

Soil Sample Survey

Niagara Co.

Samples analyzed by CNAL in 1995-2001



Mark Ketch of Russell Farms
Appleton, NY

Apple production is important in Niagara County, especially on the glacial outwash soils close to Lake Ontario and along the streams draining to Lake Ontario. The cooling effect of the lake improves the chances for successful pollination in the spring plus contributes to flavor development in the fall. Soil testing is used regularly by commercial apple producers to optimize quality and quantity of production while minimizing the risk of nutrient losses to the environment.

Summary compiled by

Quirine M. Ketterings, Hettie Krol, W. Shaw Reid & Nathan Herendeen



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

Ketterings, Q.M., H. Krol, W.S. Reid and N. Herendeen (2003). Niagara County Soil Sample Survey 1995-2001. CSS Extension Bulletin E03-29. 40 pages.

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1. General Survey Summary

Niagara County is located in the northwest corner of New York, north of Buffalo. It is bordered by Lake Ontario on the north and Ontario, Canada on the west. It contains over 339,000 acres of land area. Roughly 50 % of the area is used for farm production.

Niagara County is noted for Niagara Falls where the north flowing Niagara River drops nearly 200 feet as it goes over the crest of the Niagara escarpment. The county lies entirely in the Ontario and Huron Lake Plains region. The northern lake plain begins at Lake Ontario, where the elevation is 246 feet above sea level. It extends to the foot of the Niagara escarpment. There the elevation increases sharply to crest of the escarpment, about 600 elevation. The Huron Plain part of the county extends from that crest southward into Erie County. It has a high point of 680 feet at Bunker Hill near the southeast corner of the county and a low of 575 feet at the mouth of Tonawanda Creek.

The soils in the north are dominated by glacial till that was greatly modified by glacial outwash and/or glacial lake sediments. The soils in the south are derived from high carbonate materials deposited by glacial advance across the Niagara dolomite limestone escarpment. However, glacial outwash materials and/or lacustrine sediments also modified much of this area.

Small areas of wetlands occur throughout the county, the result of massive glacial outwash during the period of glacial recession from western New York. Several small areas were drained and farmed as organic soils or muckland for many years. Most have been abandoned for agricultural purposes. Additional areas of wetlands are protected in the federal Iroquois Wildlife Refuge and the state Tonawanda Wildlife Area, in the southeast corner of the county. These areas are seasonal feeding and resting sites to many migratory waterfowl, especially Canada geese.

The agriculture of Niagara County is diverse. Dairy farming is the largest single generator of farm income. Livestock producers market beef, hogs and sheep from Niagara County. Thousands of acres are devoted to field and forage crops to support the dairy and livestock industry. Hay, grain and soybean crops not used locally are exported to areas throughout the eastern United States.

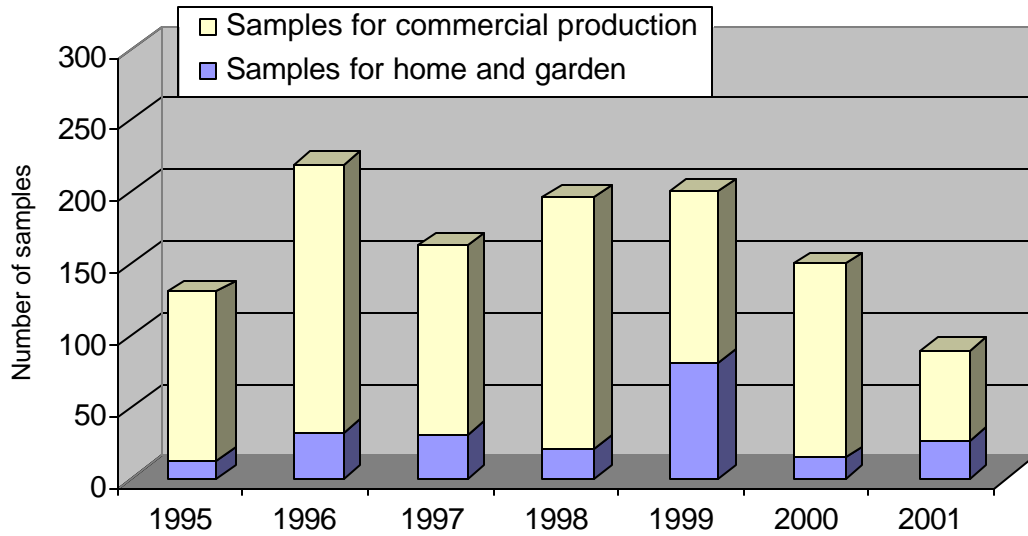
Tree fruit production is next in farm income creation, with large acreages of apples plus smaller acreages of cherries, peaches, pears and plums. Apples are stored, packed and marketed throughout the eastern US and overseas markets from Niagara County facilities.

Vegetable crops comprise the next largest segment of the agricultural economy. Crops grown for processing include peas, snap beans, sweet corn and dry beans. Fresh vegetables produced include all the above plus cabbage, potatoes, cucumbers, squash, pumpkins, peppers and tomatoes. Bedding plants and ornamentals are important commodities on farms with greenhouses and nursery stock. Small fruits such as strawberries and blueberries are grown for fresh market.

Niagara County has small and large dairy farms and several grass based dairy farms. There are a number of farms that have found niche markets for fresh produce and/or use their facilities for agri-tourism. The number of farms with recreational horse boarding and training facilities is on the increase.

All the above industries rely heavily on soil testing to maintain optimum production while protecting the agricultural environment from nutrient runoff. This survey summarizes the soil test results from Niagara 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 1146. Of these 1146 samples, 928 (81%) were submitted to obtain fertilizer recommendations for commercial production while 218 samples (19%) were submitted as home and garden samples.

Forty-nine percent of the home and garden soil samples were submitted to request fertilizer recommendations for lawns while others requested recommendations mostly for perennials and home garden vegetable production. People submitting samples for commercial production requested fertilizer recommendations for apple production (28%), corn grain or silage (15%), soybeans (8%), alfalfa, alfalfa/grass or alfalfa/trefoil mixtures (6%), while a few producers were planning on growing other crops including small grains, vegetables, and fruit trees.



Homeowners		Commercial		Total
1995	13	1995	117	130
1996	32	1996	187	219
1997	31	1997	131	162
1998	21	1998	175	196
1999	81	1999	120	201
2000	14	2000	135	149
<u>2001</u>	<u>26</u>	<u>2001</u>	<u>63</u>	<u>89</u>
Total	218	Total	928	1146

Home and garden samples in Niagara County were dominantly sandy loam soils belonging to soil management group 4 (44%). Twenty-five percent belonged to soil management group 2. Group 3 was represented by 22% of all samples and 9% was classified as sandy (soil management group 5). The following table on page 7 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, 49% belonged to soil management group 2. One percent was from soil management group 1. Twenty-seven percent belonged to soil management group 3 while 19% were classified group 4 and 4% were from group 5. The five most common soil series were Rhinebeck (11%), Hilton (11%), Collamer (10%), Odessa (8%) and Appleton (8%). These soils represent 2% (Rhinebeck), 9% (Hilton), 3% (Collamer), 8% (Odessa), and 9% (Appleton) of the total 334,170 acres in the county.

Organic matter levels, as measured by loss on ignition, ranged from less than 1% to almost 60% with median values ranging from 3.6 to 4.7% organic matter for home and garden samples and from 2.2 to 3.0 for samples submitted for commercial production. Sixty-three percent of the home and garden samples had between 2 and 5% organic matter with 15% testing between 2 and 2.9% organic matter, 23% between 3.0 and 3.9% organic matter and 25% between 4.0 and 4.9% organic matter. Thirty-one percent of the soils submitted for home and garden tested >4.9% in organic matter while 6% has less than 2% organic matter. Of the samples submitted for commercial production, 23%

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contained less than 2% organic matter, 40% percent of the samples had between 2 and 2.9% organic matter, 23% contained between 3 and 4% organic matter, 9% tested between 4.0 and 4.9% while 5% had organic matter concentrations of 5.0% or greater. In total, 84% of the samples had organic matter levels between 1.0 and 3.9%.

Soil pH in water (1:1 extraction ratio) varied from pH 3.4 to 8.5 with the median for home and garden samples ranging from pH 7.0 to pH 7.5 and for samples submitted for commercial production ranging from pH 6.1 to pH 6.5. Of the home and garden samples, 46% tested between pH 6.0 and 7.4 while 45% had a pH of 7.5 or greater. For the samples submitted for commercial production, 10% tested lower than pH 5.5.

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, 14% tested low, 23% tested medium, 34% tested high and 29% tested very high. This meant that 63% tested high or very high in P. Phosphorus levels for samples for commercial production in Niagara County were slightly lower than the state average (50% tests high or very high in P). Five percent of the samples tested very high in P. Twenty-three percent were low in P, 33% tested medium for P while 39% of the submitted samples were classified as high in soil test P. This means that 44% tested high or very high in P. 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 on page 9).

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, 8% was classified as low in potassium. Seventeen percent tested medium, 32% high and 43% very high. For samples submitted for commercial production, 1% tested very low in K, 6% tested low, 18% tested medium, 29% tested high and 46% 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 less than 10 to almost 6000 lbs Mg/acre (Morgan extraction). There were only two samples that tested very low in Mg. Most soils tested high or very high for Mg (99% of the homeowner soils and 95% of the soils of the commercial growers). No more than 2 of the homeowner soils and 4% of the commercial growers' soil tested low or medium in Mg. Thus, magnesium deficiency is not likely to occur in Niagara 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 92-95% in the normal range with 8% of the home and garden samples and 5% of the samples for commercial production testing excessive for Fe. Similarly, most soils (89-98%) 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

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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, 93% tested high for zinc while 7% tested medium. Of the samples for commercial production, 4% tested low in zinc, 27% tested medium while 70% was 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	1	0	2	4	2
APR	0	0	0	0	0	1	0	1	0
ATF	0	1	0	0	1	0	1	3	1
FAR	0	5	0	0	8	0	0	13	6
FLA	0	1	1	0	8	1	0	11	5
GEN	0	0	0	0	4	0	0	4	2
LAW	6	16	22	12	40	7	3	106	49
MVG	3	2	4	1	3	3	5	21	10
OTH	0	0	0	0	1	0	0	1	0
PER	2	0	0	5	2	0	3	12	6
SAG	2	7	3	2	12	2	12	40	18
TRF	0	0	0	1	0	0	0	1	0
Unknown	0	0	0	0	1	0	0	1	0
Total	13	32	31	21	81	14	26	218	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	5	2	1	3	4	3	1	19	2
ACT	0	2	0	0	0	0	0	2	0
AGE/AGT	6	4	5	4	5	0	0	24	3
ALE/ALT	1	1	0	2	2	0	0	6	1
APP	4	50	59	48	37	45	14	257	28
BCE/BCT	0	8	1	0	0	0	0	9	1
BDR/BND	5	0	0	0	0	3	0	8	1
BGE/BGT	6	5	0	4	0	3	1	19	2
BSP	0	0	0	0	0	0	3	3	0
BSS	0	0	0	0	0	0	1	1	0
BTE/BTT	0	2	0	0	0	1	0	3	0
BUK	1	0	0	0	0	0	0	1	0
CBP	7	9	6	16	9	0	2	49	5
CBS	0	2	1	2	1	0	0	6	1
CGE/CGT	7	0	2	0	0	0	2	11	1
CHS	2	6	7	7	0	4	0	26	3
CHT	0	4	0	0	1	1	0	6	1
CKS	0	0	1	0	0	0	0	1	0
CLE/CLT	0	0	1	0	0	0	4	5	1
COG/COS	23	35	7	33	23	16	6	143	15
GIE/GIT	0	0	0	0	0	0	1	1	0
GPA	4	3	7	4	6	16	3	43	5
GPF	0	0	1	0	0	0	1	2	0
GPV	0	0	0	0	0	0	2	2	0
GRE/GRT	2	3	0	0	2	2	0	9	1
IDL	0	0	1	0	0	3	0	4	0
MIX	0	5	2	1	1	2	1	12	1
MML	1	1	0	0	0	1	1	4	0
NEC	0	0	1	0	0	0	0	1	0
OAS	0	1	0	0	0	0	1	2	0
OAT	0	0	0	0	3	1	0	4	0
ONP	0	0	0	1	0	0	0	1	0
ONS	0	0	0	0	0	1	0	1	0
OTH	0	2	0	0	2	0	0	4	0
PAR	0	3	1	3	0	3	0	10	1

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Current year crop	1995	1996	1997	1998	1999	2000	2001	Total	%
PCH	2	5	1	3	0	4	0	15	2
PEA	0	1	2	1	0	0	0	4	0
PGE/PGT	1	0	0	0	3	1	0	5	1
PIE/PIT	0	0	0	0	5	0	1	6	1
PLE/PLT	0	0	0	0	1	0	0	1	0
PLM	0	0	0	0	0	2	0	2	0
PNE/PNT	0	0	0	0	2	0	0	2	0
POT	0	0	0	1	0	0	0	1	0
PRN	0	2	2	2	0	2	0	8	1
PUM	2	1	2	2	2	0	0	9	1
RSF	0	0	0	0	1	0	0	1	0
SOG	1	0	2	0	0	0	1	4	0
SOY	10	13	0	28	8	10	3	72	8
STS	2	0	1	2	1	2	0	8	1
SUN	0	0	0	0	0	2	0	2	0
SWC	11	6	10	3	0	4	6	40	4
TME	2	1	0	0	0	1	1	5	1
TOM	1	0	0	2	0	0	0	3	0
TRE/TRT	0	1	0	1	0	0	0	2	0
WHT	10	1	6	2	0	2	6	27	3
Unknown	1	8	1	0	1	0	1	12	1
Total	117	187	131	175	120	135	63	928	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)	3	10	16	9	8	6	3	55
SMG 3 (silt loam)	1	8	9	1	24	3	3	49
SMG 4 (sandy loam)	6	10	4	10	42	4	19	95
SMG 5 (sandy)	3	4	2	1	7	1	1	19
SMG 6 (mucky)	0	0	0	0	0	0	0	0
Total	13	32	31	21	81	14	26	218

3.2 Samples for Commercial Production

Soil series for samples submitted for commercial production:

Name	SMG	1995	1996	1997	1998	1999	2000	2001	Total
Altmar	5	0	7	0	1	0	2	1	11
Appleton	2	9	10	4	24	9	10	7	73
Arkport	4	0	16	14	8	1	15	1	55
Bombay	4	0	0	0	0	0	4	0	4
Canandaigua	3	2	2	0	0	0	0	0	4
Cayuga	2	5	0	3	0	2	0	3	13
Cazenovia	2	1	0	0	1	0	0	0	2
Cheektowaga	5	0	0	0	0	0	0	1	1
Churchville	2	0	1	1	1	2	3	0	8
Claverack	4	2	5	4	2	2	1	0	16
Collamer	3	4	18	12	22	11	22	0	89
Colonie	5	0	1	3	2	0	0	0	6
Cosad	4	3	3	0	1	2	0	1	10
Dunkirk	3	0	7	4	7	1	0	1	20
Elnora	5	4	2	0	0	1	3	0	10
Fonda	2	0	0	1	0	0	0	0	1
Fredon	4	1	1	0	1	0	1	1	5
Galen	4	1	1	3	5	0	1	0	11
Hamlin	2	0	2	0	0	0	0	0	2
Hilton	2	10	20	9	18	27	14	6	104
Howard	3	4	7	16	7	4	9	6	53
Hudson	2	1	2	0	0	0	1	1	5
Lairdsville	2	0	0	0	0	0	2	0	2
Lakemont	5	1	1	1	0	1	2	0	6
Lamson	4	0	0	4	2	0	0	0	6
Lockport	2	1	0	0	0	0	0	0	1
Madalin	1	2	0	0	2	7	0	0	11
Massena	4	0	0	5	0	0	0	1	6
Minoa	4	1	3	4	8	1	0	0	17
Niagara	3	3	2	4	3	2	2	2	18
Odessa	2	21	15	3	6	12	12	5	74
Ontario	2	3	2	4	9	3	2	0	23
Otisville	4	11	9	5	5	2	3	4	39
Ovid	2	6	9	0	5	9	3	11	43
Phelps	3	7	10	11	8	7	10	6	59
Raynham	3	4	0	0	1	0	0	0	5

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Name	SMG	1995	1996	1997	1998	1999	2000	2001	Total
Rhinebeck	2	10	30	14	26	11	9	4	104
Stafford	4	0	0	0	0	0	0	1	1
Sun	4	0	1	1	0	3	3	0	8
unknown	-	0	0	1	0	0	1	0	2
Total	-	117	187	131	175	120	135	63	928

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	3	3	0	4	0	0	3	13
1996	0	2	7	7	12	2	1	1	32
1997	0	0	6	10	5	5	2	3	31
1998	0	0	3	11	5	2	0	0	21
1999	0	3	8	14	21	16	6	13	81
2000	0	0	3	2	2	4	1	2	14
2001	2	2	2	6	6	4	1	3	26
Total	2	10	32	50	55	33	11	25	218

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	1.1	1.7	2.2	2.5	1.3	2.0	0.2	
Highest:	16.2	24.8	9.9	5.9	59.9	15.6	10.7	
Mean:	5.0	4.4	4.4	3.8	7.7	5.5	4.2	
Median:	4.0	4.0	3.8	3.6	4.7	4.9	4.1	

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	23	23	0	31	0	0	23	100
1996	0	6	22	22	38	6	3	3	100
1997	0	0	19	32	16	16	6	10	100
1998	0	0	14	52	24	10	0	0	100
1999	0	4	10	17	26	20	7	16	100
2000	0	0	21	14	14	29	7	14	100
2001	8	8	8	23	23	15	4	12	100
Total	1	5	15	23	25	15	5	11	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	1	14	42	28	20	6	5	1	117
1996	7	40	69	52	10	5	3	1	187
1997	1	45	55	25	2	2	1	0	131
1998	1	35	78	46	14	0	0	1	175
1999	0	10	52	33	17	4	2	2	120
2000	4	37	54	16	17	4	2	1	135
2001	2	15	22	13	3	2	3	3	63
Total	16	196	372	213	83	23	16	9	928

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	0.7	0.1	0.8	0.7	1.1	0.7	0.5	
Highest:	7.2	7.4	6.3	7.1	9.0	7.3	8.4	
Mean:	3.3	2.7	2.4	2.7	3.2	2.7	3.0	
Median:	3.0	2.7	2.2	2.6	2.9	2.4	2.7	

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	1	12	36	24	17	5	4	1	100
1996	4	21	37	28	5	3	2	1	100
1997	1	34	42	19	2	2	1	0	100
1998	1	20	45	26	8	0	0	1	100
1999	0	8	43	28	14	3	2	2	100
2000	3	27	40	12	13	3	1	1	100
2001	3	24	35	21	5	3	5	5	100
Total	2	21	40	23	9	2	2	1	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	0	1	3	4	5	0	0	13
1996	1	0	1	2	4	6	10	8	0	0	32
1997	0	0	0	0	0	5	13	13	0	0	31
1998	0	0	0	0	3	5	6	7	0	0	21
1999	0	0	3	7	1	4	20	32	13	1	81
2000	0	1	0	1	2	2	3	4	1	0	14
2001	0	0	1	0	2	2	6	9	6	0	26
Total	1	1	5	10	13	27	62	78	20	1	218

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	6.3	4.4	6.5	6.1	5.2	4.8	5.0	
Highest:	7.8	7.8	7.9	7.7	8.5	8.0	8.3	
Mean:	-	-	-	-	-	-	-	
Median:	7.3	7.1	7.4	7.2	7.5	7.0	7.5	

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	0	8	23	31	38	0	0	100
1996	3	0	3	6	13	19	31	25	0	0	100
1997	0	0	0	0	0	16	42	42	0	0	100
1998	0	0	0	0	14	24	29	33	0	0	100
1999	0	0	4	9	1	5	25	40	16	1	100
2000	0	7	0	7	14	14	21	29	7	0	100
2001	0	0	4	0	8	8	23	35	23	0	100
Total	0	0	2	5	6	12	28	36	9	0	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	2	8	23	38	33	12	0	0	0	117
1996	1	4	19	41	65	42	11	4	0	0	187
1997*	4	5	11	32	42	24	9	1	0	0	128
1998	0	2	4	25	51	59	28	6	0	0	175
1999	0	0	10	25	27	38	18	2	0	0	120
2000	3	4	11	22	33	34	22	6	0	0	135
2001	0	1	0	11	32	10	6	3	0	0	63
Total	9	18	63	179	288	240	106	22	0	0	925

*Three samples were not analyzed for pH in 1997.

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	4.3	4.4	3.4	4.8	5.0	4.0	4.7	
Highest:	7.3	7.7	7.5	7.9	7.5	7.8	7.9	
Mean:	-	-	-	-	-	-	-	
Median:	6.3	6.1	6.1	6.5	6.4	6.4	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	2	7	20	32	28	10	0	0	0	100
1996	1	2	10	22	35	22	6	2	0	0	100
1997	3	4	9	25	33	19	7	1	0	0	100
1998	0	1	2	14	29	34	16	3	0	0	100
1999	0	0	8	21	23	32	15	2	0	0	100
2000	2	3	8	16	24	25	16	4	0	0	100
2001	0	2	0	17	51	16	10	5	0	0	100
Total	1	2	7	19	31	26	11	2	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	4	1	5	0	0	0	0	0	3	13
1996	0	9	6	12	0	1	1	2	0	1	32
1997	0	2	13	9	4	2	0	1	0	0	31
1998	0	3	3	8	3	0	1	1	1	1	21
1999	0	10	17	31	4	6	2	3	0	8	81
2000	0	0	2	6	1	1	1	2	0	1	14
2001	0	2	8	3	6	3	0	1	0	3	26
Total	0	30	50	74	18	13	5	10	1	17	218

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	4	2	
Highest:	864	273	120	216	1773	795	518	
Mean:	121	29	23	43	161	104	70	
Median:	16	10	10	19	16	37	40	

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	31	8	38	0	0	0	0	0	23	100
1996	0	28	19	38	0	3	3	6	0	3	100
1997	0	6	42	29	13	6	0	3	0	0	100
1998	0	14	14	38	14	0	5	5	5	5	100
1999	0	12	21	38	5	7	2	4	0	10	100
2000	0	0	14	43	7	7	7	14	0	7	100
2001	0	8	31	12	23	12	0	4	0	12	100
Total	0	14	23	34	8	6	2	5	0	8	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	36	33	42	3	2	0	0	0	1	117
1996	0	61	58	57	8	2	0	1	0	0	187
1997	0	20	41	63	6	0	0	1	0	0	131
1998	0	28	63	78	1	1	0	4	0	0	175
1999	0	28	42	40	6	2	2	0	0	0	120
2000	0	31	50	51	2	0	0	0	1	0	135
2001	0	14	15	29	3	1	0	1	0	0	63
Total	0	218	302	360	29	8	2	7	1	1	928

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:	243	167	145	145	94	153	115	
Mean:	13	12	15	14	14	10	15	
Median:	6	5	9	8	7	7	9	

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
1995	0	31	28	36	3	2	0	0	0	1	100
1996	0	33	31	30	4	1	0	1	0	0	100
1997	0	15	31	48	5	0	0	1	0	0	100
1998	0	16	36	45	1	1	0	2	0	0	100
1999	0	23	35	33	5	2	2	0	0	0	100
2000	0	23	37	38	1	0	0	0	1	0	100
2001	0	22	24	46	5	2	0	2	0	0	100
Total	0	23	33	39	3	1	0	1	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	2	3
1996	0	0	3	4	3	10
1997	0	3	3	5	5	16
1998	0	0	0	3	6	9
1999	0	0	0	1	7	8
2000	0	0	0	0	6	6
2001	0	0	0	0	3	3
Total (#)	0	3	6	14	32	55
Total (%)	0	5	11	25	58	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	1	0	0	1
1996	0	1	4	3	0	8
1997	0	1	2	1	5	9
1998	0	0	0	0	1	1
1999	0	0	0	6	18	24
2000	0	0	2	1	0	3
2001	0	1	0	0	2	3
Total (#)	0	3	9	11	26	49
Total (%)	0	6	18	22	53	100

Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
1995	0	1	0	2	3	6
1996	0	3	1	3	3	10
1997	0	2	1	1	0	4
1998	0	1	1	5	3	10
1999	0	0	9	19	14	42
2000	0	0	0	1	3	4
2001	2	2	3	6	6	19
Total (#)	2	9	15	37	32	95
Total (%)	2	9	16	39	34	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
1995	0	0	1	2	0	3
1996	0	2	1	0	1	4
1997	0	0	1	0	1	2
1998	0	0	0	1	0	1
1999	0	0	2	4	1	7
2000	0	0	1	0	0	1
2001	0	0	0	0	1	1
Total (#)	0	2	6	7	4	19
Total (%)	0	11	32	37	21	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	1	2	5	5	13
1996	0	6	9	10	7	32
1997	0	6	7	7	11	31
1998	0	1	1	9	10	21
1999	0	0	11	30	40	81
2000	0	0	3	2	9	14
2001	2	3	3	6	12	26
Total #	2	17	36	69	94	218

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	70	55	50	98	119	88	33	
Highest:	3126	913	416	562	5387	1467	1099	
Mean:	482	193	160	205	681	453	266	
Median:	193	140	133	178	218	381	214	

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

Summary (%)	Very Low	Low	Medium	High	Very High	Total
1995	0	8	15	38	38	100
1996	0	19	28	31	22	100
1997	0	19	23	23	35	100
1998	0	5	5	43	48	100
1999	0	0	14	37	49	100
2000	0	0	21	14	64	100
2001	8	12	12	23	46	100
Grand Total	1	8	17	32	43	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	0	1	1	2
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	1	1	2
1999	0	0	2	1	4	7
2000	0	0	0	0	0	0
2001	0	0	0	0	0	0
Total (#)	0	0	2	3	6	11
Total (%)	0	0	18	27	55	100
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
1995	1	3	14	26	23	67
1996	0	5	19	28	39	91
1997	0	1	5	9	24	39
1998	1	3	17	33	36	90
1999	1	9	14	19	32	75
2000	0	4	11	14	27	56
2001	1	1	6	13	15	36
Total (#)	4	26	86	142	196	454
Total (%)	1	6	19	31	43	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
1995	1	0	6	6	11	24
1996	0	6	12	13	15	46
1997	0	2	4	13	28	47
1998	0	2	4	11	31	48
1999	0	0	1	3	21	25
2000	0	5	6	19	13	43
2001	0	0	0	5	11	16
Total (#)	1	15	33	70	130	249
Total (%)	0	6	13	28	52	100

Ketterings, Q.M., H. Krol, W.S. Reid and N. Herendeen (2003). Niagara County Soil Sample Survey 1995-2001. CSS Extension Bulletin E03-29. 40 pages.

Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
1995	0	1	3	4	11	19
1996	1	2	13	8	15	39
1997	0	0	6	13	21	40
1998	0	4	5	10	13	32
1999	0	2	1	1	7	11
2000	0	2	3	5	18	28
2001	0	0	1	2	6	9
Total (#)	1	11	32	43	91	178
Total (%)	1	6	18	24	51	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
1995	0	2	2	1	0	5
1996	1	1	3	4	2	11
1997	0	0	1	2	1	4
1998	0	1	1	1	0	3
1999	0	0	1	1	0	2
2000	1	0	3	2	1	7
2001	0	0	0	2	0	2
Total (#)	2	4	11	13	4	34
Total (%)	6	12	32	38	12	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 samples submitted for commercial production within each potassium classification.

Summary (#)	Very Low	Low	Medium	High	Very High	Un-known	Total
1995	2	6	25	38	46	0	117
1996	2	14	47	53	71	0	187
1997	0	3	16	37	74	1	131
1998	1	10	27	56	81	0	175
1999	1	11	19	25	64	0	120
2000	1	11	23	40	59	1	135
2001	1	1	7	22	32	0	63
Grand Total	8	56	164	271	427	2	928

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	36	38	49	29	29	48	34	
Highest:	974	927	713	677	1370	1079	601	
Mean:	186	197	245	212	243	235	225	
Median:	145	153	226	170	216	186	186	

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

% summary	Very Low	Low	Medium	High	Very High	Un-known	Total
1995	2	5	21	32	39	0	100
1996	1	7	25	28	38	0	100
1997	0	2	12	28	56	1	100
1998	1	6	15	32	46	0	100
1999	1	9	16	21	53	0	100
2000	1	8	17	30	44	1	100
2001	2	2	11	35	51	0	100
Grand Total	1	6	18	29	46	0	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	2	11	13
1996	0	0	1	0	31	32
1997	0	0	0	0	31	31
1998	0	0	0	0	21	21
1999	0	0	0	1	80	81
2000	0	0	1	0	13	14
2001	0	0	0	0	26	26
Total	0	0	2	3	213	218

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	107	82	291	298	148	73	274	
Highest:	1589	2234	1693	1017	5724	1809	1469	
Mean:	700	620	708	577	1119	757	721	
Median:	597	569	650	582	767	658	616	

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	15	85	100
1996	0	0	3	0	97	100
1997	0	0	0	0	100	100
1998	0	0	0	0	100	100
1999	0	0	0	1	99	100
2000	0	0	7	0	93	100
2001	0	0	0	0	100	100
Total	0	0	1	1	98	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	1	1	2	21	92	117
1996	1	2	10	31	143	187
1997	0	2	8	35	86	131
1998	0	2	1	31	141	175
1999	0	0	0	10	110	120
2000	0	2	11	29	93	135
2001	0	1	0	13	49	63
Total	2	10	32	170	714	928

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	8	11	50	52	101	55	23	
Highest:	1944	2647	1344	1371	1527	1676	1453	
Mean:	461	461	303	395	521	423	427	
Median:	353	326	256	320	406	333	339	

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	1	1	2	18	79	100
1996	1	1	5	17	76	100
1997	0	2	6	27	66	100
1998	0	1	1	18	81	100
1999	0	0	0	8	92	100
2000	0	1	8	21	69	100
2001	0	2	0	21	78	100
Total	0	1	3	18	77	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	12	1	13
1996	28	4	32
1997	31	0	31
1998	21	0	21
1999	73	8	81
2000	12	2	14
2001	24	2	26
Total	201	17	218

Percentages:

	0-49	>49	Total
	Normal	Excessive	
	92	8	100
	88	13	100
	100	0	100
	100	0	100
	90	10	100
	86	14	100
	92	8	100
	92	8	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	2	2	2	2	1	3	2	
Highest:	59	209	17	33	155	151	86	
Mean:	14	33	8	8	16	25	15	
Median:	6	20	8	5	5	13	8	

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	98	19	117
1996	179	8	187
1997	127	4	131
1998	170	5	175
1999	117	3	120
2000	128	7	135
2001	58	5	63
Total	877	51	928

Percentages:

	0-49	>49	Total
	Normal	Excessive	
	84	16	100
	96	4	100
	97	3	100
	97	3	100
	98	3	100
	95	5	100
	92	8	100
	95	5	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	1	2	1	1	1	1	1	
Highest:	432	253	133	95	112	220	132	
Mean:	27	17	14	11	12	16	17	
Median:	12	10	8	7	8	7	8	

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:				Percentages:		
	0-99	>99	Total	0-99	>99	Total
	Normal	Excessive		Normal	Excessive	
1995	12	1	13	92	8	100
1996	31	1	32	97	3	100
1997	28	3	31	90	10	100
1998	21	0	21	100	0	100
1999	69	12	81	85	15	100
2000	13	1	14	93	7	100
2001	21	5	26	81	19	100
Total	195	23	218	89	11	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	14	13	8	19	14	13	21	
Highest:	217	162	222	61	205	138	202	
Mean:	53	45	52	35	52	57	69	
Median:	39	32	45	32	38	57	53	

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	116	1	117
1996	186	1	187
1997	125	6	131
1998	171	4	175
1999	118	2	120
2000	131	4	135
2001	62	1	63
Total	909	19	928

Percentages:

	0-99	>99	Total
	Normal	Excessive	
	99	1	100
	99	1	100
	95	5	100
	98	2	100
	98	2	100
	97	3	100
	98	2	100
	98	2	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	5	4	7	8	8	6	13	
Highest:	103	367	179	123	151	170	147	
Mean:	33	30	36	31	34	30	39	
Median:	28	26	27	25	31	24	33	

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	11	13
1996	0	2	30	32
1997	0	2	29	31
1998	0	0	21	21
1999	1	7	73	81
2000	0	0	14	14
2001	0	2	24	26
Total	1	15	202	218

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
0	15	85	100
0	6	94	100
0	6	94	100
0	0	100	100
1	9	90	100
0	0	100	100
0	8	92	100
0	7	93	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	0.6	1.0	0.9	1.4	0.3	1.5	0.9	
Highest:	16.9	15.0	22.0	18.2	36.3	41.0	99.5	
Mean:	4.7	3.9	4.6	6.6	6.5	7.9	14.1	
Median:	1.7	2.3	2.2	4.1	3.0	2.9	7.6	

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	5	25	87	117
1996	6	46	135	187
1997	1	28	102	131
1998	8	76	91	175
1999	4	31	85	120
2000	9	27	99	135
2001	0	14	49	63
Total	33	247	648	928

Percentages:

<0.5	0.5-1.0	>1	Total
Low	Medium	High	
4	21	74	100
3	25	72	100
1	21	78	100
5	43	52	100
3	26	71	100
7	20	73	100
0	22	78	100
4	27	70	100

	1995	1996	1997	1998	1999	2000	2001	
Lowest:	0.4	0.1	0.4	0.3	0.2	0.1	0.5	
Highest:	10.4	14.4	19.6	41.4	13.1	87.8	21.1	
Mean:	1.9	2.3	2.6	2.0	1.9	6.0	2.8	
Median:	1.6	1.7	1.8	1.1	1.4	2.0	2.1	

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
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
ACT	Apricots
ALG	Ornamentals, Adapted to pH 4.5-6
APP	Apples

Crop Code	Crop Description
APR	Asparagus (homeowners)
ATF	Athletic Field
ASP	Asparagus (commercial)
BDR/BND	Beans-dry
BLU/BLB	Blueberries
CBP	Cabbage, Transplanted
CBS	Cabbage, Seeded
CEM	Cemetery
CHS	Cherries, Sweet
CHT	Cherries, Tart
CKS	Cucumber, Seeded
END	Endives
FAR	Fairway
FLA	Flowering Annuals
GEN	Green
GPA	Grapes, American
GPF	Grapes, French-American
GPV	Grapes, Vinifera
HRB	Herbs
IDL	Idle land
LAW	Lawn
LET	Lettuce
MIX/MVG	Mixed vegetables
MML	Muskmelon
NEC	Nectarines
ONP	Onion, Transplanted
ONS	Onion, Seeded
OTH	Other
PAR	Pears
PEA	Peas
PCH	Peaches
PER	Perennials
PLM	Plums
POP	Popcorn
POT/PTO	Potatoes
PRK	Park
PRN	Prunes
PUM	Pumpkins
ROD	Roadside

Crop Code	Crop Description
ROS	Roses
ROU	Rough
RSF	Raspberries, Fall
RSP	Raspberries (homeowners)
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
TME	Tomatoes, Early
TOM	Tomatoes
TRE	Christmas trees, Established
TRF	Tree fruits
TRT	Christmas trees, Topdressing