

# Soil Sample Survey

# Wayne Co.

**Samples analyzed by CNAL in 1995-2001**

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In western Wayne County, urban pressure from Rochester competes for farmland. The drumlins make home sites with panoramic views. The glacial till plains between the hills are used for agriculture, but often competing uses such as this golf course replace farm crops. Soil testing is as important for turf management as it is for farming.

**Summary compiled by**

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

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

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## Introduction

Wayne County is located adjacent to Lake Ontario east of Monroe (city of Rochester). It contains 388,480 acres of land area. Approximately 170,000 acres or 43% of the area is used for farm production in any given year. The agriculture in Wayne County is extremely diverse.

The county lies entirely in the Ontario Lake Plains physiographic region. The northern lake plain begins at Lake Ontario, where the elevation is 246 feet above sea level. It increases gradually in elevation to the south, about 600 feet at the Ontario and Seneca County border.

The classic drumlin and drumlin fields are the most conspicuous topography in Wayne County. The drumlins range from 60 feet to 250 feet above the surrounding glacial till plain. The average height above the landscape is 160 feet and the average length is 3500 feet. The drumlins are oriented north-south. The highest is Brantling hill with an elevation of 681 feet.

In the northern third of the county, the streams flow northward directly to Lake Ontario. The rest of the county drains eastward through Ganargua Creek, the Barge Canal and the Clyde River.

The soils in the north are dominated by glacial till that was greatly modified by glacial outwash and/or glacial lake sediments. These soils were mostly derived from the Sodus shale, Medina sandstone and Queenston shale. The soils in the south are derived from high carbonate materials deposited by glacial advance across the dolomitic limestone escarpment. However, glacial outwash materials and/or lacustrine sediments also modified much of this area. Huge deposits of sand and gravel are found in the old channels where the Great Lakes drainage flowed eastward across the face of the receding glacial ice sheets and intersected with the north flowing rivers that became the Finger Lakes outlets.

Lake Iroquois was a glacial lake that covered the northern third of the county during the glacial recession. The beach ridge from that lake became a prominent feature and was the

base for Indian trails that eventually became the Ridge Road (Rt. 104). Large deltaic deposits formed along this lake and became the fine sand and silt soils.

The glacial recession also left many areas of shallow lakes. These became the extensive wetlands in the county. Many were drained to make organic soils, the largest being the Montezuma mucklands on the eastern border with Cayuga County.

The agriculture of Wayne County is diverse. Tree fruit production is the dominant industry in the northern third of the county. Apples, cherries, peaches, pears and plums are the most important generator of farm income. Small fruits such as strawberries, brambles and blueberries are grown for fresh market sales. Next is dairy and associated feed grain production. Third is vegetable production for fresh market and processing (peas, snap beans, sweet corn, kidney beans, cabbage, pumpkins, potatoes). Next are greenhouse, nursery and ornamental production. Large and small-scale livestock producers market poultry (eggs), beef, sheep and hogs. There is also a significant pleasure horse industry in the area. Hay and grain crops not used locally are exported to areas throughout the eastern United States.

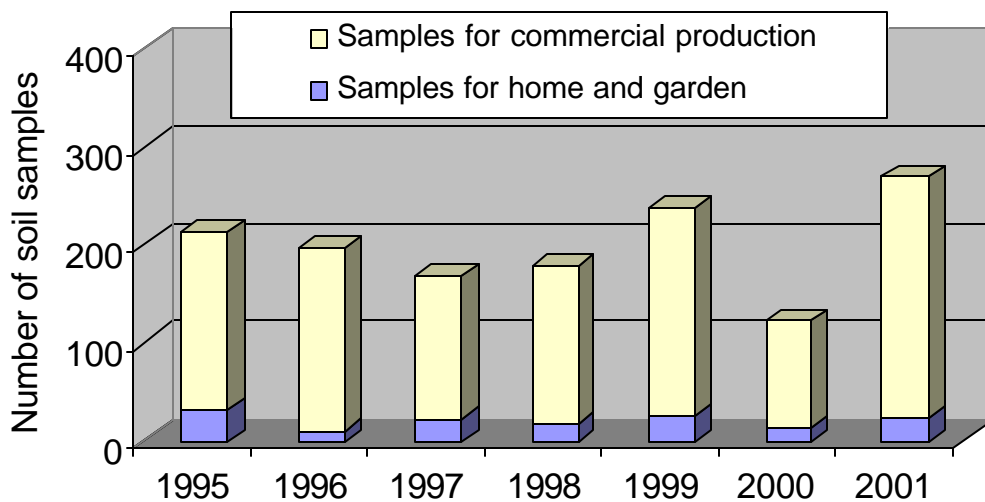
Wayne County is home to several of the largest tree fruit production farms in New York. Stored apples are marketed throughout the eastern United States all year-round.

All the above industries rely heavily on soil testing to maintain optimum production while protecting the agricultural environment from nutrient runoff.

By Nathan Herendeen and Beth Claypoole, Cornell Cooperative Extension

## 1. General Survey Summary

This survey summarizes the soil test results from Wayne 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 1380. Of these 1380 samples, 1239 (90%) were submitted to obtain fertilizer recommendations for commercial production while 141 samples (10%) were submitted as home and garden samples.



| <b>Homeowners</b> |            | <b>Commercial</b> |             | <b>Total</b> |
|-------------------|------------|-------------------|-------------|--------------|
| 1995              | 31         | 1995              | 182         | 213          |
| 1996              | 10         | 1996              | 186         | 196          |
| 1997              | 22         | 1997              | 146         | 186          |
| 1998              | 16         | 1998              | 161         | 177          |
| 1999              | 25         | 1999              | 212         | 237          |
| 2000              | 14         | 2000              | 107         | 121          |
| <u>2001</u>       | <u>23</u>  | <u>2001</u>       | <u>245</u>  | <u>268</u>   |
| <b>Total</b>      | <b>141</b> | <b>Total</b>      | <b>1239</b> | <b>1380</b>  |

Many of the home and garden (33%) were submitted to request fertilizer recommendations for lawns while 28% of the samples were submitted to obtain home garden vegetable recommendation. Others requested recommendations for athletic fields, ornamentals, other perennials, fruit trees, roses, etc. People submitting samples for commercial production requested fertilizer recommendations for apples (31%), corn silage or grain production (19%), alfalfa or alfalfa/grass mixtures (6%), potatoes (4%), and sweet corn (4%), while fewer samples were submitted for other crops including small grains and vegetables.

Home and garden samples in Monroe County were silty (22%), silt loams (25%), sandy loams (33%) or sandy (20%) belonging to soil management group 2, 3, 4, and 5, respectively. 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, 37% belonged to soil management group 2. Sixteen percent were classified as group 3 soils, 30% as group 4 soils and 7% as

group 5 soils. Six percent belonged to soil management group 6 while the remainder of the soils could not be classified with regards to soil management group. The five most common soil series were Ontario (18%), Hilton (11%), Ira (8%), Williamson (8%), and Palmyra (7%). These soils represent 17% (Ontario), 9% (Hilton), 3% Ira, 8% (Williamson), and 7% (Palmyra) of the 392,210 acres of land area in the county.

Organic matter levels, as measured by loss on ignition, ranged from less than 1% to slightly more than 60% for the organic soils in soil management group 6 with median values ranging from 2.1 to 4.8% organic matter for home and garden samples and 2.7 to 3.0% for samples submitted for commercial production. Seventy-three percent of the home and garden samples had between 2 and 5% organic matter with 33% testing between 2 and 2.9% organic matter, 22% between 3.0 and 3.9% organic matter, and 18% between 4.0 and 4.9% organic matter. A little over 15% of the soils submitted for home and garden tested >4.9% in organic matter while 12% had less than 2% organic matter. Of the samples submitted for commercial production, 12% contained between 1-2% organic matter, while 39% had between 2 and 3% organic matter and 25% contained between 3 and 4% organic matter. In total, 77% of the samples had less than 4% organic matter.

Soil pH in water (1:1 extraction ratio) varied from pH 4.3 to 8.2 with the median for home and garden samples ranging from pH 6.5 to pH 7.3 and for samples submitted for commercial production ranging from pH 6.3 to pH 6.6. Of the home and garden samples, 90% had a pH of 6.0 or higher. For the samples submitted for commercial production, this was 76% while 22% 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, 9% tested low, 25% tested medium, 35% tested high and 31% tested very high. This meant that 66% tested high or very high in P. Fourteen percent of the samples



submitted for commercial production tested very high in P. Twenty-five percent were low in P, another 25% tested medium for P while 36% of the submitted samples were classified as high in soil test P. This means that 50% 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 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, 19% were classified as very low or low in potassium. Thirteen percent tested medium, 26% high and 41% very high. For samples submitted for commercial production, 2% tested very low in K, 10% tested low, 17% tested medium, 28% tested high and 39% tested very high in potassium with the remainder being of unknown K classification. 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 16 to over 7,000 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 (98% of the homeowner soils and 95% of the soils of the commercial growers). No more than 2% of the homeowner soils and 5% of the commercial growers' soil tested low or medium in Mg. Thus, magnesium deficiency is not likely to occur in Wayne 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 97% in the normal range with 4 of the home and garden samples and 3% of the samples for commercial production testing excessive for Fe. Similarly, most soils (96%) 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, 81% tested high for zinc while 16% tested medium and 3% were low in zinc. Of the samples for commercial production, 4% tested low in zinc, 24% tested medium while 72% 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    | 0    | 1    | 0    | 1    | 0    | 2     | 1   |
| APR     | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 1     | 1   |
| ATF     | 0    | 2    | 3    | 1    | 5    | 0    | 0    | 11    | 8   |
| BLU     | 0    | 0    | 0    | 1    | 0    | 0    | 0    | 1     | 1   |
| FAR     | 3    | 0    | 0    | 0    | 0    | 0    | 0    | 3     | 2   |
| FLA     | 0    | 0    | 1    | 1    | 1    | 0    | 4    | 7     | 5   |
| GEN     | 1    | 0    | 1    | 0    | 0    | 0    | 0    | 2     | 1   |
| LAW     | 11   | 1    | 5    | 7    | 13   | 6    | 3    | 46    | 33  |
| MVG     | 9    | 6    | 7    | 3    | 2    | 5    | 7    | 39    | 28  |
| OTH     | 0    | 0    | 0    | 0    | 1    | 0    | 1    | 2     | 1   |
| PER     | 1    | 0    | 1    | 0    | 0    | 0    | 0    | 2     | 1   |
| PTO     | 0    | 0    | 0    | 0    | 1    | 0    | 0    | 1     | 1   |
| ROS     | 0    | 0    | 1    | 1    | 0    | 1    | 2    | 5     | 4   |
| RSP     | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 1     | 1   |
| SAG     | 4    | 1    | 2    | 0    | 1    | 0    | 0    | 8     | 6   |
| TRF     | 2    | 0    | 1    | 1    | 0    | 0    | 2    | 6     | 4   |
| Unknown | 0    | 0    | 0    | 0    | 1    | 1    | 2    | 4     | 3   |
| Total   | 31   | 10   | 22   | 16   | 25   | 14   | 23   | 141   | 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           | 2    | 0    | 0    | 0    | 0    | 0    | 0    | 2     | 0  |
| AGE/AGT           | 5    | 3    | 7    | 3    | 15   | 2    | 6    | 41    | 3  |
| ALE/ALT           | 4    | 7    | 5    | 4    | 3    | 0    | 15   | 38    | 3  |
| APP               | 55   | 76   | 62   | 52   | 77   | 17   | 39   | 378   | 31 |
| ASP               | 0    | 0    | 0    | 0    | 0    | 1    | 0    | 1     | 0  |
| BCE/BCT           | 0    | 0    | 0    | 5    | 0    | 0    | 0    | 5     | 0  |
| BDR/BND           | 0    | 22   | 1    | 2    | 3    | 0    | 0    | 28    | 2  |
| BGE/BGT           | 2    | 0    | 0    | 5    | 14   | 0    | 0    | 21    | 2  |
| BLB               | 0    | 0    | 0    | 0    | 1    | 0    | 0    | 1     | 0  |
| BNS               | 1    | 1    | 0    | 0    | 0    | 0    | 0    | 2     | 0  |
| BRP               | 0    | 0    | 0    | 1    | 0    | 0    | 0    | 1     | 0  |
| BTE               | 0    | 0    | 0    | 0    | 1    | 0    | 2    | 3     | 0  |
| BUK               | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 4     | 0  |
| CBP               | 2    | 0    | 3    | 8    | 3    | 0    | 0    | 16    | 1  |
| CBS               | 1    | 0    | 0    | 0    | 0    | 0    | 0    | 1     | 0  |
| CFP               | 0    | 0    | 0    | 0    | 1    | 0    | 0    | 1     | 0  |
| CGE/CGT           | 0    | 0    | 0    | 2    | 0    | 0    | 0    | 2     | 0  |
| CHS               | 0    | 2    | 0    | 2    | 0    | 0    | 1    | 6     | 0  |
| CHT               | 3    | 2    | 5    | 1    | 4    | 5    | 5    | 25    | 2  |
| CLE/CLT           | 0    | 0    | 0    | 0    | 1    | 1    | 2    | 4     | 0  |
| COG/COS           | 25   | 25   | 22   | 16   | 27   | 29   | 87   | 231   | 19 |
| EGG               | 0    | 0    | 1    | 0    | 0    | 0    | 1    | 2     | 0  |
| GPA               | 2    | 0    | 0    | 0    | 0    | 0    | 0    | 2     | 0  |
| GRE/GRT           | 3    | 3    | 0    | 5    | 13   | 6    | 2    | 32    | 3  |
| HRB               | 0    | 0    | 1    | 0    | 0    | 0    | 0    | 1     | 0  |
| IDL               | 5    | 0    | 1    | 1    | 9    | 0    | 1    | 17    | 1  |
| MIX               | 1    | 0    | 0    | 0    | 4    | 10   | 8    | 23    | 2  |
| NUR               | 0    | 0    | 0    | 2    | 0    | 0    | 0    | 2     | 0  |
| OAT               | 2    | 0    | 2    | 0    | 6    | 1    | 3    | 14    | 1  |
| ONS               | 2    | 4    | 2    | 15   | 0    | 0    | 7    | 30    | 2  |
| OTH               | 1    | 0    | 0    | 6    | 6    | 2    | 1    | 16    | 1  |
| PAR               | 2    | 2    | 1    | 0    | 2    | 2    | 1    | 10    | 1  |
| PCH               | 2    | 4    | 2    | 3    | 6    | 1    | 7    | 25    | 2  |
| PEA               | 8    | 0    | 0    | 0    | 0    | 0    | 0    | 8     | 1  |
| PEP               | 0    | 2    | 1    | 0    | 1    | 0    | 1    | 5     | 0  |

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| Current year crop | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total | %   |
|-------------------|------|------|------|------|------|------|------|-------|-----|
| PIE/PIT           | 0    | 0    | 5    | 0    | 0    | 0    | 1    | 6     | 0   |
| PLE/PLT           | 1    | 0    | 0    | 0    | 0    | 0    | 3    | 4     | 0   |
| PNE/PNT           | 1    | 0    | 1    | 1    | 3    | 1    | 0    | 7     | 1   |
| POT               | 7    | 7    | 4    | 14   | 3    | 0    | 13   | 48    | 4   |
| RSF               | 0    | 0    | 0    | 0    | 0    | 1    | 0    | 1     | 0   |
| RSS               | 0    | 1    | 0    | 2    | 0    | 1    | 0    | 4     | 0   |
| RYC               | 2    | 0    | 1    | 0    | 0    | 0    | 0    | 3     | 0   |
| RYS               | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 1     | 0   |
| SOY               | 2    | 0    | 4    | 0    | 0    | 14   | 5    | 25    | 2   |
| SQW               | 1    | 0    | 0    | 0    | 0    | 1    | 0    | 2     | 0   |
| STS               | 2    | 3    | 1    | 1    | 0    | 2    | 2    | 11    | 1   |
| SUD               | 0    | 0    | 0    | 0    | 0    | 0    | 2    | 2     | 0   |
| SWC               | 2    | 14   | 6    | 6    | 2    | 1    | 15   | 46    | 4   |
| TME               | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 1     | 0   |
| TOM               | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 1     | 0   |
| TRE/TRT           | 24   | 3    | 4    | 2    | 6    | 2    | 0    | 41    | 3   |
| WHS               | 1    | 0    | 1    | 0    | 0    | 0    | 0    | 2     | 0   |
| WHT               | 8    | 5    | 0    | 1    | 0    | 1    | 5    | 20    | 2   |
| Unknown           | 2    | 0    | 3    | 0    | 0    | 4    | 7    | 16    | 1   |
|                   |      |      |      |      |      |      |      |       |     |
| Total             | 182  | 186  | 146  | 161  | 212  | 107  | 245  | 1239  | 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)      | 7    | 3    | 6    | 5    | 3    | 2    | 5    | 31    |
| SMG 3 (silt loam)  | 8    | 0    | 4    | 6    | 7    | 3    | 7    | 35    |
| SMG 4 (sandy loam) | 8    | 3    | 8    | 5    | 11   | 6    | 6    | 47    |
| SMG 5 (sandy)      | 8    | 4    | 4    | 0    | 4    | 3    | 5    | 28    |
| SMG 6 (mucky)      | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0     |
| Total              | 31   | 10   | 22   | 16   | 25   | 14   | 23   | 141   |

### 3.2 Samples for Commercial Production

Soil series for samples submitted for commercial production:

| Name        | SMG | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|-------------|-----|------|------|------|------|------|------|------|-------|
| Alton       | 5   | 4    | 4    | 5    | 3    | 6    | 8    | 3    | 33    |
| Appleton    | 2   | 4    | 7    | 0    | 0    | 3    | 2    | 3    | 19    |
| Bombay      | 4   | 11   | 1    | 9    | 8    | 4    | 1    | 5    | 39    |
| Canandaigua | 3   | 6    | 1    | 1    | 2    | 2    | 3    | 2    | 17    |
| Carlisle    | 6   | 10   | 10   | 4    | 10   | 4    | 0    | 18   | 56    |
| Cazenovia   | 2   | 1    | 5    | 0    | 0    | 4    | 0    | 5    | 15    |
| Collamer    | 3   | 2    | 2    | 0    | 2    | 1    | 2    | 0    | 9     |
| Colonie     | 5   | 3    | 6    | 3    | 0    | 2    | 0    | 1    | 15    |
| Dunkirk     | 3   | 0    | 0    | 0    | 1    | 2    | 0    | 0    | 3     |
| Edwards     | 6   | 0    | 0    | 0    | 1    | 0    | 0    | 0    | 1     |
| Elnora      | 5   | 3    | 7    | 3    | 5    | 3    | 3    | 0    | 24    |
| Fredon      | 4   | 0    | 0    | 0    | 0    | 1    | 0    | 0    | 1     |
| Hilton      | 2   | 11   | 19   | 12   | 11   | 36   | 17   | 33   | 139   |
| Ira         | 4   | 9    | 28   | 15   | 8    | 30   | 7    | 4    | 101   |
| Lairdsville | 2   | 0    | 1    | 0    | 0    | 0    | 0    | 3    | 4     |
| Lamson      | 4   | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 1     |
| Lockport    | 2   | 16   | 3    | 7    | 0    | 2    | 2    | 5    | 35    |
| Madalin     | 1   | 0    | 0    | 1    | 0    | 2    | 0    | 0    | 3     |
| Madrid      | 4   | 13   | 12   | 10   | 4    | 1    | 1    | 9    | 50    |
| Martisco    | 6   | 1    | 0    | 0    | 0    | 1    | 0    | 0    | 2     |
| Massena     | 4   | 1    | 2    | 4    | 0    | 0    | 0    | 1    | 8     |
| Minoa       | 4   | 2    | 2    | 0    | 6    | 3    | 5    | 1    | 19    |
| Muck        | 6   | 0    | 1    | 0    | 18   | 0    | 0    | 0    | 19    |
| Newstead    | 4   | 0    | 0    | 0    | 0    | 2    | 1    | 0    | 3     |
| Niagara     | 3   | 2    | 2    | 0    | 2    | 0    | 0    | 0    | 6     |
| Oakville    | 5   | 0    | 1    | 0    | 2    | 2    | 4    | 2    | 11    |
| Ontario     | 2   | 40   | 17   | 14   | 24   | 26   | 21   | 77   | 219   |
| Ovid        | 2   | 0    | 2    | 0    | 0    | 1    | 0    | 0    | 3     |
| Palmyra     | 3   | 18   | 6    | 11   | 23   | 9    | 4    | 21   | 92    |
| Phelps      | 3   | 4    | 9    | 7    | 5    | 5    | 5    | 10   | 45    |
| Rhinebeck   | 2   | 0    | 4    | 1    | 9    | 6    | 0    | 0    | 20    |
| Sodus       | 4   | 10   | 9    | 11   | 3    | 13   | 3    | 2    | 51    |
| Teel        | 2   | 1    | 0    | 0    | 0    | 0    | 0    | 1    | 2     |
| Wallington  | 3   | 1    | 4    | 6    | 2    | 3    | 3    | 3    | 22    |
| Wayland     | 2   | 1    | 0    | 0    | 0    | 0    | 2    | 1    | 4     |
| Williamson  | 4   | 7    | 14   | 18   | 7    | 17   | 11   | 21   | 95    |

Ketterings, Q.M., H. Krol, W.S. Reid and N. Herendeen (2004). Wayne County Soil Sample Survey 1995-2001. CSS Extension Bulletin E04-13. 40 pages.

| Name    | SMG | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---------|-----|------|------|------|------|------|------|------|-------|
| Unknown | -   | 1    | 7    | 4    | 5    | 21   | 2    | 13   | 53    |
|         |     |      |      |      |      |      |      |      |       |
| Total   | -   | 182  | 186  | 146  | 161  | 212  | 107  | 245  | 1239  |



## 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   | 2       | 7       | 12      | 5       | 2       | 1       | 2    | 31    |
| 1996  | 0   | 1       | 0       | 2       | 4       | 3       | 0       | 0    | 10    |
| 1997  | 2   | 1       | 8       | 5       | 4       | 0       | 0       | 2    | 22    |
| 1998  | 0   | 0       | 8       | 2       | 3       | 1       | 0       | 2    | 16    |
| 1999  | 0   | 4       | 12      | 3       | 5       | 0       | 0       | 1    | 25    |
| 2000  | 0   | 7       | 4       | 2       | 1       | 0       | 0       | 0    | 14    |
| 2001  | 0   | 0       | 7       | 5       | 3       | 1       | 0       | 7    | 23    |
| Total | 2   | 15      | 46      | 31      | 25      | 7       | 1       | 14   | 141   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 1.5  | 1.5  | 0.9  | 2.0  | 1.7  | 1.0  | 2.0  |  |
| Highest: | 11.1 | 5.6  | 8.9  | 8.7  | 8.1  | 4.5  | 10.5 |  |
| Mean:    | 3.9  | 4.4  | 3.4  | 3.9  | 3.0  | 2.3  | 4.8  |  |
| Median:  | 3.5  | 4.8  | 3.0  | 3.1  | 2.3  | 2.1  | 3.7  |  |

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   | 6       | 23      | 39      | 16      | 6       | 3       | 6    | 100   |
| 1996  | 0   | 10      | 0       | 20      | 40      | 30      | 0       | 0    | 100   |
| 1997  | 9   | 5       | 36      | 23      | 18      | 0       | 0       | 9    | 100   |
| 1998  | 0   | 0       | 50      | 13      | 19      | 6       | 0       | 13   | 100   |
| 1999  | 0   | 16      | 48      | 12      | 20      | 0       | 0       | 4    | 100   |
| 2000  | 0   | 50      | 29      | 14      | 7       | 0       | 0       | 0    | 100   |
| 2001  | 0   | 0       | 30      | 22      | 13      | 4       | 0       | 30   | 100   |
| Total | 1   | 11      | 33      | 22      | 18      | 5       | 1       | 10   | 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  | 2   | 20      | 67      | 58      | 20      | 4       | 0       | 11   | 182   |
| 1996  | 1   | 18      | 74      | 53      | 19      | 9       | 1       | 11   | 186   |
| 1997  | 1   | 27      | 53      | 33      | 19      | 6       | 1       | 6    | 146   |
| 1998  | 1   | 14      | 62      | 37      | 11      | 5       | 0       | 31   | 161   |
| 1999  | 4   | 25      | 72      | 52      | 30      | 13      | 8       | 8    | 212   |
| 2000  | 1   | 14      | 43      | 32      | 11      | 3       | 2       | 1    | 107   |
| 2001  | 2   | 36      | 110     | 47      | 20      | 2       | 3       | 25   | 245   |
| Total | 12  | 154     | 481     | 312     | 130     | 42      | 15      | 93   | 1293  |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 0.7  | 0.9  | 0.7  | 0.8  | 0.4  | 0.9  | 0.8  |  |
| Highest: | 57.3 | 57.9 | 58.7 | 63.8 | 56.0 | 7.7  | 59.6 |  |
| Mean:    | 5.8  | 5.6  | 4.1  | 10.8 | 4.2  | 3.0  | 7.3  |  |
| Median:  | 3.0  | 3.0  | 2.8  | 3.0  | 3.0  | 2.9  | 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   | 11      | 37      | 32      | 11      | 2       | 0       | 6    | 100   |
| 1996  | 1   | 10      | 40      | 28      | 10      | 5       | 1       | 6    | 100   |
| 1997  | 1   | 18      | 36      | 23      | 13      | 4       | 1       | 4    | 100   |
| 1998  | 1   | 9       | 39      | 23      | 7       | 3       | 0       | 19   | 100   |
| 1999  | 2   | 12      | 34      | 25      | 14      | 6       | 4       | 4    | 100   |
| 2000  | 1   | 13      | 40      | 30      | 10      | 3       | 2       | 1    | 100   |
| 2001  | 1   | 15      | 45      | 19      | 8       | 1       | 1       | 10   | 100   |
| Total | 1   | 12      | 39      | 25      | 10      | 3       | 1       | 8    | 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       | 3       | 0       | 3       | 7       | 5       | 12      | 1       | 0    | 31    |
| 1996  | 0    | 0       | 0       | 1       | 1       | 2       | 4       | 2       | 0       | 0    | 10    |
| 1997  | 0    | 0       | 2       | 2       | 1       | 5       | 9       | 1       | 2       | 0    | 22    |
| 1998  | 0    | 0       | 1       | 2       | 4       | 5       | 2       | 2       | 0       | 0    | 16    |
| 1999  | 0    | 0       | 0       | 0       | 4       | 4       | 8       | 8       | 1       | 0    | 25    |
| 2000  | 0    | 0       | 0       | 0       | 4       | 3       | 2       | 2       | 3       | 0    | 14    |
| 2001  | 0    | 0       | 1       | 2       | 5       | 6       | 8       | 1       | 0       | 0    | 23    |
| Total | 0    | 0       | 7       | 7       | 22      | 32      | 38      | 28      | 7       | 0    | 141   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 5.1  | 5.8  | 5.0  | 5.0  | 6.0  | 6.1  | 5.2  |  |
| Highest: | 8.0  | 7.5  | 8.1  | 7.6  | 8.0  | 8.2  | 7.5  |  |
| Mean:    | -    | -    | -    | -    | -    | -    | -    |  |
| Median:  | 7.1  | 7.1  | 7.0  | 6.5  | 7.3  | 6.9  | 6.8  |  |

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       | 10      | 0       | 10      | 23      | 16      | 39      | 39      | 0    | 100   |
| 1996  | 0    | 0       | 0       | 10      | 10      | 20      | 40      | 20      | 20      | 0    | 100   |
| 1997  | 0    | 0       | 9       | 9       | 5       | 23      | 41      | 5       | 5       | 0    | 100   |
| 1998  | 0    | 0       | 6       | 13      | 25      | 31      | 13      | 13      | 13      | 0    | 100   |
| 1999  | 0    | 0       | 0       | 0       | 16      | 16      | 32      | 32      | 32      | 0    | 100   |
| 2000  | 0    | 0       | 0       | 0       | 29      | 21      | 14      | 14      | 14      | 0    | 100   |
| 2001  | 0    | 0       | 4       | 9       | 22      | 26      | 35      | 35      | 4       | 0    | 100   |
| Total | 0    | 0       | 5       | 5       | 16      | 23      | 27      | 20      | 5       | 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  | 2    | 8       | 13      | 28      | 34      | 61      | 30      | 6       | 0       | 0    | 182   |
| 1996  | 1    | 4       | 13      | 32      | 59      | 59      | 15      | 3       | 0       | 0    | 186   |
| 1997* | 0    | 1       | 14      | 24      | 46      | 40      | 18      | 2       | 0       | 0    | 145   |
| 1998  | 0    | 4       | 16      | 39      | 40      | 44      | 17      | 1       | 0       | 0    | 161   |
| 1999  | 0    | 4       | 15      | 35      | 47      | 46      | 49      | 15      | 1       | 0    | 212   |
| 2000  | 0    | 1       | 2       | 13      | 26      | 27      | 27      | 11      | 0       | 0    | 107   |
| 2001  | 3    | 5       | 6       | 29      | 46      | 76      | 61      | 18      | 0       | 1    | 245   |
| Total | 6    | 27      | 79      | 200     | 298     | 353     | 217     | 56      | 1       | 1    | 1238  |

\* One sample was not analyzed for pH in 1997.

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 4.3  | 4.4  | 4.7  | 4.6  | 4.7  | 4.9  | 4.4  |  |
| Highest: | 7.7  | 7.6  | 7.7  | 7.5  | 8.1  | 7.8  | 9.2  |  |
| Mean:    | -    | -    | -    | -    | -    | -    | -    |  |
| Median:  | 6.5  | 6.3  | 6.3  | 6.3  | 6.5  | 6.6  | 6.6  |  |

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       | 7       | 15      | 19      | 34      | 16      | 3       | 0       | 0    | 100   |
| 1996  | 1    | 2       | 7       | 17      | 32      | 32      | 8       | 2       | 0       | 0    | 100   |
| 1997  | 0    | 1       | 10      | 17      | 32      | 28      | 12      | 1       | 0       | 0    | 100   |
| 1998  | 0    | 2       | 10      | 24      | 25      | 27      | 11      | 1       | 0       | 0    | 100   |
| 1999  | 0    | 2       | 7       | 17      | 22      | 22      | 23      | 7       | 0       | 0    | 100   |
| 2000  | 0    | 1       | 2       | 12      | 24      | 25      | 25      | 10      | 0       | 0    | 100   |
| 2001  | 1    | 2       | 2       | 12      | 19      | 31      | 25      | 7       | 0       | 0    | 100   |
| Total | 0    | 2       | 6       | 16      | 24      | 29      | 18      | 5       | 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  | 5   | 5   | 15   | 2     | 1     | 0      | 2       | 1       | 0    | 31    |
| 1996  | 0  | 0   | 2   | 3    | 1     | 1     | 2      | 0       | 0       | 1    | 10    |
| 1997  | 0  | 4   | 4   | 6    | 4     | 0     | 1      | 1       | 1       | 1    | 22    |
| 1998  | 0  | 0   | 4   | 7    | 1     | 1     | 1      | 1       | 1       | 0    | 16    |
| 1999  | 0  | 0   | 8   | 13   | 3     | 0     | 0      | 0       | 0       | 1    | 25    |
| 2000  | 0  | 1   | 8   | 3    | 0     | 1     | 0      | 1       | 0       | 0    | 14    |
| 2001  | 0  | 2   | 4   | 2    | 2     | 2     | 1      | 1       | 4       | 5    | 23    |
| Total | 0  | 12  | 35  | 49   | 13    | 6     | 5      | 6       | 7       | 8    | 141   |

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

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 1    | 4    | 3    | 4    | 4    | 3    | 1    |  |
| Highest: | 170  | 305  | 243  | 175  | 309  | 102  | 455  |  |
| Mean:    | 29   | 70   | 46   | 42   | 29   | 20   | 123  |  |
| Median:  | 15   | 42   | 19   | 16   | 13   | 7    | 71   |  |

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  | 16  | 16  | 48   | 6     | 3     | 0      | 6       | 3       | 0    | 100   |
| 1996  | 0  | 0   | 20  | 30   | 10    | 10    | 20     | 0       | 0       | 10   | 100   |
| 1997  | 0  | 18  | 18  | 27   | 18    | 0     | 5      | 5       | 5       | 5    | 100   |
| 1998  | 0  | 0   | 25  | 44   | 6     | 6     | 6      | 6       | 6       | 0    | 100   |
| 1999  | 0  | 0   | 32  | 52   | 12    | 0     | 0      | 0       | 0       | 4    | 100   |
| 2000  | 0  | 7   | 57  | 21   | 0     | 7     | 0      | 7       | 0       | 0    | 100   |
| 2001  | 0  | 9   | 17  | 9    | 9     | 9     | 4      | 4       | 17      | 22   | 100   |
| Total | 0  | 9   | 25  | 35   | 9     | 4     | 4      | 4       | 5       | 6    | 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  | 53  | 44  | 70   | 2     | 1     | 1      | 2       | 2       | 7    | 182   |
| 1996  | 0  | 48  | 47  | 69   | 7     | 2     | 3      | 5       | 4       | 1    | 186   |
| 1997  | 0  | 37  | 33  | 61   | 9     | 0     | 0      | 2       | 1       | 3    | 146   |
| 1998  | 0  | 38  | 39  | 49   | 5     | 1     | 1      | 5       | 11      | 12   | 161   |
| 1999  | 0  | 65  | 57  | 54   | 5     | 6     | 5      | 5       | 5       | 10   | 212   |
| 2000  | 0  | 34  | 29  | 31   | 5     | 1     | 1      | 4       | 0       | 2    | 107   |
| 2001  | 0  | 33  | 55  | 108  | 8     | 9     | 6      | 12      | 6       | 8    | 245   |
| Total | 0  | 308 | 304 | 442  | 41    | 20    | 17     | 35      | 29      | 43   | 1239  |

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: | 324  | 215  | 314  | 412  | 344  | 441  | 835  |  |
| Mean:    | 24   | 21   | 22   | 45   | 31   | 22   | 43   |  |
| Median:  | 8    | 8    | 9    | 9    | 7    | 7    | 13   |  |

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  | 29  | 24  | 38   | 1     | 1     | 1      | 1       | 1       | 4    | 100   |
| 1996  | 0  | 26  | 25  | 37   | 4     | 1     | 2      | 3       | 2       | 1    | 100   |
| 1997  | 0  | 25  | 23  | 42   | 6     | 0     | 0      | 1       | 1       | 2    | 100   |
| 1998  | 0  | 24  | 24  | 30   | 3     | 1     | 1      | 3       | 7       | 7    | 100   |
| 1999  | 0  | 31  | 27  | 25   | 2     | 3     | 2      | 2       | 2       | 5    | 100   |
| 2000  | 0  | 32  | 27  | 29   | 5     | 1     | 1      | 4       | 0       | 2    | 100   |
| 2001  | 0  | 13  | 22  | 44   | 3     | 4     | 2      | 5       | 2       | 3    | 100   |
| Total | 0  | 25  | 25  | 36   | 3     | 2     | 1      | 3       | 2       | 3    | 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      | 2       | 5         | 7     |
| 1996                    | 0        | 0     | 0      | 1       | 2         | 3     |
| 1997                    | 1        | 1     | 0      | 1       | 3         | 6     |
| 1998                    | 0        | 0     | 0      | 2       | 3         | 5     |
| 1999                    | 0        | 0     | 0      | 1       | 2         | 3     |
| 2000                    | 0        | 0     | 1      | 1       | 0         | 2     |
| 2001                    | 0        | 0     | 0      | 2       | 3         | 5     |
| Total (#)               | 1        | 1     | 1      | 10      | 18        | 31    |
| Total (%)               | 3        | 3     | 3      | 32      | 58        | 100   |
| Soil Management Group 3 |          |       |        |         |           |       |
|                         | <45      | 45-79 | 80-119 | 120-199 | >199      | Total |
|                         | Very Low | Low   | Medium | High    | Very High |       |
| 1995                    | 0        | 2     | 4      | 2       | 0         | 8     |
| 1996                    | 0        | 0     | 0      | 0       | 0         | 0     |
| 1997                    | 0        | 2     | 0      | 1       | 1         | 4     |
| 1998                    | 0        | 2     | 0      | 1       | 3         | 6     |
| 1999                    | 0        | 1     | 0      | 2       | 4         | 7     |
| 2000                    | 0        | 1     | 0      | 1       | 1         | 3     |
| 2001                    | 0        | 1     | 0      | 1       | 5         | 7     |
| Total (#)               | 0        | 9     | 4      | 8       | 14        | 35    |
| Total (%)               | 0        | 26    | 11     | 23      | 40        | 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       | 4       | 3         | 8     |
| 1996                    | 0        | 0      | 2       | 0       | 1         | 3     |
| 1997                    | 1        | 1      | 0       | 3       | 3         | 8     |
| 1998                    | 0        | 0      | 2       | 1       | 2         | 5     |
| 1999                    | 0        | 4      | 2       | 4       | 1         | 11    |
| 2000                    | 0        | 3      | 2       | 0       | 1         | 6     |
| 2001                    | 0        | 1      | 0       | 1       | 4         | 6     |
| Total (#)               | 1        | 9      | 9       | 13      | 15        | 47    |
| Total (%)               | 2        | 19     | 19      | 28      | 32        | 100   |
| Soil Management Group 5 |          |        |         |         |           |       |
|                         | <60      | 60-114 | 115-164 | 165-269 | >269      | Total |
|                         | Very Low | Low    | Medium  | High    | Very High |       |
| 1995                    | 0        | 1      | 2       | 2       | 3         | 8     |
| 1996                    | 0        | 0      | 0       | 1       | 3         | 4     |
| 1997                    | 0        | 2      | 0       | 1       | 1         | 4     |
| 1998                    | 0        | 0      | 0       | 0       | 0         | 0     |
| 1999                    | 0        | 3      | 0       | 1       | 0         | 4     |
| 2000                    | 0        | 0      | 2       | 1       | 0         | 3     |
| 2001                    | 0        | 0      | 1       | 0       | 4         | 5     |
| Total (#)               | 0        | 6      | 5       | 6       | 11        | 28    |
| Total (%)               | 0        | 21     | 18      | 21      | 39        | 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        | 3   | 7      | 10   | 11        | 31    |
| 1996        | 0        | 0   | 2      | 2    | 6         | 10    |
| 1997        | 2        | 6   | 0      | 6    | 8         | 22    |
| 1998        | 0        | 2   | 2      | 4    | 8         | 16    |
| 1999        | 0        | 8   | 2      | 8    | 7         | 25    |
| 2000        | 0        | 4   | 5      | 3    | 2         | 14    |
| 2001        | 0        | 2   | 1      | 4    | 16        | 23    |
| Total #     | 2        | 25  | 19     | 37   | 58        | 141   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 56   | 103  | 32   | 60   | 49   | 47   | 67   |  |
| Highest: | 451  | 751  | 1016 | 859  | 522  | 428  | 1742 |  |
| Mean:    | 195  | 290  | 216  | 240  | 170  | 157  | 394  |  |
| Median:  | 201  | 245  | 171  | 173  | 158  | 139  | 358  |  |

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

| Summary (%) | Very Low | Low | Medium | High | Very High | Total |
|-------------|----------|-----|--------|------|-----------|-------|
| 1995        | 0        | 10  | 23     | 32   | 35        | 100   |
| 1996        | 0        | 0   | 20     | 20   | 60        | 100   |
| 1997        | 9        | 27  | 0      | 27   | 36        | 100   |
| 1998        | 0        | 13  | 13     | 25   | 50        | 100   |
| 1999        | 0        | 32  | 8      | 32   | 28        | 100   |
| 2000        | 0        | 29  | 36     | 21   | 14        | 100   |
| 2001        | 0        | 9   | 4      | 17   | 70        | 100   |
| Grand Total | 1        | 18  | 13     | 26   | 41        | 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      | 0       | 0         | 0     |
| 1996                    | 0        | 0     | 0      | 0       | 0         | 0     |
| 1997                    | 0        | 0     | 0      | 0       | 1         | 1     |
| 1998                    | 0        | 0     | 0      | 0       | 0         | 0     |
| 1999                    | 0        | 0     | 0      | 1       | 1         | 2     |
| 2000                    | 0        | 0     | 0      | 0       | 0         | 0     |
| 2001                    | 0        | 0     | 0      | 0       | 0         | 0     |
| Total (#)               | 0        | 0     | 0      | 1       | 2         | 3     |
| Total (%)               | 0        | 0     | 0      | 33      | 67        | 100   |
| Soil Management Group 2 |          |       |        |         |           |       |
|                         | <40      | 40-69 | 70-99  | 100-164 | >164      | Total |
|                         | Very Low | Low   | Medium | High    | Very High |       |
| 1995                    | 0        | 4     | 6      | 27      | 37        | 74    |
| 1996                    | 0        | 2     | 7      | 23      | 26        | 58    |
| 1997                    | 1        | 5     | 11     | 7       | 10        | 34    |
| 1998                    | 0        | 0     | 5      | 17      | 22        | 44    |
| 1999                    | 0        | 11    | 5      | 17      | 45        | 78    |
| 2000                    | 0        | 5     | 12     | 14      | 13        | 44    |
| 2001                    | 2        | 9     | 21     | 36      | 60        | 128   |
| Total (#)               | 3        | 36    | 67     | 141     | 213       | 460   |
| Total (%)               | 1        | 8     | 15     | 31      | 46        | 100   |
| Soil Management Group 3 |          |       |        |         |           |       |
|                         | <45      | 45-79 | 80-119 | 120-199 | >199      | Total |
|                         | Very Low | Low   | Medium | High    | Very High |       |
| 1995                    | 0        | 1     | 4      | 13      | 15        | 33    |
| 1996                    | 0        | 0     | 2      | 17      | 5         | 24    |
| 1997                    | 3        | 3     | 4      | 12      | 3         | 25    |
| 1998                    | 0        | 0     | 2      | 14      | 21        | 37    |
| 1999                    | 0        | 1     | 4      | 5       | 12        | 22    |
| 2000                    | 1        | 3     | 4      | 4       | 5         | 17    |
| 2001                    | 1        | 4     | 7      | 12      | 12        | 36    |
| Total (#)               | 5        | 12    | 27     | 77      | 73        | 194   |
| Total (%)               | 3        | 6     | 14     | 40      | 38        | 100   |

| Soil Management Group 4 |          |        |         |         |           |       |
|-------------------------|----------|--------|---------|---------|-----------|-------|
|                         | <55      | 55-99  | 100-149 | 150-239 | >239      | Total |
|                         | Very Low | Low    | Medium  | High    | Very High |       |
| 1995                    | 0        | 10     | 18      | 15      | 10        | 53    |
| 1996                    | 2        | 11     | 18      | 21      | 16        | 68    |
| 1997                    | 1        | 14     | 12      | 18      | 22        | 67    |
| 1998                    | 0        | 5      | 11      | 10      | 10        | 36    |
| 1999                    | 1        | 11     | 15      | 13      | 31        | 71    |
| 2000                    | 2        | 4      | 8       | 8       | 7         | 29    |
| 2001                    | 2        | 8      | 9       | 16      | 9         | 44    |
| Total (#)               | 8        | 63     | 91      | 101     | 105       | 368   |
| Total (%)               | 2        | 17     | 25      | 27      | 29        | 100   |
| Soil Management Group 5 |          |        |         |         |           |       |
|                         | <60      | 60-114 | 115-164 | 165-269 | >269      | Total |
|                         | Very Low | Low    | Medium  | High    | Very High |       |
| 1995                    | 1        | 1      | 2       | 1       | 5         | 10    |
| 1996                    | 2        | 4      | 1       | 5       | 6         | 18    |
| 1997                    | 1        | 1      | 4       | 5       | 0         | 11    |
| 1998                    | 1        | 3      | 3       | 1       | 2         | 10    |
| 1999                    | 0        | 1      | 5       | 6       | 1         | 13    |
| 2000                    | 1        | 2      | 3       | 3       | 6         | 15    |
| 2001                    | 0        | 1      | 2       | 0       | 3         | 6     |
| Total (#)               | 6        | 13     | 20      | 21      | 23        | 83    |
| Total (%)               | 7        | 16     | 24      | 25      | 28        | 100   |
| Soil Management Group 6 |          |        |         |         |           |       |
|                         | <60      | 60-114 | 115-164 | 165-269 | >269      | Total |
|                         | Very Low | Low    | Medium  | High    | Very High |       |
| 1995                    | 0        | 1      | 0       | 0       | 10        | 11    |
| 1996                    | 0        | 0      | 0       | 2       | 9         | 11    |
| 1997                    | 0        | 0      | 0       | 0       | 4         | 4     |
| 1998                    | 0        | 0      | 0       | 3       | 26        | 29    |
| 1999                    | 0        | 0      | 0       | 1       | 4         | 5     |
| 2000                    | 0        | 0      | 0       | 0       | 0         | 0     |
| 2001                    | 1        | 1      | 1       | 1       | 14        | 18    |
| Total (#)               | 1        | 2      | 1       | 7       | 67        | 78    |
| Total (%)               | 1        | 3      | 1       | 9       | 86        | 100   |

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

| Summary (#) | Very Low | Low | Medium | High | Very High | Un-known | Total |
|-------------|----------|-----|--------|------|-----------|----------|-------|
| 1995        | 1        | 17  | 30     | 56   | 77        | 1        | 182   |
| 1996        | 4        | 17  | 28     | 68   | 62        | 7        | 186   |
| 1997        | 6        | 23  | 31     | 42   | 40        | 4        | 146   |
| 1998        | 1        | 8   | 21     | 45   | 81        | 5        | 161   |
| 1999        | 1        | 24  | 29     | 43   | 94        | 21       | 212   |
| 2000        | 4        | 14  | 27     | 29   | 31        | 2        | 107   |
| 2001        | 6        | 23  | 40     | 65   | 98        | 13       | 245   |
| Grand Total | 23       | 126 | 206    | 348  | 483       | 53       | 1239  |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001  |  |
|----------|------|------|------|------|------|------|-------|--|
| Lowest:  | 32   | 32   | 33   | 56   | 41   | 18   | 28    |  |
| Highest: | 1841 | 948  | 1914 | 1226 | 1659 | 1147 | 28539 |  |
| Mean:    | 266  | 219  | 205  | 277  | 295  | 192  | 407   |  |
| Median:  | 166  | 169  | 152  | 206  | 212  | 136  | 165   |  |

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

| % summary   | Very Low | Low | Medium | High | Very High | Un-known | Total |
|-------------|----------|-----|--------|------|-----------|----------|-------|
| 1995        | 1        | 9   | 16     | 31   | 42        | 1        | 100   |
| 1996        | 2        | 9   | 15     | 37   | 33        | 4        | 100   |
| 1997        | 4        | 16  | 21     | 29   | 27        | 3        | 100   |
| 1998        | 1        | 5   | 13     | 28   | 50        | 3        | 100   |
| 1999        | 0        | 11  | 14     | 20   | 44        | 10       | 100   |
| 2000        | 4        | 13  | 25     | 27   | 29        | 2        | 100   |
| 2001        | 2        | 9   | 16     | 27   | 40        | 5        | 100   |
| Grand Total | 2        | 10  | 17     | 28   | 39        | 4        | 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     | 1      | 3       | 27        | 31    |
| 1996  | 0        | 0     | 0      | 0       | 10        | 10    |
| 1997  | 0        | 0     | 1      | 3       | 18        | 22    |
| 1998  | 0        | 1     | 0      | 1       | 14        | 16    |
| 1999  | 0        | 0     | 0      | 1       | 24        | 25    |
| 2000  | 0        | 0     | 0      | 1       | 13        | 14    |
| 2001  | 0        | 0     | 0      | 2       | 21        | 23    |
| Total | 0        | 1     | 2      | 11      | 127       | 141   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 71   | 205  | 95   | 38   | 169  | 126  | 156  |  |
| Highest: | 1344 | 854  | 1541 | 1588 | 1786 | 812  | 1341 |  |
| Mean:    | 512  | 564  | 486  | 476  | 525  | 430  | 531  |  |
| Median:  | 488  | 619  | 459  | 396  | 516  | 420  | 491  |  |

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     | 3      | 10      | 97        | 100   |
| 1996  | 0        | 0     | 0      | 0       | 100       | 100   |
| 1997  | 0        | 0     | 5      | 14      | 82        | 100   |
| 1998  | 0        | 6     | 0      | 6       | 88        | 100   |
| 1999  | 0        | 0     | 0      | 4       | 96        | 100   |
| 2000  | 0        | 0     | 0      | 7       | 93        | 100   |
| 2001  | 0        | 0     | 0      | 9       | 91        | 100   |
| Total | 0        | 1     | 1      | 8       | 90        | 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  | 2        | 6     | 6      | 22      | 146       | 182   |
| 1996  | 0        | 2     | 3      | 20      | 161       | 186   |
| 1997  | 0        | 0     | 3      | 21      | 122       | 146   |
| 1998  | 0        | 6     | 7      | 14      | 134       | 161   |
| 1999  | 0        | 5     | 11     | 23      | 173       | 212   |
| 2000  | 0        | 3     | 1      | 28      | 75        | 107   |
| 2001  | 0        | 5     | 3      | 30      | 207       | 245   |
| Total | 2        | 27    | 34     | 158     | 1018      | 1239  |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 16   | 36   | 69   | 47   | 42   | 28   | 42   |  |
| Highest: | 2683 | 2313 | 3409 | 2887 | 2188 | 1023 | 7342 |  |
| Mean:    | 495  | 473  | 454  | 604  | 475  | 362  | 551  |  |
| Median:  | 400  | 397  | 367  | 467  | 364  | 307  | 431  |  |

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        | 3     | 3      | 12      | 80        | 100   |
| 1996  | 0        | 1     | 2      | 11      | 87        | 100   |
| 1997  | 0        | 0     | 2      | 14      | 84        | 100   |
| 1998  | 0        | 4     | 4      | 9       | 83        | 100   |
| 1999  | 0        | 2     | 5      | 11      | 82        | 100   |
| 2000  | 0        | 3     | 1      | 26      | 70        | 100   |
| 2001  | 0        | 2     | 1      | 12      | 84        | 100   |
| Total | 0        | 2     | 3      | 13      | 82        | 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  | 29     | 2         | 31    |
| 1996  | 10     | 0         | 10    |
| 1997  | 22     | 0         | 22    |
| 1998  | 16     | 0         | 16    |
| 1999  | 24     | 1         | 25    |
| 2000  | 13     | 1         | 14    |
| 2001  | 23     | 0         | 23    |
| Total | 137    | 4         | 141   |

Percentages:

|  | 0-49   | >49       | Total |
|--|--------|-----------|-------|
|  | Normal | Excessive |       |
|  | 94     | 6         | 100   |
|  | 100    | 0         | 100   |
|  | 100    | 0         | 100   |
|  | 100    | 0         | 100   |
|  | 96     | 4         | 100   |
|  | 93     | 7         | 100   |
|  | 100    | 0         | 100   |
|  | 97     | 3         | 100   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 2    | 3    | 2    | 2    | 1    | 1    | 1    |  |
| Highest: | 66   | 15   | 20   | 36   | 138  | 104  | 19   |  |
| Mean:    | 12   | 6    | 6    | 11   | 13   | 12   | 7    |  |
| Median:  | 6    | 5    | 5    | 9    | 4    | 5    | 5    |  |

## 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  | 176    | 6         | 182   |
| 1996  | 181    | 5         | 186   |
| 1997  | 146    | 0         | 146   |
| 1998  | 150    | 11        | 161   |
| 1999  | 205    | 7         | 212   |
| 2000  | 105    | 2         | 107   |
| 2001  | 239    | 6         | 245   |
| Total | 1202   | 37        | 1239  |

Percentages:

|  | 0-49   | >49       | Total |
|--|--------|-----------|-------|
|  | Normal | Excessive |       |
|  | 97     | 3         | 100   |
|  | 97     | 3         | 100   |
|  | 100    | 0         | 100   |
|  | 93     | 7         | 100   |
|  | 97     | 3         | 100   |
|  | 98     | 2         | 100   |
|  | 98     | 2         | 100   |
|  | 97     | 3         | 100   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 1    | 1    | 1    | 1    | 1    | 1    | 1    |  |
| Highest: | 95   | 141  | 40   | 113  | 99   | 103  | 263  |  |
| Mean:    | 11   | 11   | 10   | 13   | 12   | 8    | 8    |  |
| Median:  | 6    | 7    | 7    | 7    | 6    | 5    | 4    |  |



## 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  | 30     | 1         | 31    |
| 1996  | 10     | 0         | 10    |
| 1997  | 21     | 1         | 22    |
| 1998  | 16     | 0         | 16    |
| 1999  | 23     | 2         | 25    |
| 2000  | 14     | 0         | 14    |
| 2001  | 21     | 2         | 23    |
| Total | 135    | 6         | 141   |

Percentages:

| 0-99   | >99       | Total |
|--------|-----------|-------|
| Normal | Excessive |       |
| 97     | 3         | 100   |
| 100    | 0         | 100   |
| 95     | 5         | 100   |
| 100    | 0         | 100   |
| 92     | 8         | 100   |
| 100    | 0         | 100   |
| 91     | 9         | 100   |
| 96     | 4         | 100   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 9    | 18   | 10   | 15   | 14   | 16   | 12   |  |
| Highest: | 112  | 63   | 105  | 60   | 199  | 84   | 116  |  |
| Mean:    | 36   | 38   | 50   | 31   | 46   | 37   | 50   |  |
| Median:  | 29   | 35   | 52   | 29   | 34   | 33   | 45   |  |

## 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  | 179    | 3         | 182   |
| 1996  | 180    | 6         | 186   |
| 1997  | 139    | 7         | 146   |
| 1998  | 151    | 10        | 161   |
| 1999  | 204    | 8         | 212   |
| 2000  | 107    | 0         | 107   |
| 2001  | 232    | 13        | 245   |
| Total | 1192   | 47        | 1239  |

Percentages:

|  | 0-99   | >99       | Total |
|--|--------|-----------|-------|
|  | Normal | Excessive |       |
|  | 98     | 2         | 100   |
|  | 97     | 3         | 100   |
|  | 95     | 5         | 100   |
|  | 94     | 6         | 100   |
|  | 96     | 4         | 100   |
|  | 100    | 0         | 100   |
|  | 95     | 5         | 100   |
|  | 96     | 4         | 100   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 3    | 3    | 2    | 3    | 2    | 2    | 3    |  |
| Highest: | 175  | 250  | 157  | 304  | 243  | 88   | 611  |  |
| Mean:    | 31   | 30   | 35   | 38   | 31   | 30   | 42   |  |
| Median:  | 27   | 22   | 29   | 29   | 24   | 27   | 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    | 3       | 28   | 31    |
| 1996  | 0    | 1       | 9    | 10    |
| 1997  | 1    | 2       | 19   | 22    |
| 1998  | 0    | 3       | 13   | 16    |
| 1999  | 2    | 8       | 15   | 25    |
| 2000  | 1    | 6       | 7    | 14    |
| 2001  | 0    | 0       | 23   | 23    |
| Total | 4    | 23      | 114  | 141   |

Percentages:

| <0.5 | 0.5-1.0 | >1   | Total |
|------|---------|------|-------|
| Low  | Medium  | High |       |
| 0    | 10      | 90   | 100   |
| 0    | 10      | 90   | 100   |
| 5    | 9       | 86   | 100   |
| 0    | 19      | 81   | 100   |
| 8    | 32      | 60   | 100   |
| 7    | 43      | 50   | 100   |
| 0    | 0       | 100  | 100   |
| 3    | 16      | 81   | 100   |

|          | 1995  | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|-------|------|------|------|------|------|------|--|
| Lowest:  | 0.6   | 0.8  | 0.4  | 0.9  | 0.4  | 0.4  | 1.4  |  |
| Highest: | 161.8 | 14.5 | 73.4 | 67.8 | 18.4 | 17.2 | 60.8 |  |
| Mean:    | 13.6  | 5.2  | 8.4  | 7.4  | 3.1  | 2.7  | 14.1 |  |
| Median:  | 4.0   | 3.7  | 3.2  | 1.7  | 1.2  | 1.0  | 7.3  |  |

## 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    | 44      | 135  | 182   |
| 1996  | 7    | 57      | 122  | 186   |
| 1997  | 1    | 41      | 104  | 146   |
| 1998  | 8    | 34      | 119  | 161   |
| 1999  | 18   | 55      | 139  | 212   |
| 2000  | 3    | 38      | 66   | 107   |
| 2001  | 7    | 33      | 205  | 245   |
| Total | 47   | 302     | 890  | 1239  |

Percentages:

| <0.5 | 0.5-1.0 | >1   | Total |
|------|---------|------|-------|
| Low  | Medium  | High |       |
| 2    | 24      | 74   | 100   |
| 4    | 71      | 66   | 100   |
| 1    | 28      | 71   | 100   |
| 5    | 21      | 74   | 100   |
| 8    | 26      | 66   | 100   |
| 3    | 36      | 62   | 100   |
| 3    | 13      | 84   | 100   |
| 4    | 24      | 72   | 100   |

|          | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |  |
|----------|------|------|------|------|------|------|------|--|
| Lowest:  | 0.3  | 0.3  | 0.4  | 0.1  | 0.1  | 0.4  | 0.2  |  |
| Highest: | 63.8 | 29.9 | 17.9 | 23.9 | 61.5 | 26.4 | 29.7 |  |
| Mean:    | 3.2  | 3.1  | 3.0  | 4.7  | 4.3  | 2.7  | 3.8  |  |
| Median:  | 1.6  | 1.5  | 1.6  | 1.9  | 1.6  | 1.2  | 1.9  |  |

## 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                                     |
| ALG       | Azalea                                     |
| APP       | Apples                                     |
| APR       | Apricots                                   |

| Crop Code | Crop Description          |
|-----------|---------------------------|
| ATF       | Athletic Field            |
| ASP       | Asparagus                 |
| BDR/BND   | Beans-dry                 |
| BLU/BLB   | Blueberries               |
| BNS       | Beans, Snap               |
| BRP       | Brocoli, Transplanted     |
| CBP       | Cabbage, Transplanted     |
| CBS       | Cabbage, Seeded           |
| CEM       | Cemetery                  |
| CFP       | Cauliflower, Transplanted |
| CHS       | Cherries, Sweet           |
| CHT       | Cherries, Tart            |
| EGG       | Eggplants                 |
| END       | Endives                   |
| FAR       | Fairway                   |
| FLA       | Flowering Annuals         |
| GPA       | Grapes, American          |
| GPF       | Grapes, French-American   |
| GPV       | Grapes, Vinifera          |
| GRA       | Grapes                    |
| GEN       | Green                     |
| 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                   |
| PEA       | Peas                      |
| PEP       | Peppers                   |
| PER       | Perennials                |
| PLM       | Plums                     |
| POP       | Popcorn                   |
| PRK       | Park                      |
| POT/PTO   | Potatoes                  |

| Crop Code | Crop Description                     |
|-----------|--------------------------------------|
| PUM       | Pumpkins                             |
| ROD       | Roadside                             |
| 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                           |
| TOM       | Tomatoes                             |
| TME       | Tomatoes, Early                      |
| TRE       | Christmas trees, Established         |
| TRF       | Tree fruits                          |
| TRT       | Christmas trees, Topdressing         |