and Garden

Manganese (lbs Mn/acre Morgan extraction) in samples for home and garden:

Total number of samples:

	0-99	>99	Total
	Normal	Excessive	
1995	7	0	7
1996	4	0	4
1997	15	2	17
1998	5	0	5
1999	6	1	7
2000	5	0	5
2001	1	0	1
Total	43	3	46

Percentages:

0-99	>99	Total
Normal	Excessive	
100	0	100
100	0	100
88	12	100
100	0	100
86	14	100
100	0	100
100	0	100
93	7	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	26	24	13	23	27	4	44	
Highest:	56	75	272	70	101	53	44	
Mean:	41	44	54	44	44	27	44	
Median:	38	38	30	43	35	27	44	

10.2 Samples for Commercial Production

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

Total number of samples:

	0-99	>99	Total
	Normal	Excessive	
1995	106	0	106
1996	52	1	53
1997	209	1	210
1998	244	3	247
1999	174	1	175
2000	260	1	261
2001	123	2	125
Total	1168	9	1177

Percentages:

0-99	>99	Total
Normal	Excessive	
100	0	100
98	2	100
100	0	100
99	1	100
99	1	100
100	0	100
98	2	100
99	1	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	7	10	10	11	11	4	11	
Highest:	92	106	142	233	123	132	167	
Mean:	31	36	36	32	34	30	28	
Median:	28	32	32	28	31	27	32	

11. Zinc

11.1 Samples for Home and Garden

Zinc (lbs Zn/acre Morgan extraction) in samples for home and garden:

Total number of samples:

	<0.5	0.5-1.0	>1	Total
	Low	Medium	High	
1995	0	2	5	7
1996	0	0	4	4
1997	3	1	13	17
1998	0	0	5	5
1999	0	0	7	7
2000	2	0	3	5
2001	0	0	1	1
Total	5	3	38	46

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
0	29	71	100
0	0	100	100
18	6	76	100
0	0	100	100
0	0	100	100
40	0	60	100
0	0	100	100
11	7	83	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	0.9	1.5	0.3	2.2	1.3	0.3	20.9	
Highest:	5.0	7.1	85.4	19.2	8.0	4.6	20.9	
Mean:	2.3	4.4	16.8	10.6	3.7	2.6	20.9	
Median:	1.7	4.6	9.3	11.5	2.6	3.5	20.9	

11.2 Samples for Commercial Production

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

Total number of samples:

	<0.5	0.5-1.0	>1	Total
	Low	Medium	High	
1995	3	55	48	106
1996	2	26	25	53
1997	7	65	138	210
1998	0	64	183	247
1999	11	45	119	175
2000	7	53	201	261
2001	2	39	84	123
Total	32	347	798	1177

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
3	52	45	100
4	49	47	100
3	31	66	100
0	26	74	100
6	26	68	100
3	20	77	100
2	31	67	100
3	29	68	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	0.3	0.4	0.2	0.5	0.1	0.1	0.4	
Highest:	3.1	8.8	14.9	11.0	6.1	21.4	12.5	
Mean:	1.1	1.4	1.6	2.0	1.6	2.1	2.0	
Median:	1.0	1.0	1.3	1.6	1.4	1.7	1.5	

Appendix: Cornell Crop Codes

Crop codes are used in the Cornell Nutrient Analyses 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
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
PNE	Pasture native grasses, Established
RYC	Rye cover crop
RYS	Rye seed production
TRP	Triticale peas
	Small grains
BSP	Barley, Spring
MIL	Millet
OAS	Oats 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

Crop Code	Crop Description
APR	Apricots
ASP	Asparagus
ATF	Athletic Field
BDR/BND	Beans-dry
BLU/BLB	Blueberries
CEM	Cemetery
CHT	Cherries, Tart
EGG	Eggplants
END	Endives
FAR	Fairway
FLA	Flowering Annuals
GEN	Green
GPA	Grapes, American
GPF	Grapes, French-American
GPV	Grapes, Vinifera
GRA	Grapes (homeowners)
HRB	Herbs
IDL	Idle land
LAW	Lawn
LET	Lettuce
MIX/MVG	Mixed vegetables
MML	Muskmelon
NUR	Nursery
ONS	Onion-seeded
OTH	Other
PAR	Pears
PCH	Peaches
PEP	Peppers
PER	Perennials
PLM	Plums
POP	Popcorn
PRK	Park
POT/PTO	Potatoes
PUM	Pumpkins
ROD	Roadside
ROS	Roses
ROU	Rough
RSF	Raspberries, Fall
RSP	Raspberries (homeowners)

Crop Code	Crop Description
RSS	Raspberries, Summer
SAG	Ornamentals adapted to pH 6.0 to 7.5
SQS	Squash, Summer
SQW	Squash, Winter
STE	Strawberries, Ever
STR	Strawberries (homeowners)
STS	Strawberries, Spring
SUN	Sunflowers
SWC	Sweet corn
TOM	Tomatoes
TRE	Christmas trees, Established
TRF	Tree fruits
TRT	Christmas trees, Topdressing