# The Soils of Middlesex County

Volume 2

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# THE SOILS OF MIDDLESEX COUNTY

## Volume 2

REPORT NO. 56
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ONTARIO CENTRE FOR
SOIL RESOURCE EVALUATION*

by

T. P. Hagerty and M. S. Kingston
Resources Management Branch
Ontario Ministry of Agriculture and Food
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# INTRODUCTION

Volume 2 contains data on the morphological, physical and chemical properties of soil association members of Middlesex County. Statistical means of physical and chemical data are presented for generalized profiles. Engineering test data and detailed morphological, chemical and physical descriptions of typical examples of association members are also included. In addition, there is a brief outline of the analytical methods used to obtain chemical, physical and engineering test data. The Appendix provides a graphical display of the variability in textures of surface horizons for most association members.

# SITE ASSESSMENT

Site and soil characteristics were collected using one of three levels of assessment. The levels are differentiated by the number of soil properties measured at a site. Data from level one sites is based totally on field observations. Site characteristics and soil properties were described to the extent necessary to identify the soil landscape unit and the associated slope classes. This was the most frequent level of assessment.

Level two site assessments were conducted where soil samples were collected for laboratory analyses to verify or supplement field observations. At these sites, the horizon sequence and general characteristics of the soil were described, including soil colour, and drainage class. Each soil horizon was sampled and laboratory analyses were conducted to determine particle size distribution (soil texture), calcium carbonate content, pH in $CaCl_2$, and organic matter content.

A database for most of the soil association members was developed from the analytical results. Using statistical analyses, the mean value and range of specified soil properties were generated for the typical horizon sequence for most soil association members. This data is presented in tabular form under the heading, Generalized Profile Characteristics.

Using the generalized profile characteristics as a guide, the data from the individual level two site assessments was re-examined in order to select representative sites for more detailed level three site assessments. At least one detailed site assessment was undertaken for the most commonly occurring soil in each association. A soil pit, usually measuring one metre by one metre by one metre, was excavated at each site. The morphological characteristics of the soil profile were described, including horizon thickness, soil structure, consistency, and plasticity. The following laboratory analyses were conducted in addition to those mentioned previously for level two site assessments: bulk density, porosity, moisture retention, available moisture, saturated hydraulic conductivity, electrical conductivity, pH in $H_20$, cation exchange capacity, calcite/dolomite ratios, and engineering properties such as Atterberg Limits. This data, with the exception of the engineering test results, is presented in tabular form under the heading, Detailed Profile Characteristics. Table 1 contains the data on engineering properties.

Although organic landscape units were characterized, the intensity of inspection and sampled sites was significantly less than for the mineral soils in the County. The properties of organic soils were usually determined from field observations. In areas where the organic material appeared to be deepest, samples were collected for laboratory analyses to supplement and verify field observations. The following parameters were quantified: pH in $CaCl_2$, organic carbon content, rubbed fiber content, and pyrophosphate index. Where mineral soil horizons occurred within the organic profile, they were sampled and analyzed for particle size distribution (soil texture), calcium carbonate content, pH in $CaCl_2$, and organic matter content.

# ANALYTICAL METHODS

Many of the methods used for soil analyses are outlined in the *Manual on Soil Sampling and Methods of Analysis* (1). The appropriate section numbers are indicated in parentheses after the soil analyses, as follows:

a) Particle size analysis by pipette method, after pretreatment (2.11)

b) pH $CaCl_2$ (3.11), pH water (3.13)

c) Organic carbon by wet oxidation, using ortho-phanathroline-ferrous sulfate as indicator (3.613)

d) Calcium carbonate equivalent, using 6N HCl and some glassware modifications (3.41)

e) Cation exchange capacity (3.34)

f) Electrical conductivity (4.12)

g) Bulk density by core method (2.21)

h) Water retention by pressure-plate extraction (2.43)

i) Shrinkage was determined by a modification that used the COLE rod method (2.13)

Analytical methods not outlined in the *Manual for Soil Sampling and Methods of Analysis* (1), with their appropriate references indicated in parentheses, are as follows:

a) Saturated hydraulic conductivity followed procedures used by U.S. salinity lab U.S.D.A. (2)

b) Calcite-dolomite ratio determined by a gasometric procedure using the Chittick apparatus (3)

c) COLE rod method for determining shrinkage limit (4)

Volume of woody material, and von Post Decomposition values, for organic soils, were estimated from guidelines outlined in the *CanSIS Manual for Describing Soils in the Field* (5).

Engineering test data for selected soils is presented in Table 1. All tests, except for bulk density, porosity, free swell and COLE rod, were completed using American Society for Testing Materials (ASTM) methods (6). The test procedures and their ASTM numbers are as follows:

a) United classification D2487-69

b) AASHO classification D3282-73

c) Atterberg limits (LL - liquid limit, PL - Plastic Limit, PI - Plasticity Index) D423-4-72

d) Mechanical Analysis (Grain size analysis) D422-72

e) Compaction (Maximum dry density and percent optimum moisture) D698-70

f) Free swell was determined from a method outlined by Holtz and Gibbs (7)

## Table 1. Engineering test data for horizons of selected soils from Middlesex County.

| Horizon | Depth cm | Soil Classification Unified | Soil Classification AASHO | Atterberg Limits LL% | Atterberg Limits PL% | Atterberg Limits PI% | Mechanical Analysis % Passing #10 | % Passing #40 | % Passing #200 | % Smaller .05mm | % Smaller .005mm | Bulk Dens. g/cc | Porosity % | Compaction Max.D Dens. t/m³ | Compaction Opt. Moist % | Free Swell % | Cole Rod |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BENNINGTON ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Tavistock Soil - TVK** | | | | | | | | | | | | | | | | | |
| Ap | 0-20 | CL | A-4(8) | 29.0 | 20.5 | 8.5 | 99.1 | 97.8 | 90.9 | 83 | 26 | 1.36 | 46 | 1.739 | 17.0 | 20 | .062 |
| Aegj | 20-29 | CL-ML | A-4(8) | 23.0 | 18.5 | 4.5 | 99.6 | 98.5 | 89.8 | 80 | 22 | 1.50 | 43 | 1.829 | 14.8 | 10 | .030 |
| Btgj | 29-41 | CL | A-6(11) | 34.0 | 17.0 | 17.0 | 99.8 | 98.5 | 87.4 | 79 | 33 | 1.35 | 48 | 1.768 | 16.4 | 40 | .098 |
| Ckgj | 41-72 | CL | A-6(8) | 25.0 | 14.5 | 10.5 | 99.2 | 94.1 | 77.4 | 69 | 33 | 1.41 | 48 | 1.873 | 15.5 | 20 | .052 |
| IICkgj | 72-100 | CI | A-6(11) | 36.0 | 17.5 | 18.5 | 99.8 | 99.5 | 98.8 | 98 | 75 | 1.51 | 44 | 1.716 | 21.2 | 40 | .085 |
| **Tavistock Soil- Till Phase - TVK.T** | | | | | | | | | | | | | | | | | |
| Ap | 0-18 | CL-ML | A-4(13) | 29.9 | 22.1 | 17.8 | 100 | 99.2 | 92.6 | 77 | 19 | 1.34 | 46 | 1.638 | 19.2 | 10 | .022 |
| Ae | 18-28 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | - |
| Btgj | 28-44 | CL | A-6(11) | 30.3 | 18.3 | 12.0 | 100 | 99.8 | 95.7 | 80 | 25 | 1.35 | 45 | 1.777 | 15.9 | 15 | .070 |
| Ckgj | 44-51 | CL-ML | A-4(11) | 23.5 | 18.6 | 4.9 | 99.5 | 98.6 | 91.3 | 78 | 21 | 1.35 | 51 | 1.853 | 13.2 | 5 | - |
| IICkgj | 51-85 | CL | A-6(10) | 29.2 | 15.6 | 13.6 | 98.9 | 96.5 | 83.9 | 81 | 51 | 1.52 | 42 | 1.858 | 14.9 | 10 | .067 |
| **BLACKWELL ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Blackwell Soil - BCW** | | | | | | | | | | | | | | | | | |
| Ap | 0-14 | MH-OH | A-7-6(20) | 61.5 | 43.7 | 17.8 | 100 | 99.6 | 92.0 | 89 | 63 | 0.87 | 60 | 1.383 | 29.6 | 52 | .136 |
| Bg1 | 14-28 | MH-OH | A-7-6(20) | 63.9 | 44.3 | 19.6 | 100 | 99.6 | 94.6 | 93 | 68 | 1.08 | 56 | 1.378 | 31.1 | 40 | .146 |
| Bg2 | 28-47 | MH-OH | A-7-6(20) | 63.9 | 44.3 | 19.6 | 100 | 99.6 | 94.6 | 93 | 68 | 1.14 | 56 | 1.378 | 31.1 | 60 | .154 |
| Ckg1 | 47-64 | MH-OH | A-7-6(19) | 57.0 | 45.2 | 11.8 | 100 | 99.8 | 97.4 | 97 | 67 | 1.16 | 55 | 1.448 | 29.8 | 40 | .141 |
| Ckg2 | 64-110 | MH-OH | A-7-6(19) | 57.0 | 45.2 | 11.8 | 100 | 99.8 | 97.4 | 97 | 67 | 1.05 | 59 | 1.448 | 29.8 | 40 | .125 |
| **BOOKTON ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Berrien Soil - BRR** | | | | | | | | | | | | | | | | | |
| Ap | 0-26 | SC | A-2-4 | N.P. | N.P. | N.P. | 99.6 | 98.8 | 32.6 | 31 | 15 | 1.27 | 48 | 1.625 | 18.7 | 20 | .035 |
| Bmgj | 26-45 | SC | A-3 | N.P. | N.P. | N.P. | 100 | 99.8 | 22.3 | 17 | 13 | 1.43 | 45 | 1.851 | 12.1 | 20 | .015 |
| Ckgj | 45-60 | SC | A-3 | N.P. | N.P. | N.P. | 99.0 | 95.2 | 19.5 | 0 | 0 | 1.45 | 48 | 1.786 | 11.8 | 10 | - |
| IICkgj | 60-110 | CI | A-6(13) | 34.5 | 23.6 | 10.9 | 100 | 99.6 | 89.7 | 92 | 68 | 1.44 | 45 | 1.750 | 18.0 | 20 | .095 |
| **BRANT ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Tuscola Soil - TUC** | | | | | | | | | | | | | | | | | |
| Ap | 0-18 | CL | A-4(7) | N.P. | N.P. | N.P. | 99.6 | 98.8 | 68.9 | 49 | 16 | 1.36 | 51 | 1.720 | 15.7 | 10 | .021 |
| Bmgj1 | 18-31 | CL | A-4(8) | N.P. | N.P. | N.P. | 100 | 99.6 | 73.4 | 50 | 18 | 1.44 | 49 | 1.800 | 14.9 | 10 | .025 |
| Bmgj2 | 31-49 | CL | A-4(8) | N.P. | N.P. | N.P. | 100 | 99.6 | 74.2 | 50 | 15 | 1.47 | 45 | 1.837 | 13.1 | 10 | - |
| Ckgj | 49-110 | CL | A-4(8) | N.P. | N.P. | N.P. | 100 | 99.4 | 78.6 | 58 | 14 | 1.59 | 41 | 1.898 | 12.2 | 5 | - |

| Horizon | Depth cm | Soil Classification Unified | Soil Classification AASHO | Atterberg Limits LL% | Atterberg Limits PL% | Atterberg Limits PI% | Mechanical Analysis % Passing #10 | % Passing #40 | % Passing #200 | % Smaller .05mm | % Smaller .005mm | Bulk Dens. g/cc | Porosity % | Compaction Max.D Dens. t/m³ | Compaction Opt. Moist % | Free Swell % | Cole Rod |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRANTFORD ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Beverly Soil - BVY** | | | | | | | | | | | | | | | | | |
| Ap | 0-22 | ML | A-4(8) | 28.7 | 23.7 | 5.0 | 99.5 | 97.4 | 80.1 | 70 | 21 | 1.01 | 56 | 1.711 | 16.8 | 25 | .111 |
| Bmgj | 22-35 | MI-OI | A-7-5(17) | 47.2 | 30.3 | 16.9 | 99.6 | 97.6 | 91.2 | 90 | 60 | 1.39 | 42 | 1.569 | 22.3 | 36 | .111 |
| Btgj | 35-54 | CI-MI-OI | A-7-6(16) | 45.7 | 27.3 | 18.4 | 99.9 | 99.1 | 94.9 | 94 | 65 | 1.37 | 40 | 1.585 | 21.0 | 30 | .124 |
| Ckg | 54-105 | CI | A-7-5(14) | 40.0 | 24.4 | 15.6 | 99.9 | 99.5 | 97.6 | 94 | 68 | 1.42 | 35 | 1.692 | 18.5 | 43 | .138 |
| **BRYANSTON ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Thorndale Soil - THN** | | | | | | | | | | | | | | | | | |
| Ap | 0-21 | CI | A-7-5(16) | 42.2 | 31.9 | 10.3 | 97.9 | 93.0 | 76.2 | 70 | 21 | 0.97 | 56 | 1.455 | 24.7 | 25 | .049 |
| Bmgj | 21-37 | ML | A-4(13) | 29.8 | 23.2 | 6.6 | 98.8 | 95.2 | 80.0 | 75 | 23 | 1.28 | 46 | 1.635 | 20.4 | 10 | .035 |
| Bt | 37-47 | CL | A-6(11) | 32.3 | 18.0 | 14.3 | 98.6 | 94.7 | 77.4 | 70 | 32 | 1.34 | 41 | 1.762 | 17.2 | 40 | .078 |
| Ckgj | 47-100 | CL | A-6(8) | 26.9 | 15.3 | 11.6 | 89.0 | 83.2 | 65.1 | 60 | 30 | 1.50 | 43 | 1.922 | 13.4 | 0 | .073 |
| **BURFORD ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Burford Soil - BUF** | | | | | | | | | | | | | | | | | |
| Ap | 0-18 | CH | A-5(11) | 42.3 | 34.9 | 7.4 | 75.2 | 66.0 | 52.0 | 13 | 5 | 0.94 | 61 | 1.767 | 17.7 | 25 | .064 |
| Bmk | 18-43 | SC | A-2-4 | N.P. | N.P. | N.P. | 65.0 | 49.5 | 32.7 | 13 | 8 | - | - | 2.060 | 1.03 | 28 | .028 |
| Ck | 43-105 | SW | A-1-6 | N.P. | N.P. | N.P. | 50.7 | 21.5 | 1.0 | 1 | 1 | - | - | N.S.M. | N.S.M. | 15 | - |
| **CALEDON ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Caledon Soil - CAD** | | | | | | | | | | | | | | | | | |
| Ap | 0-25 | SC | A-2-4 | N.P. | N.P. | N.P. | 94.0 | 75.5 | 27.6 | 22 | 10 | 1.27 | 47 | 1.846 | 14.4 | 5 | - |
| Bm1 | 25-38 | SC | A-2-4 | N.P. | N.P. | N.P. | 95.7 | 77.4 | 26.1 | 23 | 10 | 1.35 | 52 | 1.911 | 12.7 | 10 | - |
| Bm2 | 38-72 | SC | A-3 | N.P. | N.P. | N.P. | 76.9 | 53.1 | 14.2 | 13 | 7 | 1.30 | 46 | 1.982 | 10.5 | 10 | - |
| Bt | 72-84 | SC | A-3 | N.P. | N.P. | N.P. | 79.7 | 55.2 | 13.1 | 12 | 7 | 1.22 | 55 | 1.993 | 10.9 | 10 | - |
| IICk | 84-110 | SW-SM | A-3 | N.P. | N.P. | N.P. | 87.7 | 55.2 | 9.8 | 10 | 3 | 1.36 | 50 | 1.822 | 12.1 | 10 | - |
| **FOX ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Brady Soil - BAY** | | | | | | | | | | | | | | | | | |
| Ap | 0-18 | ML | A-2-4 | 24.0 | 20.5 | 3.5 | 89.4 | 60.3 | 25.3 | 22 | 10 | 1.43 | 44 | 1.853 | 13.3 | 30 | - |
| Bt | 18-31 | GM-GC | A-2 | NP | NP | NP | 85.4 | 58.5 | 24.3 | 23 | 14 | 1.50 | 42 | 1.891 | 11.7 | 30 | .021 |
| Ckgj | 31-50 | GW | A-1 | NP | NP | NP | 76.2 | 35.7 | 6.7 | 6 | 0 | 1.42 | 46 | 1.196 | 10.6 | 20 | - |
| Ck | 50-100 | GW | A-3 | NP | NP | NP | 97.6 | 90.1 | 2.4 | 1 | 0 | 1.37 | 48 | 1.675 | 14.8 | 0 | - |
| **HONEYWOOD ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Embro Soil - EBR** | | | | | | | | | | | | | | | | | |
| Ap | 0-30 | MI | A-6(14) | 36.4 | 25.5 | 10.9 | 98.9 | 95.6 | 83.1 | 75 | 21 | 1.32 | 43 | 1.613 | 20.6 | 30 | .079 |
| Bmgj | 30-63 | CL | A-6(12) | 32.3 | 19.5 | 12.8 | 98.3 | 93.9 | 78.8 | 68 | 25 | 1.46 | 40 | 1.785 | 16.5 | 30 | .084 |
| IIBmgj | 63-78 | CL | A-6(11) | 28.8 | 18.0 | 10.8 | 96.3 | 91.6 | 76.8 | 67 | 24 | 1.42 | 47 | 1.894 | 13.5 | 20 | .068 |
| IICkgj | 78-110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | .100 |

| Horizon | Depth cm | Soil Classification Unified | Soil Classification AASHO | Atterberg Limits LL% | Atterberg Limits PL% | Atterberg Limits PI% | Mechanical Analysis % Passing #10 | % Passing #40 | % Passing #200 | % Smaller .05mm | % Smaller .005mm | Bulk Dens. g/cc | Porosity % | Compaction Max.D Dens. t/m$^3$ | Compaction Opt. Moist % | Free Swell % | Cole Rod |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HURON ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Perth Soil - PTH** | | | | | | | | | | | | | | | | | |
| Ap | 0-19 | CI-MI | A-7-6(13) | 43.0 | 26.5 | 16.5 | 95.1 | 92.3 | 85.6 | 82 | 35 | 1.22 | 51 | 1.542 | 24.2 | 40 | .088 |
| Bmgj | 19-31 | CI | A-7-6(14) | 46.0 | 24.0 | 22.0 | 94.9 | 90.3 | 82.3 | 78 | 41 | 1.16 | 55 | 1.577 | 21.4 | 40 | .119 |
| Btgj | 31-45 | CI | A-7-6(14) | 45.0 | 23.5 | 21.5 | 85.7 | 80.4 | 70.3 | 69 | 43 | 1.23 | 53 | 1.711 | 18.1 | 50 | .094 |
| Ckgj | 45-85 | CI | A-7-6(13) | 41.5 | 19.0 | 22.5 | 82.3 | 78.9 | 75.3 | 74 | 58 | 1.47 | 44 | 1.823 | 15.3 | 40 | .059 |
| **Brookston Soil - BKN** | | | | | | | | | | | | | | | | | |
| Ap | 0-11 | CH-MH | A-7-6(12) | 56.8 | 29.5 | 27.3 | 99.3 | 95.8 | 78.3 | 74 | 46 | 1.10 | 54 | 1.483 | 25.4 | 40 | .133 |
| Bg1 | 11-38 | CI | A-7-6(12) | 47.1 | 17.0 | 30.1 | 99.6 | 97.0 | 81.8 | 77 | 56 | 1.35 | 44 | 1.622 | 21.3 | 60 | .131 |
| Bg2 | 38-61 | CI | A-7-6(12) | 47.1 | 17.0 | 30.1 | 99.6 | 97.0 | 81.8 | 77 | 56 | 1.39 | 43 | 1.622 | 21.3 | 40 | .127 |
| Ckg | 61-100 | CI | A-6(10) | 38.2 | 14.9 | 23.3 | 91.7 | 87.5 | 75.9 | 72 | 48 | 1.44 | 46 | 1.793 | 18.2 | 20 | .087 |
| **MELBOURNE ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Ekfrid Soil - EKF** | | | | | | | | | | | | | | | | | |
| Ap | 0-20 | CI | A-7-6(15) | 49.5 | 27.5 | 22.0 | 99.8 | 97.9 | 90.8 | 91 | 57 | 1.10 | 56 | 1.481 | 22.4 | 40 | .098 |
| Bmgj | 20-33 | CH | A-7-6(18) | 52.5 | 24.5 | 28.0 | 100 | 97.4 | 92.9 | 93 | 66 | 1.31 | 49 | 1.563 | 22.3 | 50 | .102 |
| Btgj | 33-50 | CH | A-7-6(20) | 58.0 | 24.0 | 34.0 | 100 | 98.8 | 96.1 | 96 | 73 | 1.56 | 39 | 1.574 | 22.0 | 60 | .112 |
| Ckgj | 50-61 | CI-CH | A-7-6(17) | 49.5 | 21.0 | 28.5 | 100 | 99.4 | 98.2 | 98 | 75 | 1.44 | 46 | 1.634 | 21.8 | 60 | .109 |
| Ckg | 61-90 | CI | A-7-6(16) | 48.0 | 21.5 | 26.5 | 100 | 99.6 | 98.1 | 98 | 82 | 1.45 | 46 | 1.607 | 22.1 | 60 | .101 |
| **MURIEL ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Muriel Soil - MUI** | | | | | | | | | | | | | | | | | |
| Ap | 0-22 | ML-OL | A-4(14) | 34.8 | 25.3 | 9.5 | 99.0 | 96.8 | 86.9 | 80 | 33 | 1.12 | 55 | 1.647 | 20.2 | 10 | .051 |
| Bm | 22-28 | ML-OL | A-4(13) | 27.7 | 23.0 | 4.7 | 99.0 | 96.6 | 85.9 | 79 | 26 | 1.13 | 56 | 1.709 | 17.6 | 10 | .066 |
| Bt1 | 28-38 | MI-OI | A-7-6(16) | 40.9 | 30.2 | 10.7 | 99.2 | 98.3 | 91.7 | 86 | 54 | 1.35 | 47 | 1.660 | 21.0 | 50 | .121 |
| Bt2 | 38-71 | MI-OI | A-7-6(16) | 42.1 | 31.2 | 10.9 | 99.4 | 98.2 | 93.1 | 92 | 58 | 1.42 | 45 | 1.553 | 21.2 | 30 | .107 |
| Ckgj | 71-102 | MI-OI | A-4(16) | 38.4 | 29.5 | 8.9 | 98.4 | 96.6 | 91.4 | 89 | 56 | 1.40 | 47 | 1.710 | 19.3 | 30 | .089 |
| **PLAINFIELD ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Plainfield Soil - PFD** | | | | | | | | | | | | | | | | | |
| Ap | 0-21 | SC | A-3 | N.P. | N.P. | N.P. | 99.7 | 98.0 | 17.3 | 14 | 8 | 1.25 | 52 | 1.785 | 13.2 | 10 | - |
| Bm1 | 21-31 | SP-SM | A-3 | N.P. | N.P. | N.P. | 100 | 99.2 | 7.7 | 0 | 0 | 1.33 | 50 | 1.768 | 13.4 | 10 | - |
| Bm2 | 31-102 | SP-SM | A-3 | N.P. | N.P. | N.P. | 100 | 99.2 | 7.7 | 0 | 0 | 1.33 | 51 | 1.768 | 13.4 | 10 | - |
| BC | 102-119 | SP-SM | A-3 | N.P. | N.P. | N.P. | 100 | 99.2 | 7.7 | 0 | 0 | 1.22 | 56 | 1.768 | 13.4 | 0 | - |
| Ck | 119-149 | SP | A-3 | N.P. | N.P. | N.P. | 100 | 99.7 | 1.1 | 0 | 0 | 1.33 | 50 | 1.628 | 16.2 | 0 | - |
| **Walsingham Soil - WAM** | | | | | | | | | | | | | | | | | |
| Ap | 0-15 | SC | A-3 | N.P. | N.P. | N.P. | 100 | 99.7 | 22.7 | 12 | 6 | 1.15 | 58 | 1.640 | 15.8 | 10 | - |
| Bm | 15-43 | SP-SM | A-3 | N.P. | N.P. | N.P. | 100 | 99.7 | 7.5 | 0 | 0 | 1.17 | 56 | 1.685 | 15.4 | 10 | - |
| Bmgj1 | 43-65 | SP-SM | A-3 | N.P. | N.P. | N.P. | 100 | 99.3 | 11.5 | 0 | 0 | 1.27 | 55 | 1.720 | 14.2 | 20 | - |
| Bmgj2 | 65-87 | SP-SM | A-3 | N.P. | N.P. | N.P. | 100 | 99.3 | 11.5 | 0 | 0 | 1.35 | 50 | 1.720 | 14.2 | 10 | - |
| Bg | 87-116 | - | - | - | - | - | - | - | - | - | - | 1.34 | 52 | - | - | 2 | - |
| Ckg | 116-150 | CL | A-3 | N.P. | N.P. | N.P. | 100 | 99.9 | 13.0 | 0 | 0 | 1.41 | 45 | 1.699 | 15.3 | 8 | - |

| Horizon | Depth cm | Soil Classification Unified | Soil Classification AASHO | Atterberg Limits LL% | Atterberg Limits PL% | Atterberg Limits PI% | Mechanical Analysis % Passing #10 | % Passing #40 | % Passing #200 | % Smaller .05mm | % Smaller .005mm | Bulk Dens. g/cc | Porosity % | Compaction Max.D Dens. t/m³ | Compaction Opt. Moist % | Free Swell % | Cole Rod |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TEESWATER ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Teeswater Soil - TEW** | | | | | | | | | | | | | | | | | |
| Ap | 0-30 | MI-OI | A-5(16) | 41.1 | 31.6 | 9.5 | 99.6 | 97.6 | 80.9 | 73 | 12 | 0.93 | 64 | 1.450 | 25.4 | 22 | .042 |
| Ae | 30-41 | SC | A-4(5) | N.P. | N.P. | N.P. | 100 | 96.5 | 61.3 | 48 | 8 | 1.15 | 55 | 1.897 | 10.8 | 4 | - |
| Bm | 41-52 | SC | A-4(5) | N.P. | N.P. | N.P. | 100 | 96.5 | 61.3 | 48 | 8 | 1.35 | 39 | 1.897 | 10.8 | 0 | - |
| Bt | 52-73 | CL | A-6(9) | 29.0 | 16.5 | 12.5 | 91.9 | 89.5 | 68.3 | 60 | 27 | 1.51 | 30 | 1.823 | 15.3 | 28 | .111 |
| IICk1 | 73-83 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8 | - |
| IICk2 | 83-110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - |
| **WALSHER ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Vittoria Soil - VIT** | | | | | | | | | | | | | | | | | |
| Ap | 0-23 | SC | A-4(1) | N.P. | N.P. | N.P. | 99.8 | 99.2 | 38.9 | 29 | 7 | 1.14 | 52 | 1.691 | 15.6 | 15 | - |
| Bm | 23-34 | SC | A-4(2) | N.P. | N.P. | N.P. | 100 | 99.6 | 46.1 | 22 | 5 | 1.21 | 59 | 1.728 | 14.5 | 0 | - |
| Aegj | 34-49 | SC | A-4(2) | N.P. | N.P. | N.P. | 100 | 99.6 | 46.1 | 22 | 5 | 1.29 | 54 | 1.728 | 14.5 | 5 | - |
| Btgj | 49-61 | SC | A-2-4 | N.P. | N.P. | N.P. | 100 | 99.8 | 27.1 | 17 | 10 | 1.42 | 48 | 1.829 | 13.6 | 10 | - |
| IICkg | 61-110 | CL | A-4(8) | N.P. | N.P. | N.P. | 100 | 99.6 | 92.8 | 84 | 14 | 1.35 | 50 | 1.739 | 14.6 | 0 | - |
| **WATTFORD ASSOCIATION** | | | | | | | | | | | | | | | | | |
| **Wattford Soil - WAT** | | | | | | | | | | | | | | | | | |
| Ap | 0-24 | SC | A-3 | N.P. | N.P. | N.P. | 97.8 | 92.9 | 20.9 | 18 | 8 | 1.26 | 52 | 1.855 | 11.4 | 20 | - |
| Bm | 24-53 | SP-SM | A-3 | N.P. | N.P. | N.P. | 96.9 | 90.6 | 11.1 | 3 | 0 | 1.41 | 46 | 1.870 | 11.5 | 10 | - |
| Bt | 53-71 | SC | A-3 | N.P. | N.P. | N.P. | 94.5 | 89.0 | 21.4 | 18 | 13 | 1.33 | 49 | 1.950 | 11.3 | 20 | - |
| Ck | 71-133 | SP | A-3 | N.P. | N.P. | N.P. | 99.9 | 96.3 | 4.5 | 0 | 0 | 1.22 | 54 | 1.742 | 12.3 | 10 | - |

# SOIL DESCRIPTIONS AND ANALYSES

The soil descriptions and tables of analytical data which follow are arranged in alphabetical order by soil association. The individual members of the association are identified with their respective drainage classes. There is a brief description of the origin of the parent materials and the textural characteristics of the soil materials. Generalized profile characteristics have been compiled for each association member. Mean values for the percentage gravel, sand, silt and clay for the typical horizon sequence appear in tabular form. The textural class listed is based on these data. Mean values are also reported for the depth to the base of the horizon, percentage organic matter content and pH in $CaCl_2$. In addition, the drainage class and usual taxonomic classification of the association member is indicated.

Detailed soil profile descriptions accompany some of the generalized descriptions. They provide data from specific sites which were described and analyzed for a range of morphological, physical and chemical soil properties. A detailed site description is also included. Engineering test data is presented in Table 1.

Dashes which appear in the detailed profile tables indicate that the soil property was not determined analytically. For example, in mineral soils, C horizons were not analyzed for cation exchange capacity or organic matter content. Similarly, the carbonate content was not determined in A and B horizons where the pH of those horizons was less than 7.0.

Information on the organic soil landscapes units appears following the mineral soil descriptions. A generalized and detailed profile description is presented for each landscape unit. Where dashes occur within the tables no analytical results are available, usually because of insufficient sample size. In other cases, the dashes are present because it is not a relevant property. For example, it is inappropriate to determine the carbonate content of organic soil horizons because of the relatively low pH values.

The taxonomic classifications and nomenclature used in the generalized and detailed profile descriptions are from the *Canadian System of Soil Classification* (8). Criteria for texture, structure, consistence, and mottles are from the *CanSIS Manual for Describing Soils in the Field* (5). Soil colour is from the *Munsell Soil Colour Charts* (9).

The following abbreviations are used in the tables of data for the generalized and detailed profile descriptions.

Org. M - Organic Matter
$CaCO_3$ - Calcium Carbonate Equivalent
Grav. - Gravel
VF Sand - Very fine sand
Hydr. Cond. - Saturated Hydraulic Conductivity
Elec. Cond. - Electrical Conductivity
CEC - Cation Exchange Capacity
Cal/Dol Ratio - Calcite/Dolomite Ratio

**Textural Classes - Mineral Horizons**

C - Clay
CL - Clay loam
CS - Coarse sand
CSL - Coarse sandy loam
FS - Fine sand
FSCL - Fine sandy clay loam
FSL - Fine sandy loam
GCS - Gravelly coarse sand
GCSL - Gravelly coarse sandy loam
GL - Gravelly loam
GLS - Gravelly loamy sand
GS - Gravelly sand
GSL - Gravelly sandy loam
HC - Heavy Clay
L - Loam
LCS - Loamy coarse sand
LFS - Loamy fine sand
LS - Loamy sand
LVFS- Loamy very fine sand
S - Sand
SC - Sandy clay
SI - Silt
SIC - Silty clay
SIL - Silt loam
SICL - Silty clay loam
SCL - Sandy clay loam
SL - Sandy loam
VFS - Very fine sand
VFSCL - Very fine sandy clay loam
VFSL - Very fine sandy loam
VGCS - Very gravelly coarse sand
VGLCS - Very gravelly loamy coarse sand

**Peat Materials - Organic Horizons**

LIM - Limnic material, diatomaceous earth, occasionally mixed with some marl
SFP - Sedge fen peat
WSFP - Woody sedge fen peat
WFP - Woody forest peat

**ASSOCIATION MEMBERS** Bennington, well drained
Tavistock, imperfectly drained
Maplewood, poorly drained

**PARENT MATERIALS** 40 to 100 cm of loamy textures over clayey glaciolacustrine material, or clayey glacial till (till phase)

# BENNINGTON SOIL (BNG)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 8 | 23 | 1 | 24 | 15 | 56 | 20 | SIL | 4.4 | 7.2 | 1.4 |
| Bm | 5 | 47 | 1 | 21 | 11 | 61 | 18 | SIL | 2.3 | 7.1 | 1.5 |
| Bt | 3 | 57 | 0 | 28 | 15 | 46 | 26 | SIL | 1.0 | 7.2 | 0.6 |
| IICk | 6 | 100 | 1 | 3 | 0 | 52 | 45 | SIC | - | 7.5 | 21.5 |

# BENNINGTON SOIL - TILL PHASE (BNG.T)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 3 | 19 | 0 | 29 | 19 | 51 | 20 | SIL | 5.4 | 7.3 | 1.9 |
| Bm | 2 | 53 | 0 | 36 | 31 | 55 | 11 | SIL | 2.1 | 7.0 | 0.3 |
| Bt | 1 | 70 | 1 | 23 | 12 | 60 | 17 | SIL | 0.3 | 6.6 | - |
| IICk | 3 | | 4 | 17 | 6 | 48 | 35 | SICL | - | 7.4 | 23.2 |

# TAVISTOCK SOIL (TVK)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 29 | 23 | 0 | 36 | 18 | 45 | 20 | L | 4.00 | 7.1 | 1.8 |
| Bmgj | 25 | 53 | 0 | 37 | 21 | 44 | 19 | L | 1.0 | 7.1 | 3.2 |
| IIBtgj | 8 | 85 | 0 | 10 | 3 | 51 | 40 | SICL | 0.7 | 7.2 | 0.8 |
| IICkgj | 31 | | 0 | 6 | 1 | 55 | 40 | SICL | - | 7.6 | 25. |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### TAVISTOCK SOIL ONTARIO 1987 PROFILE NO. TPHD020

LOCATION Township of London, Lot 28, Con. VII, NTS Map Area 40P/3, 17 TPT 6920 6372

ELEVATION 274 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Nearly level to very gently sloping glaciolacustrine plain, loamy glaciolacustrine material over clayey glaciolacustrine sediments

SLOPE 2.5% simple

SOIL WATER REGIME Imperfectly drained, conductivity low, saturation period medium to long

STONINESS Nonstony

CLASSIFICATION Gleyed Gray Brown Luvisol

STATUS Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-20 (16-20) | 10YR4/2m | SIL | weak to moderate, very coarse, angular blocky | weak to moderate, medium to coarse, subangular blocky | friable, slightly sticky, plastic | |
| Aegj | 20-29 (5-11) | 10YR5/3m | SIL | moderate, medium, platy | moderate, fine, platy | friable, slightly sticky, slightly plastic | common, medium, prominent, 10YR5/6 |
| Btgj | 29-41 (5-15) | 7.5YR4/2m | SICL | moderate to strong, medium, platy | moderate, fine, subangular blocky | friable, slightly sticky, plastic | common, medium, prominent, 10YR5/6 |
| Ckgj | 41-72 (30-49) | 10YR6/3m | SIC | strong, medium, platy | moderate to strong, fine, platy | friable, slightly sticky, plastic | common, medium, prominent, 10YR6/6 |
| IICkgj | 72-100 | 10YR5/4m | SIL | strong, medium, platy | strong, fine, platy | firm, sticky, very plastic | common, medium, distinct, 10YR5/6 |

| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sand Fraction % | | | | | | | | | | |
| Ap | 0-20 | 1 | 1 | 1 | 2 | 4 | 11 | 19 | 63 | 18 | 7 | 1.36 | 46 |
| Aegj | 20-29 | 1 | 0 | 1 | 2 | 4 | 12 | 19 | 66 | 15 | 6 | 1.50 | 43 |
| Btgj | 29-41 | 0 | 1 | 1 | 2 | 5 | 11 | 20 | 48 | 33 | 15 | 1.35 | 48 |
| Ckgj | 41-72 | 1 | 0 | 1 | 1 | 2 | 9 | 13 | 64 | 23 | 7 | 1.41 | 48 |
| IICkgj | 72-100 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 50 | 49 | 10 | 1.51 | 44 |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-20 | - | - | - | - | - | 0.14 | 0.2 | 7.9 | 7.4 | 2.4 | 17.8 | 2.1 | - |
| Aegj | 20-29 | - | - | - | - | - | 0.18 | 0.1 | 7.8 | 7.2 | 0.6 | 7.1 | 0.7 | - |
| Btgj | 29-41 | - | - | - | - | - | 0.03 | 0.2 | 7.8 | 7.3 | 0.7 | 19.0 | 0.6 | - |
| Ckgj | 41-72 | - | - | - | - | - | 0.18 | 0.2 | 8.2 | 7.6 | - | - | 36.3 | 1.4 |
| IICkgj | 72-100 | - | - | - | - | - | 0.58 | 0.2 | 8.0 | 7.5 | - | - | 34.4 | 2.8 |

# TAVISTOCK SOIL - TILL PHASE (TVK.T)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 27 | 23 | 2 | 30 | 13 | 49 | 21 | L | 4.1 | 7.1 | 2.2 |
| Bm | 22 | 51 | 3 | 32 | 13 | 46 | 22 | L | 1.6 | 7.2 | 2.6 |
| Btgj | 10 | 61 | 2 | 33 | 16 | 44 | 23 | L | 0.9 | 7.2 | 2.7 |
| IICkgj | 32 | 101 | 3 | 16 | 5 | 48 | 36 | SICL | - | 7.5 | 20.2 |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### TAVISTOCK SOIL - TILL PHASE ONTARIO 1987 PROFILE NO. TPHD011

LOCATION Township of Westminster, Westminster Gore, Lot 22, NTS Map Area 40I/14, 17 TPT 7570 4295

ELEVATION 245 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Nearly level to very gently sloping ground moraine, glaciolacustrine material overlying clayey till

SLOPE 1.0% simple

SOIL WATER REGIME Imperfectly drained, conductivity low, saturation period medium to long

STONINESS Nonstony

CLASSIFICATION Gleyed Gray Brown Luvisol

STATUS Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-18 (18-27) | 10YR3/2m | SIL | weak to moderate, coarse, subangular blocky | weak to moderate, medium, subangular blocky | slightly sticky, soft | |
| Ae | 18-28 (0-12) | 10YR5/3m | SIL | weak to moderate, coarse, subangular blocky | weak to moderate, fine to medium, subangular blocky | slightly sticky, soft | |
| Btgj | 28-44 (14-28) | 7.5YR4/4m | SIL | weak to moderate, coarse, subangular blocky | moderate, medium, subangular blocky | slightly sticky, slightly hard | common,medium, distinct, 7.5YR5/6 |
| Ckgj | 44-51 (5-18) | 10YR5/4m | SIL | weak to moderate, coarse, platy | weak, fine to medium, platy | slightly sticky, soft | common, medium, prominent, 10YR6/8 |
| IICkgj | 51-85 | 10YR5/2m | SIL | moderate to strong, coarse, subangular blocky | weak to moderate, medium, subangular blocky | sticky, hard | common, fine, prominent, 10YR5/6 |

| Horizon | Depth cm | Grav. >2 mm | Sand Fraction % VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-18 | 0 | 0 | 0 | 1 | 3 | 26 | 30 | 55 | 15 | 8 | 1.34 | 46 |
| Ae | 18-28 | 0 | 1 | 1 | 1 | 3 | 25 | 32 | 59 | 9 | 4 | - | - |
| Btgj | 28-44 | 0 | 0 | 0 | 0 | 2 | 27 | 30 | 51 | 19 | 11 | 1.35 | 45 |
| Ckgj | 44-51 | 1 | 1 | 1 | 1 | 5 | 22 | 31 | 60 | 9 | 4 | 1.35 | 51 |
| IICkgj | 51-85 | 6 | 1 | 1 | 4 | 9 | 10 | 25 | 50 | 25 | 6 | 1.52 | 42 |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-18 | 35.7 | 29.5 | 20.6 | 6.1 | 14.5 | 0.17 | 0.3 | 7.3 | 7.1 | 2.8 | 17.9 | 1.1 | - |
| Ae | 18-28 | - | - | - | - | - | - | 0.3 | 7.3 | 7.1 | 0.9 | 14.9 | 0.2 | - |
| Btgj | 28-44 | 31.8 | 26.3 | 20.1 | 8.1 | 12.0 | 0.47 | 0.4 | 7.5 | 7.2 | 0.9 | 17.2 | 0.2 | - |
| Ckgj | 44-51 | 37.4 | 26.8 | 16.9 | 4.6 | 12.3 | 1.08 | 0.2 | 7.9 | 7.5 | - | - | 17.9 | 0.8 |
| IICkgj | 51-85 | 26.3 | 19.6 | 16.2 | 10.2 | 6.0 | - | 0.2 | 8.1 | 7.6 | - | - | 27.1 | 2.1 |

# MAPLEWOOD SOIL (MPW)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 5 | 25 | 0 | 48 | 24 | 31 | 21 | L | 4.20 | 7.10 | 2.20 |
| Bg | 3 | 58 | 0 | 43 | 18 | 30 | 27 | L | 2.10 | 7.20 | 0.40 |
| IICkg | 3 | | 1 | 10 | 4 | 54 | 36 | SICL | - | 7.60 | 28.5 |

# MAPLEWOOD SOIL - TILL PHASE (MPW.T)

Insufficient sampled sites exist in the Middlesex data base to establish a generalized profile description

**ASSOCIATION MEMBERS** Blackwell, poorly drained

**PARENT MATERIALS** Clayey to fine clayey glaciolacustrine deposits

# BLACKWELL SOIL (BCW)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Texture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 3 | 33 | 0 | 7 | 1 | 39 | 53 | SIC | 10.6 | 7.3 | 3.1 |
| Bg | 1 | 66 | 0 | 2 | 0 | 37 | 61 | HC | 4.7 | 7.3 | 0.9 |
| Ckg | 1 | | 0 | 6 | 0 | 57 | 37 | SICL | - | 7.5 | 39.0 |

* This soil is classified as a Rego Humic Gleysol in the Provincial Soil Names File. While this classification may occur in Middlesex, it is not the most common.

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### BLACKWELL SOIL ONTARIO 1987 PROFILE NO. TPHD008

LOCATION Township of McGillivray, Lot 1, Con. XXVIII, NTS Map Area 40P/4, 17 TPT 3735 8712

ELEVATION 180 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Level glaciolacustrine plain, glaciolacustrine clay and heavy clay

SLOPE 0.3% simple

SOIL WATER REGIME Poorly drained, conductivity low, saturation period long

STONINESS Nonstony

CLASSIFICATION Orthic Humic Gleysol

STATUS Taxadjunct to Rego Humic Gleysol

COMMENT Numerous small shells present in the Ckgj2 horizon

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-14 (11-16) | 10YR3/1m | HC | strong, coarse, granular | strong, medium, granular | slightly sticky, loose, plastic | |
| Bg1 | 14-28 (12-17) | 10YR3/1m | HC | strong, very coarse, prismatic | | sticky, very firm, very plastic | |
| Bg2 | 28-47 (12-21) | 10YR4/1m | SIC | strong, very coarse, prismatic | weak, coarse, angular blocky | sticky, very firm, very plastic | |
| Ckg1 | 47-64 (16-20) | 10YR5/1m | SIC | strong, very coarse, prismatic | weak, coarse, angular blocky | sticky, very firm, very plastic | common, medium, prominent, 10YR5/5 |
| Ckg2 | 64-110 | 10YR5/1m | SIC | strong, very coarse, prismatic | | slightly sticky, very firm, very plastic | many, coarse, prominent, 10YR5/6 |

| | | | Sand Fraction % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm$^3$ | Porosity % |
| Ap | 0-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 63 | 16 | .87 | 60 |
| Bg1 | 14-28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 65 | 18 | 1.08 | 56 |
| Bg2 | 28-47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 54 | 21 | 1.14 | 56 |
| Ckg1 | 47-64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 49 | 17 | 1.16 | 55 |
| Ckg2 | 64-110 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 58 | 41 | 14 | 1.05 | 59 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-14 | 58.4 | 42.4 | 37.7 | 21.8 | 15.9 | 10.08 | 0.3 | 7.3 | 7.1 | 7.4 | 44.6 | 0.7 | - |
| Bg1 | 14-28 | 49.5 | 43.3 | 41.1 | 21.4 | 19.7 | 0.11 | 0.3 | 7.5 | 7.1 | 7.5 | 44.9 | 0.9 | - |
| Bg2 | 28-47 | 47.7 | 41.7 | 39.4 | 22.5 | 16.9 | 0.96 | 0.2 | 7.6 | 7.1 | 3.2 | 29.1 | 2.8 | - |
| Ckg1 | 47-64 | 45.6 | 37.9 | 35.5 | 19.1 | 16.4 | 7.24 | 0.3 | 7.7 | 7.3 | - | - | 15.1 | 1.1 |
| Ckg2 | 64-110 | 48.0 | 42.0 | 40.0 | 15.5 | 24.5 | 6.79 | 0.3 | 7.9 | 7.4 | - | - | 31.9 | 2.6 |

**ASSOCIATION MEMBERS** Bookton, well drained
Berrien, imperfectly drained
Wauseon, poorly drained

**PARENT MATERIALS** 40 to 100 cm of sandy textures overlying clayey glaciolacustrine material, or clayey glacial till (till phase)

# BOOKTON SOIL (BOO)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Orthic Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 8 | 23 | 4 | 69 | 18 | 22 | 10 | FSL | 3.8 | 6.7 | 1.4 |
| Bm | 6 | 50 | 5 | 74 | 15 | 18 | 8 | FSL | 0.7 | 7.1 | 1.0 |
| IICk | 8 | | 1 | 9 | 1 | 51 | 41 | SIC | - | 7.6 | 23.2 |

* This soil is classified as a Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# BOOKTON SOIL - TILL PHASE (BOO.T)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Orthic Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 4 | 24 | 2 | 67 | 10 | 20 | 13 | FSL | 3.0 | 6.5 | 2.1 |
| Bm | 2 | 69 | 3 | 83 | 10 | 13 | 5 | LFS | 0.3 | 6.2 | 0.8 |
| Ck | 3 | 72 | 3 | 74 | 3 | 16 | 10 | SL | 0.1 | 7.6 | 29.8 |
| IICk | 4 | | 1 | 22 | 7 | 44 | 35 | CL | - | 7.5 | 22.7 |

* This soil is classified as a Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# BERRIEN SOIL (BRR)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 32 | 24 | 1 | 71 | 21 | 19 | 10 | FSL | 3.8 | 6.9 | 0.9 |
| Bmgj | 33 | 55 | 2 | 76 | 21 | 15 | 9 | FSL | 0.9 | 7.0 | 1.3 |
| Ckgj | 15 | 79 | 6 | 86 | 20 | 9 | 5 | LS | 0.1 | 7.5 | 18.9 |
| IICkgj | 32 | | 1 | 8 | 2 | 52 | 39 | SICL | - | 7.6 | 24.0 |

* This soil is classified as a Gleyed Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### BERRIEN SOIL ONTARIO 1987 PROFILE NO. TPHD004

LOCATION Township of Ekfrid, Lot 8, Range I South, NTS Map Area 40I/13, 17 TPT 5175 3667

ELEVATION 220 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Very gently sloping eolian knoll, eolian sandy material overlying clayey glaciolacustrine material

SLOPE 3.0% complex

SOIL WATER REGIME Well drained, conductivity medium to low, saturation period medium

STONINESS Nonstony

CLASSIFICATION Gleyed Melanic Brunisol

STATUS Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-26 (23-28) | 10YR3/2m | FSL | weak, coarse, subangular blocky | | nonsticky, firm, slightly plastic | |
| Bmgj | 26-45 (19-21) | 10YR6/6m | LFS | single grain | | nonsticky, loose, nonplastic | common, fine, distinct, 7.5YR4/6 |
| Ckgj | 45-60 (11-20) | 10YR5/4m | FS | single grain | | nonsticky, loose, nonplastic | common, medium, prominent, 10YR5/8 |
| IICkgj | 60-110 | 10YR5/2m | SIC | weak, very coarse, subangular blocky | weak, coarse, subangular blocky | sticky, very friable very plastic | common, medium, prominent, 10YR5/6 |

| Horizon | Depth cm | Grav. <2 mm | Sand Fraction % VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-26 | 0 | 0 | 0 | 4 | 51 | 20 | 74 | 15 | 10 | 4 | 1.27 | 48 |
| Bmgj | 26-45 | 0 | 0 | 0 | 2 | 63 | 18 | 83 | 6 | 11 | 7 | 1.43 | 45 |
| Ckgj | 45-60 | 3 | 3 | 1 | 4 | 51 | 29 | 88 | 7 | 5 | 3 | 1.45 | 48 |
| IICkgj | 60-110 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 54 | 44 | 10 | 1.44 | 45 |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-26 | 39.0 | 30.3 | 19.3 | 6.9 | 12.4 | 1.33 | 0.3 | 7.7 | 7.3 | 4.8 | 18.9 | 1.1 | - |
| Bmgj | 26-45 | 27.3 | 18.4 | 7.4 | 2.4 | 5.0 | 2.34 | 0.2 | 7.6 | 7.1 | 0.4 | 13.3 | 0.6 | - |
| Ckgj | 45-60 | 28.9 | 19.0 | 3.6 | 1.3 | 2.3 | 1.94 | 0.1 | 8.2 | 7.5 | - | - | 17.2 | 1.7 |
| IICkgj | 60-110 | 25.4 | 21.7 | 19.9 | 13.4 | 6.5 | 0.04 | 0.2 | 8.0 | 7.5 | - | - | 27.4 | 5.5 |

# BERRIEN SOIL - TILL PHASE (BRR.T)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 26 | 28 | 1 | 69 | 20 | 19 | 11 | FSL | 3.9 | 7.1 | 0.9 |
| Bmgj | 23 | 58 | 2 | 76 | 21 | 16 | 8 | FSL | 1.0 | 7.0 | 1.4 |
| Ckgj | 9 | 78 | 2 | 34 | 9 | 33 | 34 | SICL | 0.6 | 7.5 | 4.9 |
| IICkgj | 23 | | 2 | 18 | 5 | 47 | 35 | SICL | - | 7.6 | 23.9 |

* This soil is classified as a Gleyed Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# WAUSEON SOIL (WUS)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 7 | 25 | 0 | 83 | 18 | 21 | 16 | FSL | 5.7 | 7.1 | 1.8 |
| Bg | 4 | 46 | 2 | 70 | 24 | 17 | 14 | FSL | 1.2 | 7.3 | 1.8 |
| Ckg | 4 | 66 | 5 | 81 | 14 | 15 | 5 | LFS | - | 7.6 | 24.5 |
| IICkg | 8 | | 1 | 11 | 5 | 50 | 39 | SICL | - | 7.6 | 25.0 |

# WAUSEON SOIL - TILL PHASE (WUS.T)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 3 | 26 | 4 | 61 | 17 | 22 | 17 | FSL | 4.7 | 7.3 | 6.7 |
| Bg | 2 | 59 | 1 | 87 | 22 | 9 | 6 | LS | 0.8 | 6.9 | 0.4 |
| Ckg | 5 | 69 | 7 | 80 | 11 | 12 | 8 | LS | - | 7.5 | 21.1 |
| IICkg | 4 | | 4 | 15 | 4 | 46 | 39 | SICL | - | 7.6 | 27.6 |

**ASSOCIATION MEMBERS** Brant, well drained
Tuscola, imperfectly drained
Colwood, poorly drained

**PARENT MATERIALS** Glaciolacustrine loam, silt loam and very fine sandy loam

# BRANT SOIL (BRT)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Orthic Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 15 | 28 | 1 | 29 | 15 | 53 | 18 | SIL | 3.8 | 7.1 | 1.4 |
| Bm1 | 5 | 61 | 1 | 35 | 20 | 51 | 14 | SIL | 0.9 | 6.7 | 1.4 |
| Bm2 | 12 | 84 | 0 | 26 | 14 | 59 | 16 | SIL | 0.8 | 6.9 | 1.7 |
| Ck | 12 | | 3 | 29 | 15 | 55 | 17 | SIL | - | 7.6 | 23.2 |

* This soil is classified as a Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# TUSCOLA SOIL (TUC)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 106 | 28 | 1 | 34 | 18 | 48 | 18 | L | 4.5 | 7.2 | 2.5 |
| Bmgj | 61 | 64 | 1 | 38 | 23 | 46 | 16 | L | 1.5 | 7.0 | 0.8 |
| Ckgj | 86 | | 1 | 28 | 16 | 57 | 15 | SIL | - | 7.6 | 26.6 |

* This soils is classified as a Gleyed Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## TUSCOLA SOIL ONTARIO 1987 PROFILE NO. TPHD014

| | |
|---|---|
| LOCATION | Township of West Williams, Lot 20, Con. XVII, NTS Map Area 40P/4, 17 TPT 3775 7730 |
| ELEVATION | 205 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Level to rolling glaciolacustrine plain, very fine sandy loam and silt loam textures |
| SLOPE | 1.5% simple |
| SOIL WATER REGIME | Imperfectly drained, moderately slow conductivity, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Melanic Brunisol |
| STATUS | Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-18 (16-20) | 10YR3/3m | VFSL | moderate, coarse, granular | moderate, medium, granular | slightly sticky, very firm, plastic | |
| Bmgj1 | 18-31 (11-16) | 10YR4/3m | VFSL | moderate, coarse, platy | weak, medium, platy | slightly sticky, friable, plastic | common, fine, prominent, 10YR5/6 |
| Bmgj2 | 31-49 (3-19) | 2.5Y5/4m | VFSL | weak, coarse, platy | weak, medium, platy | slightly sticky, friable, plastic | common, medium, distinct, 10YR5/6 |
| Ckgj | 49-110 | 2.5Y5/4m | SIL | weak, coarse, subangular blocky | weak, medium, subangular blocky | slightly sticky, friable, platy | many, medium, distinct, 10YR5/6 |

| | | Sand Fraction % | | | | | | | | | Fine | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Clay <2μm % | Bulk Density g/cm³ | Porosity % |
| Ap | 0-18 | 0 | 0 | 0 | 1 | 11 | 45 | 57 | 32 | 11 | 5 | 1.36 | 51 |
| Bmgj1 | 18-31 | 0 | 0 | 0 | 0 | 6 | 49 | 55 | 35 | 10 | 5 | 1.44 | 49 |
| Bmgj2 | 31-49 | 0 | 0 | 0 | 0 | 6 | 46 | 53 | 38 | 9 | 4 | 1.47 | 45 |
| Ckgj | 49-110 | 0 | 0 | 1 | 0 | 3 | 30 | 34 | 58 | 7 | 3 | 1.59 | 41 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-18 | 27.5 | 23.2 | 17.9 | 5.3 | 12.6 | 0.08 | 0.2 | 7.9 | 7.5 | 3.2 | 15.3 | 2.7 | - |
| Bmgj1 | 18-31 | 28.8 | 23.6 | 19.7 | 6.7 | 13.0 | 0.61 | 0.2 | 7.9 | 7.4 | 0.7 | 13.0 | 4.9 | - |
| Bmgj2 | 31-49 | 26.6 | 21.0 | 16.0 | 5.3 | 10.7 | 0.73 | 0.3 | 8.0 | 7.5 | 0.3 | 14.3 | 17.4 | - |
| Ckgj | 49-110 | 23.1 | 18.2 | 14.1 | 3.6 | 10.5 | 0.68 | 0.2 | 8.2 | 7.6 | - | - | 40.6 | 0.6 |

# COLWOOD SOIL (CWO)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 25 | 25 | 1 | 38 | 20 | 43 | 19 | L | 6.60 | 7.20 | 1.50 |
| Bg | 26 | 74 | 0 | 28 | 16 | 50 | 22 | L | 1.30 | 7.10 | 2.60 |
| Ckg | 32 | | 1 | 25 | 14 | 57 | 18 | SIL | - | 7.50 | 23.2 |

# BRANTFORD ASSOCIATION

ASSOCIATION MEMBERS Brantford, moderately well drained
Beverly, imperfectly drained
Toledo, poorly drained

PARENT MATERIALS Clayey glaciolacustrine deposits

## BRANTFORD SOIL (BFO)

### GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 25 | 22 | 1 | 14 | 5 | 55 | 31 | SICL | 4.7 | 7.0 | 1.2 |
| Bm | 5 | 47 | 2 | 15 | 2 | 45 | 40 | SICL | 1.2 | 7.3 | 3.2 |
| Bt | 16 | 57 | 0 | 5 | 0 | 50 | 44 | SIC | 1.1 | 7.1 | 0.6 |
| Ck | 21 | | 0 | 6 | 1 | 54 | 40 | SICL | - | 7.5 | 18.4 |

## BEVERLY SOIL (BVY)

### GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 135 | 22 | 1 | 17 | 6 | 50 | 32 | SICL | 4.40 | 7.0 | 1.3 |
| Btgj | 71 | 49 | 0 | 9 | 2 | 47 | 44 | SIC | 1.2 | 7.2 | 2.0 |
| Bmgj | 70 | 56 | 0 | 14 | 5 | 50 | 37 | SICL | 1.1 | 7.2 | 2.2 |
| Ckgj | 134 | | 0 | 6 | 1 | 54 | 41 | SIC | - | 7.6 | 23.0 |

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## BEVERLY SOIL ONTARIO 1987 PROFILE NO. TPHD007

| | |
|---|---|
| LOCATION | Township of Mosa, Lot 3, Con. III, NTS Map Area 40I/13, 17 TPT 3925 3365 |
| ELEVATION | 220 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Nearly level clay plain, glaciolacustrine clayey material |
| SLOPE | 2.0% simple |
| SOIL WATER REGIME | Imperfectly drained, conductivity low, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Gray Brown Luvisol |
| STATUS | Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-22 (21-25) | 10YR3/2m | SICL | strong, medium to coarse, subangular blocky | strong, fine to medium, subangular blocky | very sticky firm, very plastic | |
| Bmgj | 22-35 (8-14) | 10YR4/3m | SIC | strong, coarse, subangular blocky | strong, medium to coarse, subangular blocky | sticky, firm, very plastic | many, fine, prominent, 7.5YR5/6 |
| Btgj | 35-54 (10-24) | 10YR3/3m | SIC | strong, very coarse, subangular blocky | strong, medium to coarse, subangular blocky | slightly sticky, firm, very plastic | common, fine, prominent, 10YR5/6 |
| Ckg | 54-105 | 10YR5/2m | SIC | strong, coarse, subangular blocky | strong, fine to medium, subangular blocky | slightly sticky, very firm, very plastic | common, fine, prominent, 10YR5/6 |

| | | | Sand Fraction % | | | | | | | | Fine | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Clay <2μm % | Bulk Density g/cm³ | Porosity % |
| Ap | 0-22 | 0 | 0 | 1 | 2 | 3 | 3 | 10 | 52 | 38 | 13 | 1.01 | 56 |
| Bmgj | 22-35 | 0 | 1 | 1 | 1 | 3 | 2 | 10 | 47 | 43 | 17 | 1.39 | 42 |
| Btgj | 35-54 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 44 | 49 | 19 | 1.37 | 40 |
| Ckg | 54-105 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 49 | 48 | 14 | 1.42 | 35 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-22 | 51.6 | 37.5 | 33.0 | 11.2 | 21.8 | 21.48 | 0.3 | 7.6T7.1 | 6.2 | 28.4 | 1.2 | - | |
| Bmgj | 22-35 | 32.3 | 27.6 | 25.4 | 15.7 | 9.7 | 0.17 | 0.2 | 7.7 | 7.2 | 1.4 | 28.4 | 0.5 | - |
| Btgj | 35-54 | 33.0 | 28.5 | 26.2 | 17.6 | 8.6 | 0.06 | 0.2 | 7.8 | 7.3 | 0.9 | 24.5 | 0.7 | - |
| Ckg | 54-105 | 30.0 | 24.7 | 22.0 | 15.8 | 6.2 | 0.04 | 0.2 | 8.0 | 7.6 | 0.0 | - | 21.9 | 2.6 |

# TOLEDO SOIL (TLD)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 55 | 23 | 0 | 17 | 7 | 46 | 37 | SICL | 5.4 | 7.1 | 1.4 |
| Bg1 | 18 | 63 | 0 | 14 | 6 | 46 | 40 | SICL | 1.9 | 7.0 | 1.2 |
| Bg2 | 18 | 92 | 0 | 12 | 5 | 47 | 41 | SIC | 1.1 | 7.1 | 2.5 |
| Ckg | 47 | | 0 | 9 | 2 | 50 | 41 | SIC | - | 7.5 | 19.4 |

**ASSOCIATION MEMBERS** Bryanston, well drained
Thorndale, imperfectly drained
Nissouri, poorly drained

**PARENT MATERIALS** Loamy glacial till

# BRYANSTON SOIL (BRY)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol**

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 5 | 21 | 3 | 26 | 10 | 51 | 23 | SIL | 4.0 | 7.2 | 8.0 |
| Bm | 1 | 52 | 1 | 19 | 12 | 58 | 23 | SIL | 1.0 | 7.2 | 4.0 |
| Ck | 5 | | 10 | 27 | 9 | 47 | 27 | L | - | 7.6 | 24.2 |

** Horizon sequence in the generalized profile is based on a small number of sampled sites and is not consistent with the usual classification of a Bryanston soil

# THORNDALE SOIL (THN)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 49 | 26 | 2 | 24 | 10 | 53 | 22 | SIL | 4.3 | 7.3 | 1.7 |
| Bmgj | 18 | 53 | 2 | 23 | 9 | 53 | 24 | SIL | 1.1 | 7.3 | 0.9 |
| Btgj | 7 | 58 | 3 | 29 | 11 | 42 | 29 | CL | 1.0 | 7.3 | 0.9 |
| Ckgj | 63 | | 8 | 29 | 10 | 49 | 23 | L | - | 7.6 | 23.8 |

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## THORNDALE SOIL ONTARIO 1987 PROFILE NO. TPHD016

| | |
|---|---|
| LOCATION | Township of West Nissouri, Lot 21, Con. V, NTS Map Area 40P/3, 17 TPT 8975 7670 |
| ELEVATION | 320 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Nearly level to very gently sloping ground moraine, loamy glacial till |
| SLOPE | 1.0% simple |
| SOIL WATER REGIME | Imperfectly drained, conductivity medium, saturation period medium to long |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Brunisolic Gray Brown Luvisol |
| STATUS | Typical |
| COMMENT | Large cobbles present in the Ckgj horizon |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-21 (18-28) | 10YR3/2m | SIL | moderate, medium, subangular blocky | moderate, fine, subangular blocky | slightly sticky, very firm, plastic | |
| Bmgj | 21-37 (10-23) | 10YR5/3m | SIL | moderate, medium, subangular blocky | moderate, fine, subangular blocky | slightly sticky, very firm, plastic | common, fine, prominent, 7.5YR5/6 |
| Bt | 37-47 (8-16) | 7.5YR4/2m | L | moderate to strong, medium, subangular blocky | moderate to strong, fine to medium, subangular blocky | sticky, firm, very plastic | |
| Ckgj | 47-100 | 10YR5/3m | L | strong, medium, subangular blocky | strong, fine to medium, subangular blocky | slightly sticky, hard, plastic | common, medium, prominent, 10YR5/3 |

| Horizon | Depth cm | Grav. >2 mm | Sand Fraction % VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-21 | 3 | 1 | 3 | 5 | 7 | 7 | 24 | 58 | 18 | 6 | .97 | 56 |
| Bmgj | 21-37 | 3 | 1 | 3 | 4 | 8 | 8 | 24 | 62 | 14 | 4 | 1.28 | 46 |
| Bt | 37-47 | 18 | 2 | 3 | 5 | 12 | 9 | 31 | 46 | 23 | 7 | 1.34 | 41 |
| Ckgj | 47-100 | 13 | 3 | 3 | 6 | 12 | 9 | 33 | 49 | 18 | 5 | 1.50 | 43 |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-21 | 53.7 | 39.0 | 28.9 | 9.6 | 19.3 | 17.93 | 0.5 | 7.0 | 6.7 | 6.7 | 26.1 | - | - |
| Bmgj | 21-37 | 37.1 | 30.2 | 25.8 | 7.7 | 18.1 | 9.95 | 0.1 | 6.6 | 6.0 | 1.0 | 12.3 | - | - |
| Bt | 37-47 | 30.6 | 23.2 | 19.8 | 10.6 | 9.2 | - | 0.2 | 7.7 | 7.2 | 0.7 | 23.5 | 13.0 | - |
| Ckgj | 47-100 | 29.8 | 21.7 | 17.8 | 10.1 | 7.7 | - | 0.1 | 8.1 | 7.5 | - | - | 34.7 | 1.5 |

# NISSOURI SOIL (NIS)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 8 | 28 | 1 | 22 | 8 | 52 | 26 | SIL | 4.8 | 7.3 | 1.8 |
| Bg | 2 | 61 | 3 | 31 | 7 | 43 | 27 | L | 1.5 | 7.0 | 1.0 |
| Ckg | 9 | | 11 | 31 | 8 | 45 | 23 | L | - | 7.5 | 24.4 |

# BURFORD ASSOCIATION

ASSOCIATION MEMBERS Burford, rapidly drained
Brisbane, imperfectly drained
Gilford, poorly drained

PARENT MATERIALS Gravelly and/or cobbly glaciofluvial material

# BURFORD SOIL (BUF)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Rapid

USUAL CLASSIFICATION Orthic Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 10 | 20 | 14 | 57 | 8 | 30 | 14 | SL | 3.2 | 7.1 | 7.0 |
| Bm | 2 | 38 | 17 | 81 | 9 | 13 | 6 | LCS | 1.1 | 7.1 | 11.6 |
| Ck | 10 | | 37 | 71 | 6 | 19 | 10 | GCSL | - | 7.5 | 33.5 |

* This soil is classified as an Orthic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### BURFORD SOIL ONTARIO 1987 PROFILE NO. TPHD009

LOCATION Township of London, Lot 5, Con. VI, NTS Map Area 40P/3, 17 TPT 8340 6700

ELEVATION 265 metres

SITE Idle

LANDFORM AND PARENT MATERIALS Gently to moderately sloping glaciofluvial outwash terrace

SLOPE 8.0% simple

SOIL WATER REGIME Rapidly drained, conductivity high, saturation period very short

STONINESS Nonstony

CLASSIFICATION Orthic Melanic Brunisol

STATUS Taxadjunct to Orthic Gray Brown Luvisol

COMMENT Many cobbles and stones present in Ck horizon

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-18 (16-19) | 10YR3/3m | L | strong, medium, granular | strong, fine, granular | slightly sticky, very firm, nonplastic | |
| Bmk | 18-43 (15-36) | 7.5YR5/3m | GCSL | single grain | | nonsticky, very firm, nonplastic | |
| Ck | 43-105 | 10YR5/3m | VGCS | single grain | | nonsticky, loose, nonplastic | |

| | | | Sand Fraction % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm$^3$ | Porosity % |
| Ap | 0-18 | 15 | 3 | 5 | 9 | 15 | 7 | 39 | 43 | 18 | 9 | .94 | 61 |
| Bmk | 18-43 | 48 | 13 | 31 | 14 | 8 | 4 | 71 | 15 | 14 | 9 | - | - |
| Ck | 43-105 | 52 | 12 | 49 | 27 | 2 | 1 | 92 | 6 | 2 | 1 | - | - |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-18 | 71.3 | 48.7 | 32.5 | 10.6 | 21.9 | 11.76 | 0.3 | 7.7 | 7.1 | 5.5 | 21.8 | 2.2 | - |
| Bmk | 18-43 | - | - | - | - | - | - | 0.2 | 7.9 | 7.3 | 1.3 | 16.9 | 33.4 | - |
| Ck | 43-105 | - | - | - | - | - | - | 0.1 | 8.2 | 7.4 | - | - | 54.4 | 2.3 |

## BRISBANE SOIL (BSB)

Insufficient sampled sites exist in the Middlesex data base to establish a generalized profile description

## GILFORD SOIL (GFD)

Insufficient sampled sites exist in the Middlesex data base to establish a generalized profile description.

# CALEDON ASSOCIATION

**ASSOCIATION MEMBERS** Caledon, rapidly to well drained
Camilla, imperfectly drained
Ayr, poorly drained

**PARENT MATERIALS** Sandy textures overlying gravelly and cobbly glaciofluvial outwash

# CALEDON SOIL (CAD)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Rapid to well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 17 | 24 | 6 | 71 | 11 | 20 | 8 | SL | 3.0 | 7.0 | 2.4 |
| Bm | 13 | 52 | 5 | 79 | 11 | 14 | 6 | LS | 1.0 | 7.0 | 0.4 |
| Bt | 6 | 69 | 8 | 68 | 8 | 14 | 18 | SL | 0.7 | 7.2 | 3.9 |
| IICk | 15 | | 28 | 81 | 7 | 12 | 7 | GLS | - | 7.5 | 24.9 |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### CALEDON SOIL ONTARIO 1987 PROFILE NO. TPHD012

LOCATION Township of Delaware, Lot 11, Con. D, NTS Map Area 40I/14, 17 TPT 6620 4690

ELEVATION 220 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Nearly level to very gently sloping glaciofluvial terrace, sands over gravelly outwash material

SLOPE 1.5% simple

SOIL WATER REGIME Rapidly drained, conductivity high, saturation period short

STONINESS Nonstony

CLASSIFICATION Brunisolic Gray Brown Luvisol

STATUS Typical

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-25 (22-29) | 10YR3/2m | LS | single grain | | nonsticky, loose, nonplastic | |
| Bm1 | 25-38 (13-19) | 7.5YR4/2m | LS | single grain | | nonsticky, loose, nonplastic | |
| Bm2 | 38-72 (5-34) | 7.5YR4/4m | GLCS | single grain | | nonsticky, loose, nonplastic | |
| Bt | 72-84 (8-15) | 5.0YR3/2m | CS | single grain | | nonsticky, loose, nonplastic | |
| IICk | 84-110 | 10YR5/3m | GCS | single grain | | nonsticky, loose, nonplastic | |

| | | | Sand Fraction % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm$^3$ | Porosity % |
| Ap | 0-25 | 8 | 4 | 13 | 35 | 17 | 10 | 80 | 14 | 7 | 4 | 1.27 | 47 |
| Bm1 | 25-38 | 14 | 5 | 19 | 49 | 10 | 3 | 87 | 8 | 6 | 3 | 1.35 | 52 |
| Bm2 | 38-72 | 21 | 8 | 20 | 43 | 11 | 3 | 86 | 8 | 6 | 3 | 1.30 | 46 |
| Bt | 72-84 | 18 | 9 | 24 | 41 | 10 | 3 | 87 | 8 | 5 | 3 | 1.22 | 55 |
| IICk | 84-110 | 40 | 19 | 28 | 33 | 8 | 2 | 91 | 6 | 2 | 2 | 1.36 | 50 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-25 | 28.5 | 19.5 | 12.2 | 3.7 | 8.5 | 13.56 | 0.2 | 7.5 | 6.9 | 2.2 | 14.0 | - | - |
| Bm1 | 25-38 | 26.3 | 16.9 | 10.8 | 2.9 | 7.9 | 14.64 | 0.1 | 7.7 | 7.1 | 0.4 | 11.3 | 0.4 | - |
| Bm2 | 38-72 | 26.8 | 10.2 | 6.5 | 2.2 | 4.3 | 14.04 | 0.1 | 7.9 | 7.3 | 0.4 | 12.0 | 3.6 | - |
| Bt | 72-84 | 25.7 | 8.8 | 5.7 | 1.7 | 4.0 | 16.32 | 0.1 | 7.9 | 7.3 | 0.5 | 13.3 | 6.9 | - |
| IICk | 84-110 | 25.1 | 6.7 | 4.1 | 1.0 | 3.1 | 25.08 | 0.1 | 8.1 | 7.5 | - | - | 34.9 | 1.2 |

# CAMILLA SOIL (CML)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 10 | 23 | 4 | 65 | 12 | 23 | 12 | SL | 3.3 | 7.1 | 2.3 |
| Bmgj | 7 | 52 | 4 | 69 | 10 | 23 | 9 | SL | 0.9 | 7.0 | 0.7 |
| Btgj | 2 | 56 | 11 | 64 | 8 | 20 | 16 | CSL | 0.9 | 7.3 | 2.1 |
| IICkgj | 6 | | 22 | 82 | 12 | 12 | 6 | GLS | - | 7.5 | 18.0 |

# AYR SOIL (AYR)

Insufficient sampled sites exist in the Middlesex data base to establish a generalized profile description

# FOX ASSOCIATION

**ASSOCIATION MEMBERS** Fox, rapidly drained
Brady, imperfectly drained
Granby, poorly drained

**PARENT MATERIALS** Glaciolacustrine and glaciofluvial sand and loamy sand, occasionally with layers of sandy loam material

# FOX SOIL (FOX)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Rapid

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 12 | 23 | 3 | 77 | 8 | 16 | 7 | LS | 3.1 | 7.0 | 2.6 |
| Bm | 13 | 41 | 4 | 84 | 5 | 11 | 5 | LS | 0.8 | 6.9 | 0.5 |
| Bt | 4 | 62 | 8 | 74 | 6 | 14 | 13 | SL | 0.5 | 6.6 | 1.1 |
| Ck | 9 | | 4 | 89 | 7 | 7 | 4 | S | - | 7.4 | 24.4 |

# BRADY SOIL (BAY)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 7 | 28 | 3 | 71 | 12 | 20 | 10 | SL | 3.4 | 6.8 | 1.2 |
| Bmgj | 4 | 48 | 5 | 77 | 13 | 16 | 7 | LS | 0.9 | 6.9 | 0.5 |
| Btgj | 4 | 66 | 3 | 71 | 14 | 20 | 10 | SL | 1.4 | 7.1 | 2.6 |
| Ckgj | 7 | | 7 | 85 | 6 | 11 | 4 | LS | - | 7.5 | 19.2 |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### BRADY ONTARIO 1987 PROFILE NO. TPHD018

| | |
|---|---|
| LOCATION | Township of Mosa, Range II South, Lot 8, NTS Map Area 40I/12, 17 TPT 4357 2527 |
| ELEVATION | 198 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Nearly level to very gently sloping glaciofluvial sandy terrace of Thames River Valley |
| SLOPE | 1.5% simple |
| SOIL WATER REGIME | Imperfectly drained, conductivity medium to high, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Gray Brown Luvisol |
| STATUS | Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol. Depth to carbonates is shallower than normal. |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-18 (18-23) | 10YR3/2m | SL | weak, coarse, angular blocky | weak, medium, angular blocky | very firm, nonsticky, nonplastic | |
| Bt | 18-31 (10-26) | 7.5YR4/4m | SL | weak, coarse, angular blocky | weak, medium, angular blocky | very firm, slightly sticky, slightly plastic | |
| Ckgj | 31-50 (4-27) | 10YR4/3m | LS | single grain | single grain | loose, nonsticky, nonplastic | common, fine, prominent, 10YR5/8 |
| Ck | 50-100 | 10YR5/2m | S | single grain | single grain | loose, nonsticky, nonplastic | |

| Horizon | Depth cm | Grav. >2 mm | Sand Fraction % VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-18 | 8 | 4 | 18 | 45 | 6 | 4 | 77 | 14 | 8 | 4 | 1.43 | 44 |
| Bt | 18-31 | 11 | 4 | 13 | 49 | 6 | 3 | 74 | 8 | 18 | 10 | 1.50 | 42 |
| Ckgj | 31-50 | 17 | 7 | 16 | 44 | 9 | 6 | 80 | 11 | 9 | 5 | 1.42 | 46 |
| Ck | 50-100 | 2 | 0 | 2 | 73 | 22 | 1 | 98 | 2 | 0 | 1 | 1.37 | 48 |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-18 | 24.1 | 17.2 | 13.4 | 9.9 | 3.5 | 0.26 | 0.1 | 6.7 | 6.1 | 2.6 | 8.3 | - | - |
| Bt | 18-31 | 24.6 | 16.2 | 12.4 | 10.4 | 2.0 | 2.04 | 0.2 | 7.3 | 6.8 | 0.9 | 9.3 | - | - |
| Ckgj | 31-50 | 20.4 | 11.1 | 7.7 | 3.7 | 4.0 | 11.64 | 0.2 | 7.8 | 7.4 | - | - | 13.3 | 0.9 |
| Ck | 50-100 | 27.5 | 5.3 | 2.7 | 1.4 | 1.3 | 18.60 | 0.1 | 8.2 | 7.6 | - | - | 27.5 | 1.2 |

## GRANBY SOIL (GNY)

Insufficient sampled sites exist in the Middlesex data base to establish a generalized profile description

# HONEYWOOD ASSOCIATION

ASSOCIATION MEMBERS Honeywood, well drained
Embro, imperfectly drained
Crombie, poorly drained

PARENT MATERIALS 40 to 100 cm of loamy glaciolacustrine material overlying loamy glacial till

# HONEYWOOD SOIL (HYW)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Orthic Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Texture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 6 | 23 | 1 | 22 | 13 | 61 | 18 | SIL | 5.4 | 7.3 | 2.2 |
| Bm | 8 | 59 | 1 | 20 | 12 | 62 | 18 | SIL | 2.5 | 7.3 | 1.4 |
| IICk | 8 | | 10 | 36 | 13 | 48 | 17 | L | - | 7.6 | 23.1 |

* This soil is classified as a Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# EMBRO SOIL (EBR)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Texture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 33 | 25 | 1 | 24 | 12 | 56 | 20 | SIL | 4.4 | 7.2 | 1.3 |
| Bmgj | 31 | 62 | 1 | 26 | 14 | 55 | 19 | SIL | 1.0 | 7.2 | 1.1 |
| IICkgj | 38 | | 9 | 35 | 10 | 46 | 19 | L | - | 7.6 | 25.2 |

* This soil is classified as a Gleyed Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## EMBRO SOIL ONTARIO 1987 PROFILE NO. TPHD015

| | |
|---|---|
| LOCATION | Township of London, Lot 8, Con. VII, NTS Map Area 40P/3, 17 TPT 8050 6945 |
| ELEVATION | 280 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Nearly level to very gently sloping ground moraine, loamy glaciolacustrine deposits overlying loamy glacial till |
| SLOPE | 1.0% simple |
| SOIL WATER REGIME | Imperfectly drained, conductivity medium, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Melanic Brunisol |
| STATUS | Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-30 (23-34) | 10YR3/2m | SIL | moderate, coarse, subangular blocky | moderate, fine to medium, subangular blocky | slightly sticky, very firm, slightly plastic | |
| Bmgj | 30-63 (30-36) | 10YR5/3m | SIL | moderate, medium, subangular blocky | moderate, fine to medium, subangular blocky | slightly sticky, firm, slightly plastic | common, fine, prominent, 10YR5/6 |
| IIBmgj | 63-78 (15-17) | 10YR5/3m | SIL | moderate to strong, medium, subangular blocky | moderate, fine to medium, subangular blocky | slightly sticky, firm, slightly plastic | common, fine, prominent, 10YR5/6 |
| IICkgj | 78-110 | 7.5YR5/2m | L | moderate to strong, medium to coarse, subangular blocky | moderate to strong, medium, subangular blocky | slightly sticky, firm, plastic | common, fine, prominent, 10YR5/6 |

| | | | Sand Fraction % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm$^3$ | Porosity % |
| Ap | 0-30 | 1 | 0 | 2 | 5 | 6 | 7 | 21 | 58 | 21 | 9 | 1.32 | 43 |
| Bmgj | 30-63 | 2 | 1 | 2 | 6 | 7 | 7 | 23 | 59 | 18 | 8 | 1.46 | 40 |
| IIBmgj | 63-78 | 4 | 0 | 2 | 8 | 8 | 10 | 29 | 55 | 15 | 7 | 1.42 | 47 |
| IICkgj | 78-110 | 8 | 1 | 3 | 5 | 12 | 9 | 31 | 45 | 24 | 8 | - | - |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-30 | 37.6 | 30.6 | 26.4 | 10.0 | 16.4 | 6.66 | 0.3 | 7.5 | 7.4 | 4.4 | 37.6 | 0.5 | - |
| Bmgj | 30-63 | 25.4 | 21.3 | 19.0 | 8.4 | 10.6 | 2.12 | 0.2 | 7.5 | 7.2 | 1.0 | 15.3 | 0.4 | - |
| IIBmgj | 63-78 | 25.7 | 21.2 | 18.2 | 7.2 | 11.0 | 5.36 | 0.1 | 7.6 | 7.3 | 0.5 | 13.6 | 0.8 | - |
| IICkgj | 78-110 | - | - | - | - | - | - | 0.2 | 7.7 | 7.2 | - | - | 1.4 | 0.7 |

# CROMBIE SOIL (CMB)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 2 | 29 | 1 | 18 | 9 | 57 | 26 | SIL | 5.5 | 7.1 | 1.0 |
| Bg | 3 | 60 | 1 | 25 | 12 | 57 | 18 | SIL | 1.4 | 7.1 | 1.3 |
| IICkg | 4 | | 8 | 33 | 11 | 47 | 20 | SIL | - | 7.6 | 23.6 |

**ASSOCIATION MEMBERS** Huron, moderately well drained
Perth, imperfectly drained
Brookston, poorly drained

**PARENT MATERIALS** Clayey glacial till material

# HURON SOIL (HUO)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Moderately well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 9 | 25 | 2 | 22 | 11 | 52 | 25 | SIL | 4.8 | 7.2 | 2.2 |
| Bm | 3 | 35 | 0 | 16 | 8 | 52 | 32 | SICL | 1.5 | 7.3 | 1.0 |
| Bt | 3 | 50 | 2 | 14 | 7 | 47 | 39 | SICL | 1.4 | 7.2 | 1.3 |
| Ck | 9 | | 7 | 19 | 6 | 44 | 37 | SICL | - | 7.5 | 18.9 |

# PERTH SOIL (PTH)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 99 | 25 | 2 | 20 | 8 | 49 | 31 | SICL | 4.4 | 7.3 | 3.3 |
| Bmgj | 15 | 44 | 2 | 25 | 8 | 41 | 35 | CL | 1.4 | 7.2 | 1.3 |
| Btgj | 28 | 50 | 1 | 18 | 6 | 41 | 42 | SIC | 1.2 | 7.2 | 1.2 |
| Ckgj | 107 | | 5 | 15 | 4 | 47 | 37 | SICL | - | 7.6 | 25.8 |

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## PERTH SOIL ONTARIO 1987 PROFILE NO. TPHD017

| | |
|---|---|
| LOCATION | Township of McGillivary, Lot 16, Con. II, NTS Map Area 40P/3, 17 TPT 6167 8440 |
| ELEVATION | 259 metres |
| SITE | Row crops |
| LANDFORM AND PARENT MATERIALS | Nearly level to very gently rolling ground moraine, clayey glacial till |
| SLOPE | 1.0% simple |
| SOIL WATER REGIME | Imperfectly drained, conductivity low, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Brunisolic Gray Brown Luvisol |
| STATUS | Typical |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-19 (19-29) | 10YR3/2m | SICL | moderate, coarse, subangular blocky | moderate, medium, subangular blocky | friable, sticky very plastic | |
| Bmgj | 19-31 (5-14) | 10YR5/4m | SICL | moderate, medium subangular blocky | moderate, medium, subangular blocky | friable, sticky, very plastic | common, fine, distinct, 10YR5/6 |
| Btgj | 31-45 (7-15) | 7.5YR4/2m | SICL | moderate, medium, subangular blocky | moderate, fine, subangular blocky | friable, sticky, very plastic | few, fine, distinct, 7.5YR4/4 |
| Ckgj | 45-85 | 10YR5/2m | SICL | strong, medium, subangular blocky | strong, fine, subangular blocky | firm, sticky, very plastic | common, medium, prominent, 10YR5/6 |

| | | Sand Fraction % | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2μm % | Bulk Density g/cm³ | Porosity % |
| Ap | 0-19 | 1 | 2 | 2 | 3 | 3 | 5 | 14 | 52 | 34 | 15 | 1.22 | 51 |
| Bmgj | 19-31 | 3 | 2 | 2 | 3 | 4 | 5 | 16 | 50 | 34 | 18 | 1.16 | 55 |
| Btjgj | 31-45 | 14 | 4 | 4 | 6 | 5 | 4 | 23 | 38 | 39 | 16 | 1.23 | 53 |
| Ckgj | 45-85 | 9 | 4 | 2 | 1 | 2 | 2 | 11 | 46 | 44 | 11 | 1.47 | 44 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-19 | 36.0 | 33.1 | 29.7 | 27.7 | 2.0 | 0.45 | 0.2 | 7.4 | 7.0 | 5.1 | 32.6 | 0.8 | - |
| Bmgj | 19-31 | 35.0 | 27.9 | 25.3 | 22.6 | 2.7 | - | 0.2 | 7.6 | 7.1 | 1.6 | 22.9 | 0.5 | - |
| Btgj | 31-45 | 36.0 | 28.1 | 26.4 | 25.3 | 1.1 | - | 0.2 | 7.8 | 7.3 | 1.8 | 31.8 | 8.4 | - |
| Ckgj | 45-85 | 25.1 | 22.0 | 20.2 | 18.6 | 1.6 | - | 0.2 | 8.1 | 7.6 | - | - | 34.4 | 2.6 |

# BROOKSTON SOIL (BKN)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 43 | 24 | 1 | 20 | 7 | 46 | 34 | SICL | 5.0 | 7.3 | 2.3 |
| Bg | 12 | 53 | 1 | 20 | 6 | 41 | 40 | SICL | 2.0 | 7.2 | 0.8 |
| Ckg | 37 | | 2 | 14 | 4 | 47 | 39 | SICL | - | 7.5 | 17.7 |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### BROOKSTON SOIL ONTARIO 1987 PROFILE NO. TPHD001

LOCATION Township of McGillivray, Lot 16, Con. XIII, NTS Map Area 40P/5, 17 TPT 5395 8920

ELEVATION 245 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Level to nearly level ground moraine, clayey glacial till

SLOPE 1.0% simple

SOIL WATER REGIME Poorly drained, conductivity low, saturation period long

STONINESS Nonstony

CLASSIFICATION Orthic Humic Gleysol

STATUS Typical

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-11 (9-15) | 10YR2/1m | C | moderate, very coarse, subangular blocky | weak, very coarse, subangular blocky | slightly sticky, firm, plastic | |
| Bg1 | 11-38 (20-30) | 5Y4/1m | C | weak to moderate, very coarse, subangular blocky | weak to moderate, coarse, subangular blocky | slightly sticky, firm, very plastic | common, coarse, prominent, 10YR6/4 |
| Bg2 | 38-61 (23-31) | 5Y5/1m | C | weak, very coarse, subangular blocky | weak to moderate, coarse, subangular blocky | slightly sticky, firm, very plastic | common, coarse, prominent, 10YR5/8 |
| Ckg | 61-100 | 5Y5/1m | CL | weak to moderate, very coarse, subangular blocky | weak to moderate, coarse, subangular blocky | slightly sticky, firm, very plastic | many, medium, prominent, 10YR5/8 |

| Horizon | Depth cm | Grav. >2 mm | Sand Fraction % VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2μm % | Bulk Density g/cm$^3$ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0- 11 | 1 | 1 | 3 | 6 | 9 | 4 | 23 | 36 | 41 | 18 | 1.10 | 54 |
| Bg1 | 11- 38 | 0 | 1 | 1 | 5 | 8 | 5 | 20 | 34 | 46 | 20 | 1.35 | 44 |
| Bg2 | 38- 61 | 3 | 1 | 1 | 4 | 9 | 5 | 21 | 35 | 43 | 19 | 1.39 | 43 |
| Ckg | 61-100 | 3 | 5 | 2 | 4 | 6 | 4 | 20 | 47 | 32 | 9 | 1.44 | 46 |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0- 11 | 43.1 | 34.2 | 30.4 | 16.0 | 14.4 | 0.85 | 0.3 | 7.2 | 6.8 | 5.9 | 33.4 | - | - |
| Bg1 | 11- 38 | 37.2 | 32.3 | 30.3 | 16.7 | 13.6 | 0.38 | 0.1 | 7.2 | 6.7 | 1.9 | 26.8 | - | - |
| Bg2 | 38- 61 | 31.0 | 27.3 | 25.8 | 13.2 | 12.6 | 2.17 | 0.2 | 7.6 | 7.2 | 1.1 | 23.5 | 3.3 | - |
| Ckg | 61-100 | 35.2 | 29.6 | 27.3 | 14.8 | 12.5 | 8.88 | 0.2 | 8.1 | 7.6 | - | - | 36.6 | 0.9 |

**ASSOCIATION MEMBERS** Melbourne, moderately well drained
Ekfrid, imperfectly drained
Strathburn, poorly drained

**PARENT MATERIALS** Clayey to fine clayey glaciolacustrine material

# MELBOURNE SOIL (MEL)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Moderately well

USUAL CLASSIFICATION Orthic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 6 | 18 | 1 | 12 | 3 | 49 | 40 | SICL | 5.80 | 7.0 | 0.9 |
| Bt | 8 | 55 | 0 | 3 | 0 | 40 | 57 | SIC | 1.30 | 7.2 | 1.6 |
| Ck | 7 | | 0 | 2 | 0 | 47 | 51 | SIC | - | 7.5 | 24.1 |

# EKFRID SOIL (EKF)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 32 | 21 | 0 | 14 | 3 | 44 | 41 | SIC | 4.90 | 6.9 | 0.9 |
| Bmgj | 12 | 46 | 0 | 6 | 0 | 39 | 55 | C | 1.60 | 7.1 | 1.6 |
| Btgj | 26 | 51 | 0 | 5 | 0 | 38 | 58 | C | 1.20 | 7.2 | 1.90 |
| Ckgj | 38 | | 0 | 3 | 0 | 45 | 52 | SIC | - | 7.6 | 25.7 |

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## EKFRID SOIL ONTARIO 1987 PROFILE NO. TPHD019

| | |
|---|---|
| LOCATION | Ekfrid Township, Range III South, Lot 12, NTS Map Area 40I/12, 17TPT5245 3252 |
| ELEVATION | 206 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Level to nearly level glaciolacustrine clay plain |
| SLOPE | 1.5% complex |
| SOIL WATER REGIME | Imperfectly drained, conductivity low, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Brunisolic Gray Brown Luvisol |
| STATUS | Typical, clay-enriched, Btgj horizon is just below the minimum 60% clay content required for heavy clay textures |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-20 (18-25) | 10YR3/2m | SIC | strong, medium, prismatic | strong, medium, subangular blocky | fine, very sticky, very plastic | |
| Bmgj | 20-33 (12-15) | 10YR5/2m | SIC | strong, very coarse, subangular blocky | strong, medium, subangular blocky | very fine, very sticky, very plastic | many, fine, prominent, 7.5YR5/6 |
| Btgj | 33-50 (6-17) | 10YR4/3m | C | strong, medium, prismatic | strong, medium, subangular blocky | very fine, very sticky, very plastic | common, fine, prominent, 7.5YR5/8 |
| Ckgj | 50-61 (11-22) | 10YR5/3m | SIC | strong, medium, prismatic | strong, fine, subangular blocky | very fine, very sticky, very plastic | common, fine, prominent, 10YR5/6 |
| Ckg | 61-90 | 10YR5/3m | SIC | strong, medium, prismatic | strong, fine, subangular blocky | very fine, very sticky, very plastic | common, fine, prominent, 10YR5/6 |

| | | | Sand Fraction % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. <2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2μm % | Bulk Density g/cm³ | Porosity % |
| Ap | 0-20 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 46 | 44 | 16 | 1.10 | 56 |
| Bmgj | 20-33 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 47 | 47 | 17 | 1.31 | 49 |
| Btgj | 33-50 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 40 | 57 | 20 | 1.56 | 39 |
| Ckgj | 50-61 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 50 | 48 | 14 | 1.44 | 46 |
| Ckg | 61-90 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 45 | 53 | 13 | 1.45 | 46 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-20 | - | - | - | - | - | 0.05 | 0.2 | 6.9 | 6.5 | 4.4 | 29.9 | - | - |
| Bmgj | 20-35 | - | - | - | - | - | 0.32 | 0.3 | 6.4 | 6.0 | 1.0 | 20.7 | - | - |
| Btgj | 35-50 | - | - | - | - | - | 0.13 | 0.5 | 7.3 | 7.0 | 0.7 | 34.2 | 0.7 | - |
| Ckgj | 50-61 | - | - | - | - | - | 0.13 | 0.5 | 7.8 | 7.6 | - | - | 22.9 | 3.3 |
| Ckg | 61-90 | - | - | - | - | - | 0.18 | 0.6 | 7.9 | 7.6 | - | - | 29.7 | 3.6 |

# STRATHBURN SOIL (SBN)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Humic Luvic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 23 | 22 | 0 | 7 | 1 | 42 | 51 | SIC | 7.0 | 6.8 | 0.6 |
| Btg | 12 | 61 | 0 | 4 | 0 | 37 | 60 | HC | 2.8 | 6.9 | 1.1 |
| Bg | 22 | 74 | 0 | 5 | 0 | 38 | 57 | C | 1.7 | 7.1 | 1.1 |
| Ckg | 13 | | 0 | 3 | 0 | 47 | 49 | C | - | 7.6 | 20.8 |

# MURIEL ASSOCIATION

**ASSOCIATION MEMBERS** Muriel, moderately well drained
Gobles, imperfectly drained
Kelvin, poorly drained

**PARENT MATERIALS** Clayey glacial till

# MURIEL SOIL (MUI)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Moderately well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol**

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 1 | 22 | 1 | 19 | 10 | 57 | 23 | SIL | 3.4 | 6.9 | - |
| Bm | 1 | 28 | 2 | 18 | 9 | 60 | 22 | SIL | 0.8 | 5.6 | - |
| Bt1 | 1 | 38 | 1 | 10 | 5 | 52 | 38 | SICL | 0.6 | 5.9 | - |
| Bt2 | 1 | 71 | 1 | 11 | 5 | 51 | 39 | SICL | 0.4 | 6.2 | - |
| Ckgj | 1 | | 2 | 9 | 0 | 62 | 29 | SICL | - | 7.4 | 11.1 |

** Horizon sequence in the generalized profile is based on a small number of sampled sites and therefore may not represent the common horizon sequence of a Brunisolic Gray Brown Luvisol.

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### MURIEL SOIL ONTARIO 1987 PROFILE NO. TPHD002

LOCATION Township of North Dorchester, Lot 19 , Con. VI, NTS Map Area 40I/14, 17 TPT 9625 4930

ELEVATION 275 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Very gently, to gently sloping terminal moraine, clayey glacial till

SLOPE 2.5% simple

SOIL WATER REGIME Moderately well drained, conductivity low, saturation period short

STONINESS Nonstony

CLASSIFICATION Brunisolic Gray Brown Luvisol

STATUS Taxadjunct to Brunisolic Gray Brown Luvisol

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-22 (18-22) | 10YR3/3m | SIL | weak, coarse, subangular blocky | weak, medium, subangular blocky | slightly sticky, soft, very plastic | |
| Bm | 22-28 (0-27) | 10YR5/4m | SIL | weak, coarse, subangular blocky | weak to moderate, fine to medium, subangular blocky | slightly sticky, slightly hard, very plastic | |
| Bt1 | 28-38 (6-13) | 7.5YR4/2m | SICL | moderate, coarse, angular blocky | moderate, coarse, subangular blocky | slightly sticky, very hard, very plastic | |
| Bt2 | 38-71 (15-33) | 10YR4/2m | SICL | moderate, medium, prismatic | strong, medium, angular blocky | slightly sticky, very hard, very plastic | |
| Ckgj | 71-102 | 10YR4/2m | SICL | strong, medium to coarse, prismatic | strong, coarse, angular blocky | slightly sticky, very hard, very plastic | common, fine, distinct, 10YR5/4 |

| | | Sand Fraction % | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2μm % | Bulk Density g/cm$^3$ | Porosity % |
| Ap | 0-22 | 1 | 1 | 1 | 3 | 5 | 10 | 19 | 57 | 23 | 10 | 1.12 | 55 |
| Bm | 22-28 | 2 | 0 | 1 | 2 | 4 | 9 | 18 | 60 | 22 | 8 | 1.13 | 56 |
| Bt1 | 28-38 | 1 | 0 | 1 | 1 | 3 | 5 | 10 | 52 | 38 | 14 | 1.35 | 47 |
| Bt2 | 38-71 | 1 | 1 | 1 | 1 | 3 | 5 | 11 | 51 | 39 | 14 | 1.42 | 45 |
| Ckgj | 71-102 | 2 | 0 | 0 | 0 | 0 | 0 | 9 | 62 | 29 | 9 | 1.40 | 47 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-22 | - | - | - | - | - | 0.24 | 0.2 | 7.4 | 6.9 | 3.4 | 21.2 | 0.0 | - |
| Bm | 22-28 | - | - | - | - | - | 0.56 | 0.1 | 6.2 | 5.6 | 0.8 | 14.6 | 0.0 | - |
| Bt1 | 28-38 | - | - | - | - | - | 0.03 | 0.1 | 6.4 | 5.9 | 0.6 | 16.3 | 0.0 | - |
| Bt2 | 38-71 | - | - | - | - | - | 0.08 | 0.1 | 6.6 | 6.2 | 0.4 | 17.9 | 0.0 | - |
| Ckgj | 71-102 | - | - | - | - | - | 0.02 | 0.2 | 7.9 | 7.4 | - | 23.6 | 11.1 | 1.9 |

# GOBLES SOIL (GOB)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 31 | 25 | 2 | 25 | 8 | 46 | 29 | CL | 3.30 | 7.1 | 1.1 |
| Bmgj | 5 | 47 | 1 | 33 | 6 | 33 | 34 | CL | 1.3 | 7.2 | 0.5 |
| Btgj | 15 | 60 | 2 | 15 | 5 | 44 | 42 | SIC | 0.9 | 7.2 | 2.2 |
| Ckgj | 28 | | 2 | 14 | 4 | 48 | 38 | SICL | - | 7.6 | 19.0 |

# KELVIN SOIL (KVN)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 9 | 21 | 1 | 28 | 11 | 42 | 31 | CL | 4.3 | 7.0 | 1.1 |
| Bg | 2 | 55 | 2 | 14 | 4 | 35 | 52 | C | 1.9 | 7.2 | 0.6 |
| Ckg | 10 | | 6 | 17 | 5 | 48 | 36 | SICL | - | 7.6 | 21.6 |

ASSOCIATION MEMBERS Plainfield, rapidly drained
Walsingham, imperfectly drained
Waterin, poorly drained

PARENT MATERIALS Eolian fine sand,and eolian modified, glaciolacustrine fine sand

# PLAINFIELD SOIL (PFD)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Rapid

USUAL CLASSIFICATION Orthic Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 32 | 23 | 1 | 83 | 25 | 12 | 6 | FS | 3.3 | 6.9 | 1.5 |
| Bm1 | 19 | 42 | 0 | 88 | 24 | 10 | 3 | FS | 1.4 | 6.8 | 0.4 |
| Bm2 | 19 | 77 | 0 | 91 | 25 | 7 | 2 | FS | 0.6 | 6.8 | 0.4 |
| Ck | 13 | | 0 | 88 | 22 | 8 | 4 | FS | - | 7.5 | 18.2 |

* This soil is classified as a Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may occur in Middlesex, it is not the most common.

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### PLAINFIELD SOIL ONTARIO 1987 PROFILE NO. TPHD005

LOCATION Township of Caradoc, Lot 17, Con. X, NTS Map Area 40I/13, 17 TPT 5182 5745

ELEVATION 230 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Very gently sloped eolian sand plain, eolian fine sand deposits

SLOPE 2.5% complex

SOIL WATER REGIME Rapidly drained, conductivity medium to high, saturation period short

STONINESS Nonstony

CLASSIFICATION Orthic Melanic Brunisol

STATUS Taxadjunct to Brunisolic Gray Brown Luvisol

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-21 (16-25) | 10YR3/2m | FS | single grain | | nonsticky, loose, nonplastic | |
| Bm1 | 21-31 (7-28) | 10YR4/6m | FS | single grain | | nonsticky, loose, nonplastic | |
| Bm2 | 31-102 (12-120) | 10YR4/4m | FS | single grain | | nonsticky, loose, nonplastic | |
| BC | 102-119 (0-38) | | FS | single grain | | nonsticky, loose, nonplastic | |
| Ck | 119-149 | 10YR7/2m | FS | single grain | | nonsticky, loose, nonplastic | |

| | | | Sand Fraction % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm$^3$ | Porosity % |
| Ap | 0-21 | 1 | 0 | 1 | 12 | 63 | 13 | 89 | 7 | 5 | 2 | 1.25 | 52 |
| Bm1 | 21-31 | 0 | 0 | 0 | 10 | 68 | 16 | 95 | 3 | 2 | 0 | 1.33 | 50 |
| Bm2 | 31-102 | 0 | 0 | 0 | 1 | 64 | 30 | 95 | 3 | 3 | 1 | 1.33 | 51 |
| BC | 102-119 | 0 | 0 | 0 | 1 | 52 | 43 | 95 | 3 | 2 | 0 | 1.22 | 56 |
| Ck | 119-149 | 0 | 0 | 0 | 0 | 65 | 32 | 97 | 2 | 1 | 1 | 1.33 | 50 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-21 | 38.1 | 22.2 | 8.6 | 2.8 | 5.8 | 6.36 | 0.4 | 7.2 | 6.9 | 1.6 | 13.6 | - | - |
| Bm1 | 21-31 | 31.9 | 15.7 | 7.1 | 2.0 | 5.1 | - | 0.1 | 7.6 | 7.3 | 0.2 | 10.3 | 0.3 | - |
| Bm2 | 31-102 | 31.8 | 15.3 | 4.3 | 1.4 | 2.9 | 13.20 | 0.1 | 7.6 | 7.3 | 0.2 | 12.3 | 0.5 | - |
| BC | 102-119 | 33.5 | 20.2 | 6.4 | 1.0 | 5.4 | 16.56 | 0.1 | 8.1 | 7.4 | 0.1 | 10.3 | 7.8 | - |
| Ck | 119-149 | 33.0 | 24.0 | 2.3 | 1.0 | 1.3 | 12.78 | 0.1 | 8.3 | 7.5 | - | - | 21.8 | 1.1 |

# WALSINGHAM SOIL (WAM)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Melanic Brunisol*

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 45 | 21 | 1 | 84 | 24 | 11 | 5 | LFS | 3.50 | 6.6 | 0.5 |
| Bmgj1 | 50 | 55 | 0 | 89 | 26 | 8 | 3 | FS | 1.2 | 6.4 | 0.5 |
| Bmgj2 | 47 | 81 | 0 | 91 | 26 | 6 | 3 | FS | 0.4 | 6.3 | 0.2 |
| Ckgj | 28 | | 0 | 92 | 30 | 6 | 3 | FS | - | 7.5 | 15.2 |

* This soil is classified as a Gleyed Brunisolic Gray Brown Luvisol in the Provincial Soil Names File. While this classification may be found in Middlesex, it is not the most common.

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## WALSINGHAM SOIL ONTARIO 1987 PROFILE NO. TPHD006

| | |
|---|---|
| LOCATION | Township of Mosa, Lot 19, Con. II, NTS Map Area 40I/12,17 TPT 3357 2555 |
| ELEVATION | 215 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Very gently sloped, eolian modified, glaciolacustrine sand plain |
| SLOPE | 2.0% complex |
| SOIL WATER REGIME | Imperfectly drained, conductivity medium to high, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Gleyed Melanic Brunisol |
| STATUS | Taxadjunct to Gleyed Brunisolic Gray Brown Luvisol, textures of VFS are not typical in Walsingham soils and VFS contents for all horizons are generally at the high end of the range for Plainfield association soils. |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-15 (14-18) | 10YR3/3m | FS | single grain | | nonsticky, loose, nonplastic | |
| Bm | 15-43 (25-42) | 10YR6/6m | FS | single grain | | nonsticky, loose, nonplastic | |
| Bmgj1 | 43-65 (7-23) | 10YR6/6m | FS | weak, coarse, platy | single grain | nonsticky, soft, nonplastic | common, medium, prominent, 5YR5/8 |
| Bmgj2 | 65-87 (15-27) | 10YR6/3m | FS | single grain | | nonsticky, loose, nonplastic | many, coarse, prominent, 7.5YR6/8 |
| Bg | 87-116 (16-30) | 10YR7/2m | VFS | single grain | | nonsticky, loose, nonplastic | many, coarse, prominent, 10YR4/6 |
| Ckg | 116-150 | 10YR7/1m | FS | weak, coarse, platy | single grain | nonsticky, loose, nonplastic | common, coarse, prominent, 10YR5/6 |

| | | | Sand Fraction % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm$^3$ | Porosity % |
| Ap | 0-15 | 0 | 0 | 0 | 2 | 48 | 38 | 89 | 8 | 4 | 2 | 1.15 | 58 |
| Bm | 15-43 | 0 | 0 | 0 | 3 | 55 | 35 | 93 | 6 | 1 | 0 | 1.17 | 56 |
| Bmgj1 | 43-65 | 0 | 0 | 1 | 2 | 48 | 41 | 92 | 6 | 2 | 1 | 1.27 | 55 |
| Bmgj2 | 65-87 | 0 | 0 | 0 | 1 | 45 | 47 | 94 | 3 | 3 | 2 | 1.35 | 60 |
| Bg | 87-116 | 0 | 0 | 0 | 1 | 36 | 56 | 93 | 4 | 3 | 2 | 1.34 | 52 |
| Ckg | 116-150 | 0 | 0 | 0 | 4 | 48 | 44 | 96 | 2 | 2 | 1 | 1.41 | 45 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-15 | 47.9 | 36.2 | 10.1 | 3.4 | 6.7 | 4.61 | 0.1 | 5.8 | 5.2 | 2.4 | 11.0 | - | - |
| Bm | 15-43 | 40.1 | 30.5 | 11.3 | 3.3 | 8.0 | 5.22 | 0.1 | 6.1 | 5.4 | 1.0 | 10.0 | - | - |
| Bmgj1 | 43-65 | 35.4 | 26.8 | 7.0 | 2.0 | 5.0 | 10.56 | 0.0 | 6.1 | 5.5 | 0.3 | 10.0 | - | - |
| Bmgj2 | 65-87 | 34.0 | 25.5 | 7.3 | 2.4 | 4.9 | 10.20 | 0.0 | 6.8 | 6.1 | 0.0 | 10.3 | - | - |
| Bg | 87-116 | 35.0 | 26.3 | 6.0 | 1.8 | 4.2 | - | 0.1 | 7.2 | 6.5 | 0.1 | 11.0 | - | - |
| Ckg | 116-150 | 31.6 | 25.7 | 4.7 | 1.0 | 3.7 | 16.20 | 0.1 | 8.2 | 7.3 | - | - | 20.6 | 1.8 |

# WATERIN SOIL (WRN)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 8 | 25 | 1 | 80 | 25 | 12 | 8 | LFS | 4.3 | 7.0 | 1.1 |
| Bg1 | 3 | 62 | 0 | 87 | 31 | 8 | 5 | FS | 0.8 | 7.0 | 0.4 |
| Bg2 | 3 | 84 | 0 | 92 | 27 | 5 | 4 | FS | 0.5 | 7.2 | 2.0 |
| Ckg | 7 | | 0 | 94 | 18 | 4 | 2 | FS | - | 7.4 | 16.4 |

**ASSOCIATION MEMBERS** Teeswater, well drained
Fanshawe, imperfectly drained
Ballymote, poorly drained

**PARENT MATERIALS** Loamy glaciolacustrine material 40 to 100 cm deep overlying gravelly glaciofluvial deposits

# TEESWATER SOIL (TEW)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 7 | 24 | 1 | 33 | 18 | 52 | 15 | SIL | 2.5 | 7.2 | 1.3 |
| Bm | 4 | 36 | 0 | 38 | 26 | 47 | 15 | L | 0.7 | 6.6 | 0.3 |
| Bt | 6 | 50 | 7 | 38 | 16 | 38 | 24 | L | 0.9 | 7.3 | 3.4 |
| Ck | 3 | 61 | 4 | 55 | 19 | 33 | 12 | SL | - | 7.4 | 9.5 |
| IICk | 9 | | 30 | 71 | 8 | 20 | 9 | GSL | - | 7.6 | 35.2 |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### TEESWATER SOIL ONTARIO 1987 PROFILE NO. TPHD010

LOCATION Township of West Nissouri, Lot 11, Con. II, NTS Map Area 40P/3, 17 TPT 8700 6892

ELEVATION 275 metres

SITE Row crop

LANDFORM AND PARENT MATERIALS Nearly level to very gently sloping glaciofluvial outwash terrace

SLOPE 1.5% simple

SOIL WATER REGIME Well drained, conductivity medium to low, saturation period short

STONINESS Nonstony

CLASSIFICATION Brunisolic Gray Brown Luvisol

STATUS Typical

COMMENT Profile has a high content of cobbles in IICk2 as well as high gravel content

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-30 (27-29) | 10YR3/2m | SIL | strong, fine to medium, granular | strong, fine, granular | nonsticky, very firm, slightly plastic | |
| Ae | 30-41 (9-11) | 10YR5/2m | SIL | single grain | | slightly sticky, loose, nonplastic | |
| Bm | 41-52 (9-14) | 10YR4/3m | L | single grain | | slightly sticky, loose, nonplastic | |
| Bt | 52-73 (16-22) | 7.5YR4/4m | CL | strong, medium, subangular blocky | strong, fine, subangular blocky | sticky, hard, very plastic | |
| IICk1 | 73-83 (6-10) | 10YR4/4m | GL | single grain | | nonsticky, loose, slightly plastic | |
| IICk2 | 83-110 | 10YR5/4m | VGLCS | single grain | | nonsticky, loose, nonplastic | |

| Horizon | Depth cm | Grav. >2 mm | Sand Fraction % VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-30 | 0 | 1 | 1 | 4 | 10 | 13 | 31 | 56 | 13 | 6 | .93 | 64 |
| Ae | 30-41 | 1 | 1 | 1 | 5 | 9 | 11 | 27 | 65 | 8 | 4 | 1.15 | 55 |
| Bm | 41-52 | 0 | 0 | 1 | 10 | 22 | 15 | 49 | 42 | 9 | 4 | 1.35 | 39 |
| Bt | 52-73 | 0 | 0 | 1 | 5 | 12 | 13 | 31 | 39 | 30 | 17 | 1.51 | 30 |
| IICk1 | 73-83 | 23 | 2 | 5 | 11 | 16 | 14 | 48 | 42 | 9 | 5 | - | - |
| IICk2 | 83-110 | 75 | 13 | 30 | 20 | 15 | 5 | 84 | 11 | 4 | 3 | - | - |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-30 | 71.5 | 45.6 | 32.4 | 9.4 | 23.0 | 15.36 | 0.3 | 7.5 | 7.1 | 5.3 | 23.8 | - | - |
| Ae | 30-41 | 47.3 | 36.6 | 24.9 | 4.3 | 20.6 | 2.09 | 0.2 | 7.3 | 6.7 | 3.0 | 12.0 | - | - |
| Bm | 41-52 | 28.6 | 22.1 | 14.3 | 2.5 | 11.8 | 1.03 | 0.1 | 7.1 | 6.4 | 0.3 | 10.3 | - | - |
| Bt | 52-73 | 29.2 | 21.9 | 16.3 | 6.6 | 9.7 | 0.35 | 0.1 | 7.0 | 6.5 | 0.7 | 19.2 | - | - |
| IICk1 | 73-83 | - | - | - | - | - | - | 0.2 | 8.0 | 7.4 | - | - | 30.9 | 0.7 |
| IICk2 | 83-110 | - | - | - | - | - | - | 0.2 | 8.1 | 7.5 | - | - | 52.2 | 1.6 |

# FANSHAWE SOIL (FAN)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol**

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Texture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 7 | 32 | 2 | 20 | 8 | 58 | 22 | SIL | 5.2 | 7.3 | 4.6 |
| Bmgj | 3 | 56 | 1 | 16 | 10 | 63 | 21 | SIL | 0.8 | 7.4 | 1.8 |
| Ckgj | 3 | 66 | 17 | 33 | 9 | 45 | 22 | L | - | 7.4 | 14.7 |
| IICkgj | 6 | | 32 | 58 | 8 | 30 | 12 | GCSL | - | 7.6 | 35.1 |

** Horizon sequence in the generalized profile is based on a small number of sampled sites and therefore may not represent the common horizon sequence of Gleyed Brunisolic Gray Brown Luvisol

# BALLYMOTE SOIL (BLL)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 1 | 22 | 1 | 43 | 6 | 37 | 20 | L | 7.4 | 7.0 | 1.0 |
| Bg | 1 | 65 | 3 | 49 | 8 | 36 | 15 | L | 1.0 | 7.4 | 2.0 |
| IICkg | 1 | | 10 | 78 | 5 | 17 | 5 | LS | - | 7.6 | 53.0 |

# WALSHER ASSOCIATION

**ASSOCIATION MEMBERS** Walsher, well drained
Vittoria, imperfectly drained
Silver Hill, poorly drained

**PARENT MATERIALS** 40 to 100 cm of sandy textures overlying loamy glaciolacustrine material

# WALSHER SOIL (WSH)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol**

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 2 | 30 | 5 | 77 | 15 | 14 | 10 | FSL | 2.6 | 6.6 | - |
| Bm | 2 | 55 | 5 | 73 | 29 | 15 | 12 | FSL | 1.5 | 6.7 | 0.6 |
| IICk | 3 | | 3 | 39 | 21 | 41 | 19 | L | - | 7.4 | 23.3 |

** Horizon sequence in the generalized profile is based on a small number of sampled sites and therefore may not represent the common horizon sequence of a Brunisolic Gray Brown Luvisol.

# WALSHER SOIL - TILL PHASE (WSH.T)

Insufficient sites exist in the Middlesex data base to generate a generalized profile for Walsher Till Phase soils

# VITTORIA SOIL (VIT)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 21 | 25 | 2 | 72 | 19 | 19 | 9 | FSL | 3.40 | 7.1 | 1.8 |
| Aegj | 5 | 45 | 2 | 77 | 20 | 17 | 6 | LFS | 1.1 | 7.1 | 0.5 |
| Bmgj | 19 | 52 | 1 | 81 | 20 | 13 | 6 | LFS | 1.0 | 7.0 | 0.5 |
| Btgj | 4 | 60 | 3 | 74 | 19 | 14 | 13 | FSL | 0.4 | 7.1 | 0.3 |
| IICkgj | 22 | | 1 | 24 | 17 | 63 | 12 | SIL | - | 7.6 | 30.7 |

# DETAILED PROFILE DESCRIPTIONS AND ANALYSES

## VITTORIA SOIL ONTARIO 1987 PROFILE NO. TPHD013

| | |
|---|---|
| LOCATION | Township of Caradoc, Lot 16, Con. II, NTS Map Area 40I/14, 17 TPT 5965 4945 |
| ELEVATION | 245 metres |
| SITE | Row crop |
| LANDFORM AND PARENT MATERIALS | Very gently to gently undulating knoll on a glaciolacustrine plain, eolian sand overlying loamy glaciolacustrine material |
| SLOPE | 2.5% complex |
| SOIL WATER REGIME | Imperfeclty drained, conductivity medium, saturation period medium |
| STONINESS | Nonstony |
| CLASSIFICATION | Brunisolic Gray Brown Luvisol |
| STATUS | Typical |

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-23 (22-26) | 10YR3/2m | LFS | single grain | | nonsticky, loose, nonplastic | |
| Bm | 23-34 (6-11) | 10YR4/6m | LFS | single grain | | nonsticky, loose, nonplastic | |
| Aegj | 34-49 (15-19) | 10YR6/4m | FS | single grain | | nonsticky, loose, nonplastic | many, medium, distinct, 10YR5/6 |
| Btgj | 49-61 (7-12) | 7.5YR5/6m | LFS | weak, medium, platy | | nonsticky, very firm, nonplastic | common, medium, prominent, 7.5YR5/6 |
| IICkg | 61-110 | 10YR6/2m | SIL | moderate, coarse, platy | weak, medium, platy | slightly sticky, friable, slightly plastic | many, coarse, prominent, 7.5YR5/8 |

| Horizon | Depth cm | Sand Fraction % Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-23 | 0 | 0 | 0 | 5 | 42 | 28 | 77 | 18 | 5 | 3 | 1.14 | 57 |
| Bm | 23-34 | 0 | 0 | 0 | 3 | 40 | 41 | 86 | 13 | 2 | 1 | 1.21 | 59 |
| Aegj | 34-49 | 0 | 0 | 0 | 0 | 50 | 37 | 88 | 8 | 4 | 1 | 1.29 | 54 |
| Btgj | 49-61 | 0 | 0 | 0 | 0 | 33 | 45 | 78 | 15 | 7 | 3 | 1.42 | 48 |
| IICkg | 61-110 | 0 | 0 | 0 | 0 | 0 | 18 | 19 | 78 | 4 | 1 | 1.35 | 50 |

| Horizon | Depth cm | % Moisture Retention (g/g) 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 0-23 | 43.8 | 32.3 | 15.9 | 4.4 | 11.5 | 4.92 | 0.1 | 6.9 | 6.3 | 2.6 | 10.7 | - | - |
| Bm | 23-34 | 38.9 | 28.6 | 13.1 | 3.5 | 9.6 | 3.06 | 0.1 | 6.4 | 5.8 | 1.3 | 10.3 | - | - |
| Aegj | 34-49 | 34.0 | 25.5 | 8.6 | 2.2 | 6.4 | 6.96 | 0.1 | 6.7 | 6.1 | 0.3 | 14.6 | - | - |
| Btgj | 49-61 | 31.9 | 21.3 | 6.8 | 2.3 | 4.5 | 2.39 | 0.1 | 7.1 | 6.6 | 0.4 | 10.3 | - | - |
| IICkg | 61-110 | 28.6 | 23.6 | 19.9 | 5.6 | 14.3 | 0.56 | 0.1 | 8.2 | 7.6 | - | - | 21.2 | 1.2 |

# VITTORIA SOIL - TILL PHASE (VIT.T)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 13 | 27 | 2 | 62 | 16 | 28 | 10 | SL | 3.2 | 6.9 | 0.7 |
| Bmgj | 11 | 66 | 1 | 71 | 19 | 21 | 8 | SL | 0.6 | 7.0 | 0.9 |
| Btgj | 3 | 71 | 2 | 68 | 25 | 18 | 14 | SL | 0.5 | 7.2 | 1.2 |
| IICkgj | 12 | | 9 | 33 | 13 | 49 | 18 | L | - | 7.6 | 27.9 |

# SILVER HILL SOIL (SIH)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol**

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 1 | 33 | 1 | 63 | 5 | 23 | 14 | SL | 6.70 | 6.90 | - |
| Ck | 1 | 90 | 12 | 77 | 6 | 18 | 5 | LS | - | 7.30 | 26.5 |
| IICkg | 1 | | 0 | 28 | 14 | 60 | 12 | SIL | - | 7.40 | 26.7 |

** Horizon sequence in the generalized profile is based on a small number of sampled sites and therefore may not represent the common horizon sequence of a Orthic Humic Gleysol.

# SILVER HILL SOIL - TILL PHASE (SIH.T)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol**

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 1 | 23 | 6 | 63 | 25 | 22 | 15 | FSL | 3.2 | 7.3 | 2.0 |
| Ckg | 1 | 42 | 2 | 62 | 21 | 24 | 15 | FSL | - | 7.1 | 1.0 |
| IICkg | 1 | | 10 | 34 | 6 | 42 | 24 | L | - | 7.6 | 39.0 |

** Horizon sequence in the generalized profile is based on a small number of sampled sites and therefore may not represent the common horizon sequence of a Orthic Humic Gleysol.

ASSOCIATION MEMBERS Wattford, well drained
Normandale, imperfectly drained
St. Williams, poorly drained

PARENT MATERIALS Fine sandy loam, loamy very fine sand, and very fine sand textured material with occasional horizons of fine sand and loamy fine sand

# WATTFORD SOIL (WAT)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Well

USUAL CLASSIFICATION Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 13 | 23 | 3 | 68 | 22 | 23 | 9 | FSL | 3.6 | 7.1 | 2.6 |
| Bm | 8 | 60 | 2 | 85 | 28 | 12 | 4 | LFS | 0.7 | 6.8 | 0.5 |
| Bt | 4 | 87 | 0 | 78 | 33 | 17 | 6 | VFSL | 0.2 | 6.8 | 0.2 |
| Ck | 8 | | 3 | 72 | 33 | 22 | 6 | VFSL | - | 7.5 | 18.1 |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### WATTFORD SOIL ONTARIO 1987 PROFILE NO. TPHD003

LOCATION Township of North Dorchester, Lot 18, Con. B, NTS Map Area 40I/14, 17 TPT 9505 5767

ELEVATION 260 metres

SITE Row crops

LANDFORM AND PARENT MATERIALS Nearly level to very gently sloping glaciolacustrine plain, glaciolacustrine sands

SLOPE 1.0% simple

SOIL WATER REGIME Well drained, conductivity medium, saturation period medium

STONINESS Nonstony

CLASSIFICATION Brunisolic Gray Brown Luvisol

STATUS Typical, sandy textures in some horizons are coarser grained than usual

COMMENT Spiral shell fragments and stratification present in parent material

| Horizon | Depth (range) cm | Colour moist dry | Texture | Primary Structure | Secondary Structure | Consistence | Mottles |
|---|---|---|---|---|---|---|---|
| Ap | 0-24 (20-28) | 10YR3/2m | LS | single grain | | nonsticky, loose, nonplastic | |
| Bm | 24-53 (5-38) | 10YR4/4m | FS | single grain | | nonsticky, loose, nonplastic | |
| Bt | 53-71 (6-35) | 7.5YR3/4m | FSL | single grain | | slightly sticky, loose, slightly plastic | |
| Ck | 71-133 | 10YR6/3m | FS | single grain | | nonsticky, loose, nonplastic | |

| | | Sand Fraction % | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | Grav. >2 mm | VCS 2-1 mm | CS 1-.5 mm | MS .5-.25 mm | FS .25-.1 mm | VFS .1-.05 mm | Sand % | Silt % | Clay % | Fine Clay <2µm % | Bulk Density g/cm³ | Porosity % |
| Ap | 0-24 | 3 | 1 | 2 | 26 | 45 | 11 | 84 | 10 | 5 | 3 | 1.26 | 52 |
| Bm | 24-53 | 6 | 1 | 1 | 26 | 50 | 11 | 89 | 8 | 3 | 1 | 1.41 | 46 |
| Bt | 53-71 | 0 | 0 | 0 | 24 | 50 | 8 | 83 | 4 | 13 | 7 | 1.33 | 49 |
| Ck | 71-133 | 0 | 0 | 1 | 31 | 59 | 6 | 97 | 2 | 1 | 0 | 1.22 | 54 |

| | | % Moisture Retention (g/g) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizon | Depth cm | 0 kPa | 5 kPa | 33 kPa | 1500 kPa | Available Moisture % | Hydr. Cond. cm/hr | Elec. Cond. mmhos/cm | pH $H_2O$ | pH $CaCl_2$ | Organic Matter % | CEC me/100g | $CaCO_3$ % | Cal/Dol Ratio |
| Ap | 0-24 | 33.8 | 19.6 | 9.5 | 2.4 | 7.1 | 5.44 | 0.1 | 6.1 | 5.5 | 2.2 | 11.3 | - | - |
| Bm | 24-53 | 29.1 | 16.6 | 7.7 | 2.2 | 5.5 | 6.00 | 0.1 | 6.6 | 6.0 | 0.4 | 11.3 | - | - |
| Bt | 53-71 | 30.8 | 13.3 | 6.1 | 1.8 | 4.3 | 6.19 | 0.1 | 6.6 | 6.1 | 0.6 | 14.9 | - | - |
| Ck | 71-133 | - | - | - | - | - | - | 0.1 | 8.4 | 7.4 | - | - | 21.0 | 1.5 |

# NORMANDALE SOIL (NDE)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Imperfect

USUAL CLASSIFICATION Gleyed Brunisolic Gray Brown Luvisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 25 | 22 | 0 | 66 | 28 | 23 | 10 | FSL | 3.90 | 6.8 | 0.7 |
| Bmgj | 28 | 61 | 1 | 77 | 31 | 17 | 6 | LFS | 0.9 | 6.5 | 0.7 |
| Btgj | 11 | 74 | 0 | 70 | 30 | 15 | 15 | VFSL | 0.4 | 6.7 | 1.2 |
| Ckgj | 18 | | 1 | 73 | 37 | 21 | 6 | VFSL | - | 7.5 | 18.7 |

# ST. WILLIAMS SOIL (SLI)

## GENERALIZED PROFILE CHARACTERISTICS

DRAINAGE Poor

USUAL CLASSIFICATION Orthic Humic Gleysol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Tex-ture | Org. M % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ap | 4 | 29 | 1 | 65 | 29 | 23 | 13 | VFSL | 8.9 | 7.3 | 3.3 |
| Bg | 4 | 51 | 1 | 78 | 51 | 17 | 5 | LVFS | 1.0 | 7.4 | 11.2 |
| Ckg1 | 2 | 71 | 4 | 86 | 44 | 11 | 4 | LFS | - | 7.6 | 22.1 |
| Ckg2 | 4 | | 1 | 82 | 53 | 15 | 3 | LVFS | - | 7.7 | 31.1 |

# DEEP ORGANIC LANDSCAPE UNITS

## OD1 LANDSCAPE UNIT

### GENERALIZED PROFILE CHARACTERISTICS

PARENT MATERIALS Sedge fen peat greater than 160 cm deep

DRAINAGE Very poor

USUAL CLASSIFICATION Typic Mesisol

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Peat Material and Texture | Stage of Decompostion | Organic Matter % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Om1 | 4 | 40 | - | - | - | - | - | SFP | Mesic | 88 | 6.5 | - |
| Om2 | 4 | 133 | - | - | - | - | - | SFP | Mesic | 74 | 6.0 | - |
| Om3 | 3 | 199 | - | - | - | - | - | SFP | Mesic | 65 | 6.3 | - |
| IICkg | 1 | | 0 | 1 | 0 | 81 | 18 | SIL | - | - | 7.5 | 33.5 |

### DETAILED PROFILE DESCRIPTIONS AND ANALYSES

**SOIL OF THE OD1 LANDSCAPE UNIT ONTARIO 1987 PROFILE NO. JWMG012**

LOCATION Township of North Dorchester, Lot 21, Con. II, NTS Map Area 40I/14, 17TMT 9393 5390

ELEVATION 274 metres

SITE Swamp

LANDFORM AND PARENT MATERIALS Nearly level, depressional area surrounding kettle pond, mesic sedge fen peat overlying mineral material

SLOPE 0.5% simple

SOIL WATER REGIME Very poorly drained, conductivity high, saturation period prolonged

STONINESS Nonstony

CLASSIFICATION Typic Mesisol

STATUS Typical

MORPHOLOGICAL DESCRIPTION, CHEMICAL AND PHYSICAL ANALYSES

| Horizon | Depth cm | Colour (moist) | Peat Material and Texture | Stage of Decomposition | von Post Scale | Woody Material Volume % | Organic Matter % | pH $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|
| Om1 | 0-29 | 10YR2/1m | SFP | Mesic | 6 | <10 | 81.8 | 6.0 | - |
| Om2 | 29-117 | 10YR3/4m | SFP | Mesic | 6 | <10 | 85.7 | 6.6 | - |
| Om3 | 117-224 | 10YR2/1m | SFP | Mesic | 6 | <10 | 71.5 | 6.6 | - |
| IICkg | 224-300 | 5YR4/3m | LIM** | - | - | - | - | 7.3 | 81.5 |

** Limic material is composed mainly of diatomaceous earth mixed with some marl.

# OD2 LANDSCAPE UNIT

## GENERALIZED PROFILE CHARACTERISTICS

| | |
|---|---|
| PARENT MATERIALS | Mesic woody sedge fen peat and occasionally woody forest peat overlying sedge fen peat with a total depth of greater than 160 cm |
| DRAINAGE | Very poor |
| USUAL CLASSIFICATION | Typic Mesisol |

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Peat Material and Texture | Stage of Decompostion | Organic Matter % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Om1 | 4 | 119 | - | - | - | - | - | WSFP | Mesic | 74 | 6.2 | - |
| Om2 | 4 | 189 | - | - | - | - | - | WSFP | Mesic | 75 | 5.7 | - |
| Om3 | 3 | 231 | - | - | - | - | - | SFP | Mesic | 59 | 6.2 | - |
| IICkg | 1 | | 2 | 62 | 15 | 28 | 10 | FSL | - | - | - | - |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### SOIL OF THE OD2 LANDSCAPE UNIT ONTARIO 1987 PROFILE NO. JWMG024

| | |
|---|---|
| LOCATION | Township of North Dorchester, Lot 12, Con. IV, NTS Map Area 40I/14, 17TMT 9615 6079 |
| ELEVATION | 274 metres |
| SITE | Swamp, recently cleared |
| LANDFORM AND PARENT MATERIAL | Nearly level, depressional area, woody forest peat and woody sedge fen peat succeeding to sedge fen peat overlying limnic and mineral material |
| SLOPE | 0.5% simple |
| SOIL WATER REGIME | Very poorly drained, conductivity high, saturation period prolonged |
| STONINESS | Nonstony |
| CLASSIFICATION | Typic Mesisol |
| STATUS | Typical, occasional fibric horizons are not uncommon |

MORPHOLOGICAL DESCRIPTION, CHEMICAL AND PHYSICAL ANALYSES

| Horizon | Depth cm | Colour (moist) | Peat Material and Texture | Stage of Decomposition | von Post Scale | Woody Material Volume % | Organic Matter % | pH $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|
| Om1 | 0-80 | 10YR2/1m | WSFP | Mesic | 6 | 10-20 | 60.4 | 6.9 | - |
| Of | 80-92 | 10YR2/4m | WFP | Fibric | 6 | 20-30 | 79.9 | 6.8 | - |
| Om2 | 92-117 | 10YR2/1m | SFP | Mesic | 6 | <10 | 79.7 | 6.2 | - |
| Om3 | 117-220 | 7.5YR3/4m | SFP | Mesic | 6 | <10 | 56.9 | 5.7 | - |
| IICg | 220-274 | 5YR4/2m | LIM** | - | - | | 16.8 | 6.5 | - |
| IIICkg | 274-282 | 5GY4/1m | FSL | - | - | - | 2.6 | - | - |

**Limnic material is composed mainly of diatomaceous earth mixed with some marl.

# OD3 LANDSCAPE UNIT

## GENERALIZED PROFILE CHARACTERISTICS

| | |
|---|---|
| PARENT MATERIALS | Woody forest peat and woody sedge fen peat greater than 160 cm deep. |
| DRAINAGE | Very poor |
| USUAL CLASSIFICATION | Typic Mesisol |

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Peat Material and Texture | Stage of Decompostion | Organic Matter % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Om1 | 3 | 53 | - | - | - | - | - | WFP | Mesic | 48 | 6.2 | - |
| Om2 | 3 | 103 | - | - | - | - | - | WSFP | Mesic | 70 | 6.0 | - |
| Om3 | 3 | 235 | - | - | - | - | - | WSFP | Mesic | 54 | 6.1 | - |
| Om4 | 3 | 284 | - | - | - | - | - | WSFP | Mesic | 50 | 5.9 | - |
| IICkg | 2 | | - | - | - | - | - | LIM* | - | - | 7.4 | 47.8 |

*Limnic material is composed mainly of diatomaceous earth mixed with some marl

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### SOIL OF THE OD3 LANDSCAPE UNIT ONTARIO 1987 PROFILE NO. JWMG017

| | |
|---|---|
| LOCATION | Township of North Dorchester, Lot 11, Con. II, NTS Map Area 40I/14, 17TMT 9965 5610 |
| ELEVATION | 267 metres |
| SITE | Swamp |
| LANDFORM AND PARENT MATERIAL | Nearly level area of Dorchester swamp, mesic woody forest peat and woody sedge fen peat overlying limnic material |
| SLOPE | 1.0% simple |
| SOIL WATER REGIME | Very poorly drained, conductivity high, saturation period prolonged |
| STONINESS | Nonstony |
| CLASSIFICATION | Typic Mesisol |
| STATUS | High wood content in Om1 and Om2 horizons |

MORPHOLOGICAL DESCRIPTION, CHEMICAL AND PHYSICAL ANALYSES

| Horizon | Depth cm | Colour (moist) | Peat Material and Texture | Stage of Decomposition | von Post Scale | Woody Material Volume % | Organic Matter % | pH $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|
| Om1 | 0-29 | 10YR2/1m | WFP | Mesic | 5 | 40-50 | 67.1 | 6.8 | - |
| Om2 | 29-116 | 10YR2/2m | WFP | Mesic | 5 | 30-40 | 77.0 | 6.4 | - |
| Om3 | 116-155 | 7.5YR3/2m | WSFP | Mesic | 6 | 10-20 | 67.7 | 5.8 | - |
| Om4 | 155-185 | 5YR2.5/1m | WSFP | Mesic | 6 | 10-20 | 52.0 | 5.8 | - |
| Om5 | 185-200 | 10YR2/2m | WSFP | Mesic | 6 | 10-20 | 27.1 | 7.2 | - |
| Om6 | 200-223 | 10YR3/4m | WSFP | Mesic | 6 | 10-20 | 36.2 | 7.4 | - |
| IICkg | 223-250 | 100YR6/3m | LIM** | - | - | - | - | 7.5 | 47.8 |

** Limnic material is composed mainly of diatomaceous earth mixed with some marl

# OS1 LANDSCAPE UNIT

## GENERALIZED PROFILE CHARACTERISTICS

PARENT MATERIALS Dominantly mesic materials of various origin 40-160 cm deep overlying limnic or mineral material

DRAINAGE Very poor

USUAL CLASSIFICATION Terric Mesisol, occasionally Terric Mesisol (limnic phase*) or Terric Humic Mesisol

* Limnic phase on Terric Mesisols in Middlesex County indicates that at least part of the mineral layer, 25 cm thick, occurring in the middle or bottom tier of the profile, is either diatomaceous earth or marl

MEAN HORIZON VALUES

| Horizon | No. of Samples | Depth to Horizon Base (cm) | Gravel % | Sand % | VF Sand % | Silt % | Clay % | Peat Material and Texture | Stage of Decompostion | Organic Matter % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Om1 | 18 | 56 | | - | - | - | - | SFP | Mesic | 61 | 6.1 | - |
| Om2 | 12 | 79 | - | - | - | - | - | SFP | Mesic | 57 | 5.7 | - |
| Om3 | 7 | 95 | - | - | - | - | - | WSFP | Mesic | 60 | 6.0 | - |
| IICkg | 6 | 133 | - | - | - | - | - | LIM** | - | 20 | 7.4 | - |
| IIICkg | 4 | | 1 | 16 | 10 | 60 | 24 | SIL | - | 6 | 7.4 | 29.9 |

**Limnic material is composed mainly of diatomaceous earth mixed with some marl

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### SOIL OF THE OS1 LANDSCAPE UNIT ONTARIO 1987 PROFILE NO. JWMG004

LOCATION Township of East Williams, Lot 14, Con. XVIII, NTS Map Area 40P/3, 17TMT 5133 7584

ELEVATION 229 metres

SITE Drained swamp

LANDFORM AND PARENT MATERIALS Nearly level swamp which has been extensively drained, mesic woody forest peat and sedge fen peat overlying limnic and mineral material

SLOPE 0.5 % simple

SOIL WATER REGIME Very poorly drained, conductivity high, saturation period prolonged

STONINESS Nonstony

CLASSIFICATION Terric Mesisol (limnic phase)

STATUS Typical

MORPHOLOGICAL DESCRIPTION, CHEMICAL AND PHYSICAL ANALYSES

| Horizon | Depth cm | Colour (moist) | Peat Material and Texture | Stage of Decomposition | von Post Scale | Woody Material Volume % | Organic Matter % | pH $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|
| Om1 | 0-47 | 10YR2/1m | WFP | Mesic | 5 | 20-30 | 49.2 | 6.4 | - |
| Om2 | 47-57 | 10YR3/2m | SFP | Mesic | 5 | | 39.3 | - | - |
| Om3 | 57-74 | 2.5Y4/2m | SFP | Mesic | 5 | | 29.6 | 7.4 | - |
| IICg | 74-85 | 5Y4/2m | LIM** | - | - | - | 22.8 | - | - |
| IICkg | 85-110 | 5Y5/2m | LIM** | - | - | - | 11.7 | 7.1 | 14.2 |
| IIICkg | 110-151 | 5Y5/1m | SIL | - | - | - | 0.5 | 7.5 | 43.0 |

**Limnic material is composed mainly of diatomaceous earth in the IICg horizon, and diatomaceous earth mixed with some marl in the IICkg horizon

# OS2 LANDSCAPE UNIT

## GENERALIZED PROFILE CHARACTERISTICS

PARENT MATERIALS — Dominantly humic organic material of various origin 40-160 cm deep overlying mineral material

DRAINAGE — Very poor

USUAL CLASSIFICATION — Terric Humisol, occassionally Terric Humisol (limnic phase)* and Teric Mesic Humisol

* Limnic phase on Terric Humisols in Middlesex County indicates that at least part of the mineral layer, 25 cm thick, occurring in the middle or bottom tier of the profile, is either diatomaceous earth or marl

MEAN HORIZON VALUES

| Horizon | No. of Samples | Horizon Base (cm) | Depth to Gravel % | Sand % | VF Sand % | Silt % | Clay % | Peat Material and Texture | Stage of Decompostion | Organic Matter % | pH in $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oh1 | 7 | 37 | - | - | - | - | - | WSFP | Humic | 52 | 6.2 | - |
| Oh2 | 6 | 71 | - | - | - | - | - | SFP | Humic | 65 | 5.5 | - |
| Om | 5 | 76 | - | - | - | - | - | WSFP | Mesic | 58 | 5.4 | - |
| IICkg | 7 | | 0 | 53 | 17 | 37 | 11 | L | - | - | 7.3 | 28.0 |

## DETAILED PROFILE DESCRIPTIONS AND ANALYSES

### SOIL OF THE OS2 LANDSCAPE UNIT ONTARIO 1987 PROFILE NO. JWMG048

LOCATION — Township of North Dorchester, Lot 15, Con. II, NTS Map Area 40I/14, 17TMT 9771 5450

ELEVATION — 281 metres

SITE — Swamp

LANDFORM AND PARENT MATERIALS — Swamp formed in a depressional area, woody sedge fen peat and sedge fen peat overlying limnic material

SLOPE — 1.0% simple

SOIL WATER REGIME — Very poorly drained, conductivity high, saturation period prolonged

STONINESS — Nonstony

CLASSIFICATION — Terric Humisol (limnic phase)

STATUS — Limnic material is much deeper than usual

MORPHOLOGICAL DESCRIPTION, CHEMICAL AND PHYSICAL ANALYSES

| Horizon | Depth cm | Colour (moist) | Peat Material and Texture | Stage of Decomposition | von Post Scale | Woody Material Volume % | Organic Matter % | pH $CaCl_2$ | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|
| Oh1 | 0-21 | 10YR2/1m | | Unidentifiable Humic | 9 | | 28 | 6.1 | - |
| Oh2 | 21-60 | 10YR2/1m | WSFP | Humic | 7 | | 68 | 6.2 | - |
| Om | 60-76 | 10YR2/2m | SFP | Mesic | 6 | | 42 | 7.4 | - |
| IICkg1 | 76-185 | 10YR6/3m | LIM** | - | - | - | 9.6 | 7.5 | 50.1 |
| IICkg2 | 185-250 | 5Y5/4m | LIM** | - | - | - | 24.1 | 7.4 | 68.2 |

**Limnic material is composed mainly of diatomaceous earth mixed with some marl.

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# APPENDIX

## Variability of Surface Textures in the Soils of Middlesex County

# Introduction

The variability of the texture of surface horizons can be an important consideration in land management decisions. As a result, the particle size distribution data determined from samples of surface horizons is presented in graphical format for most soil association members. These diagrams provide a quick overview of the range in textures which are likely to occur within Middlesex County, for each association member.

The diagrams are arranged alphabetically by soil association. Three triangles are shown on each page, one for each association member. The triangle for the best-drained member is located in upper left part of the page and the imperfectly drained member is situated in the upper right portion of the page. The poorly drained member appears in the bottom and centre of the page.

The total sand and clay content from the sampled surface horizons of each association member were plotted on the appropriate triangle. The lines on the triangles separate the textural classes according to the *CanSIS Manual for Describing Soils in the Field* (5). The triangle entitled Soil Texture Classes is provided as a reference for the class names. The textural classes listed are those used in the soil report, except for sandy loam, sand and loamy sand. Although each of these classes is subdivided in the original data base, according to the size of the dominant sand fraction (e.g. very fine sandy loam, fine sandy loam, sandy loam, coarse sandy loam), these differences cannot be shown on the textural triangle. The dominant and mean sand-sized fractions are, however, included in Volume 1 in the soil descriptions and in the tables of Volume 2.

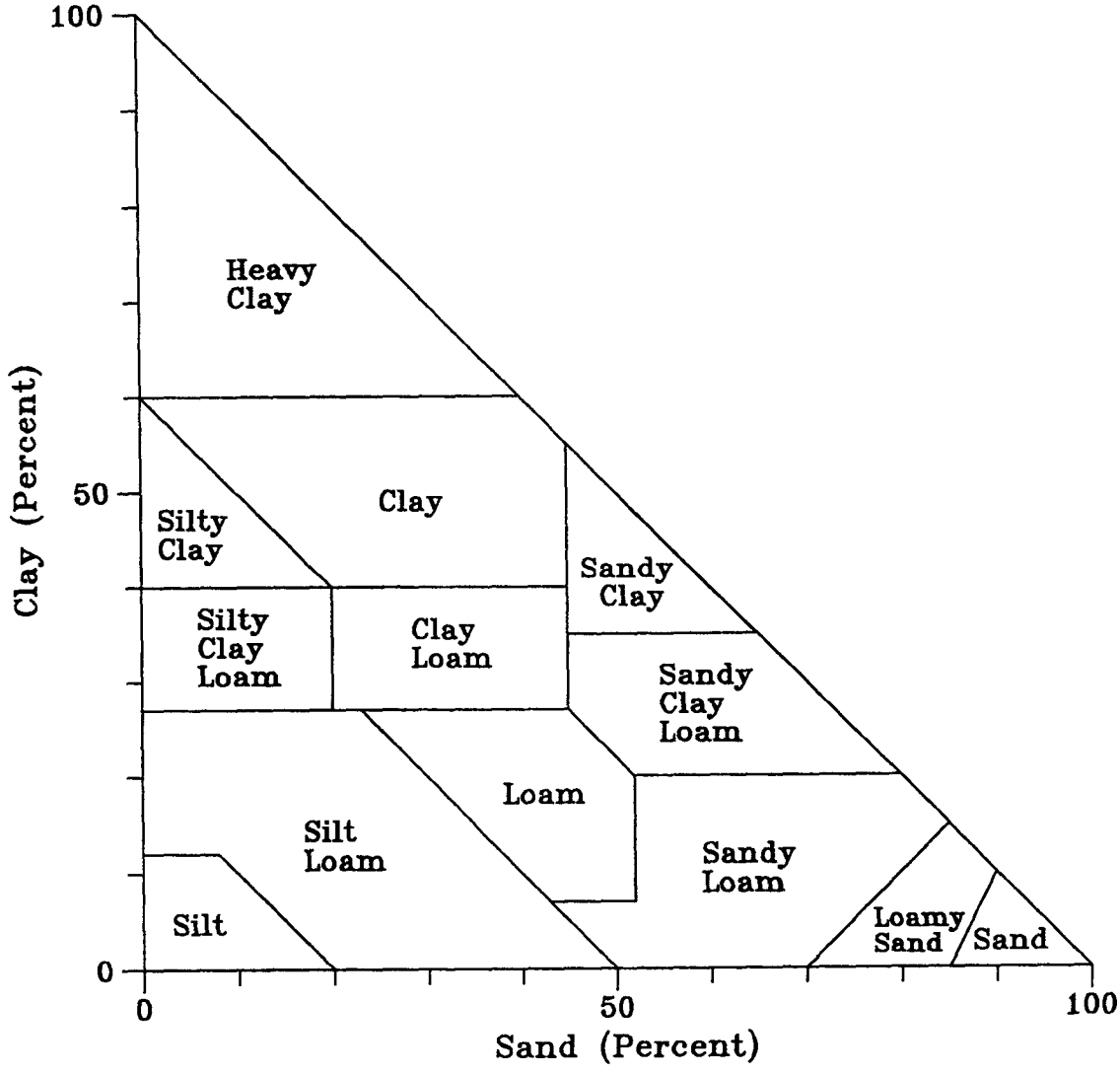
### Variability of Surface Texture

A review of the triangles suggests that some soils have a relatively narrow range of surface textures. For example, in the Plainfield Association, most of the points are clustered within the loamy sand and sand textural classes. The soil descriptions in Volume 1 and the Generalized Profile Characteristics summarized in Volume 2 indicate that the dominant textures are fine sand and loamy fine sand.

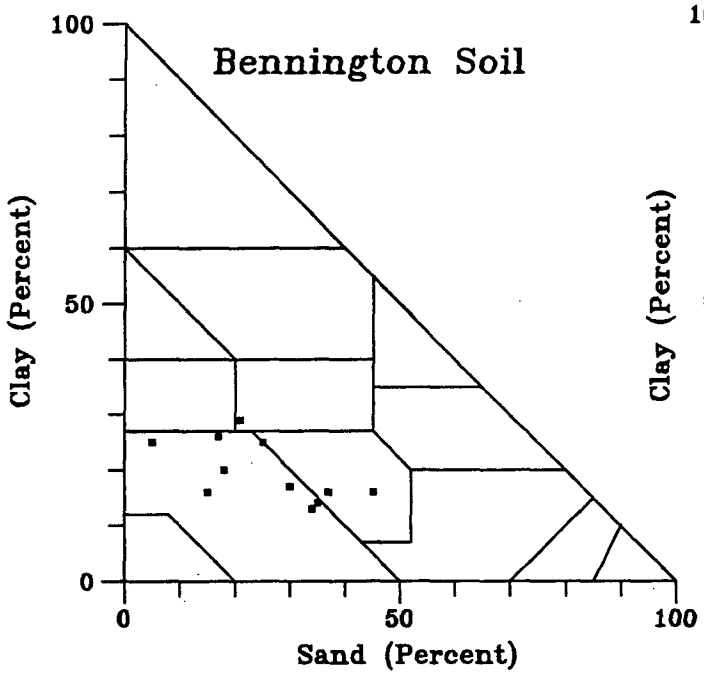
Some of the variability in the texture of surface soil horizons is due to changes in the depositional environment in which the soil materials originated. For example, Brant Association soils were often mapped in transitional areas between glaciolacustrine clay plains and shallow water glaciolacustrine sand deposits. As a consequence, the surface textures are highly variable, and include sandy loam, silt loam, loam, clay loam and silty clay loam.

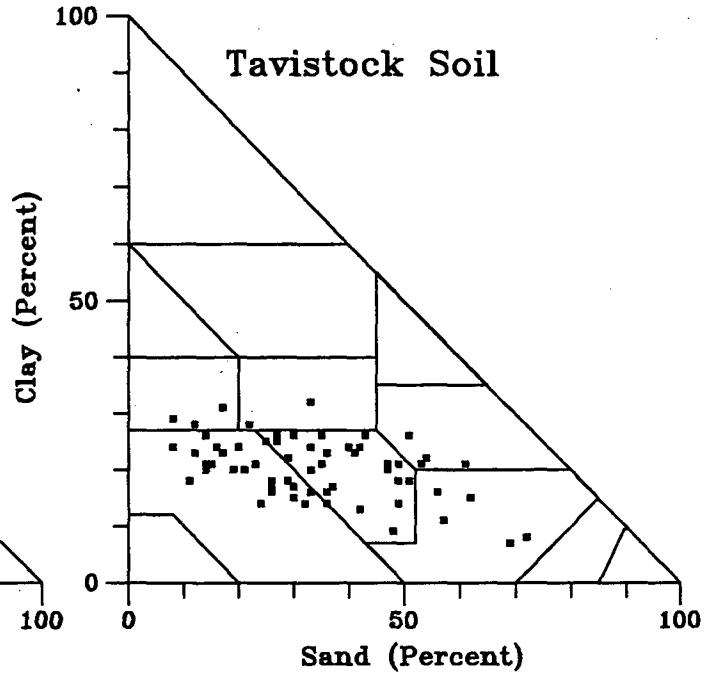
The variability is also a result of the mapping system used in Middlesex County, because soils with a contrasting surface texture were not given a separate designation, unless the depth of the upper material was at least 40 cm.

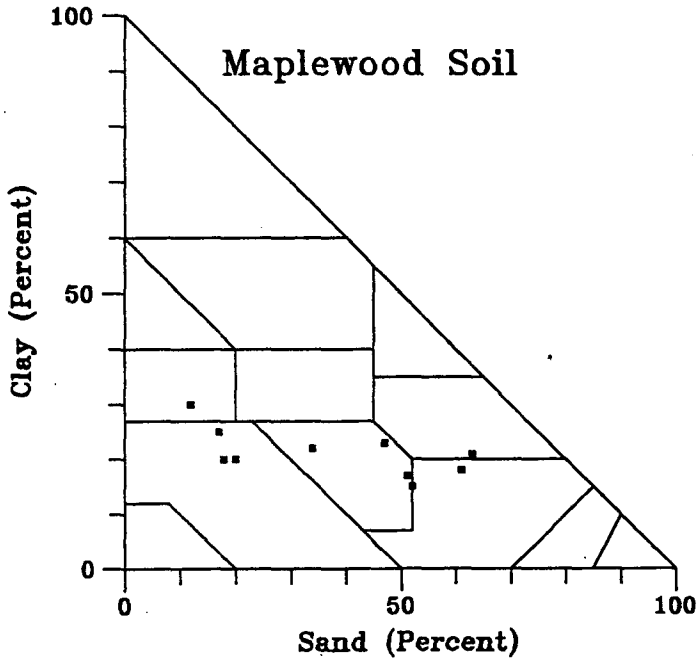
## Soil Texture Classes



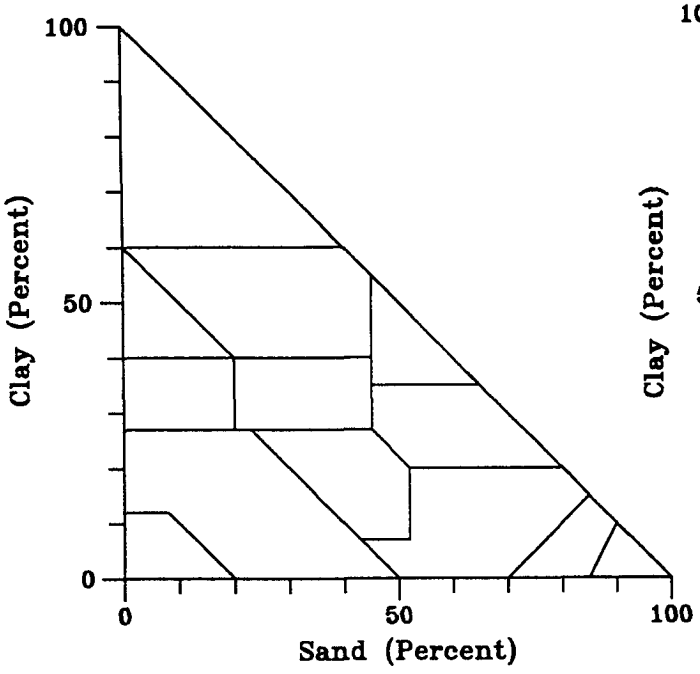
# Bennington Association

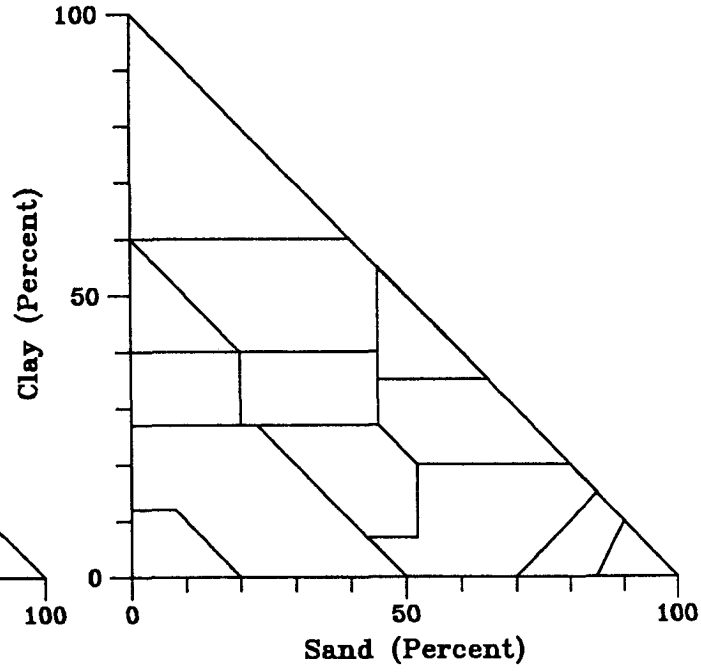


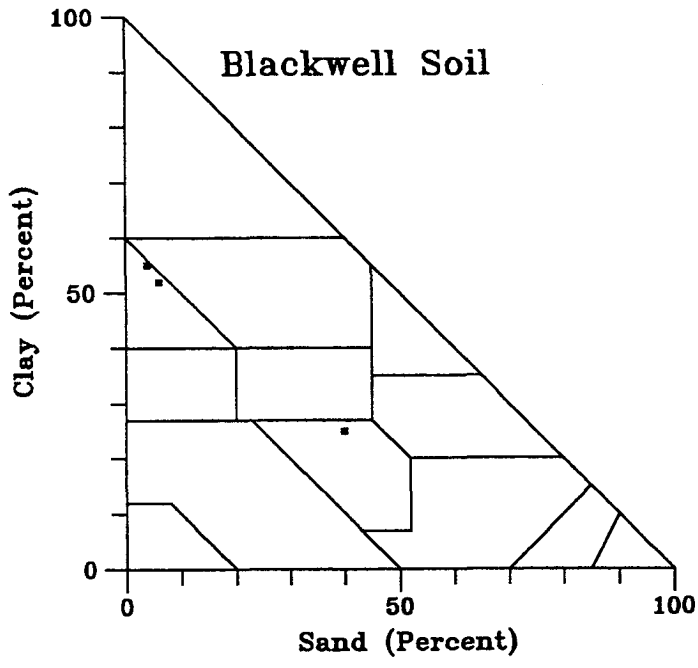



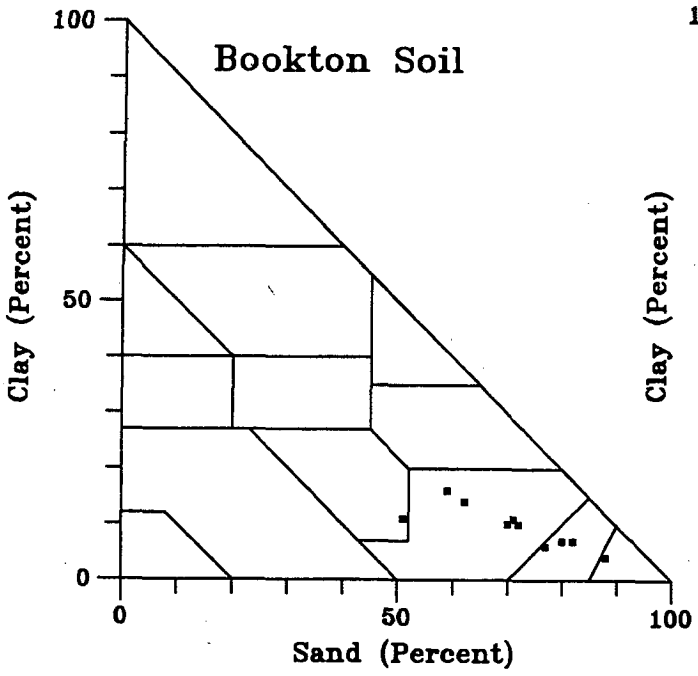
# Blackwell Association

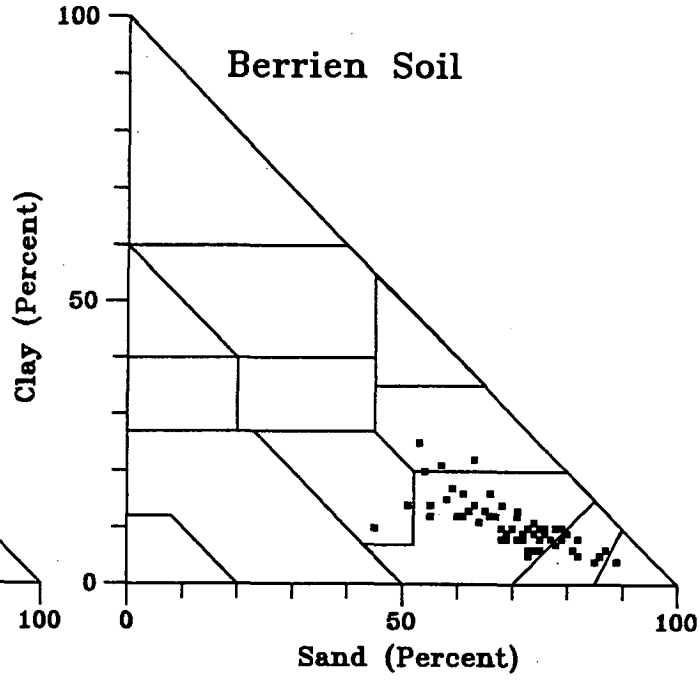


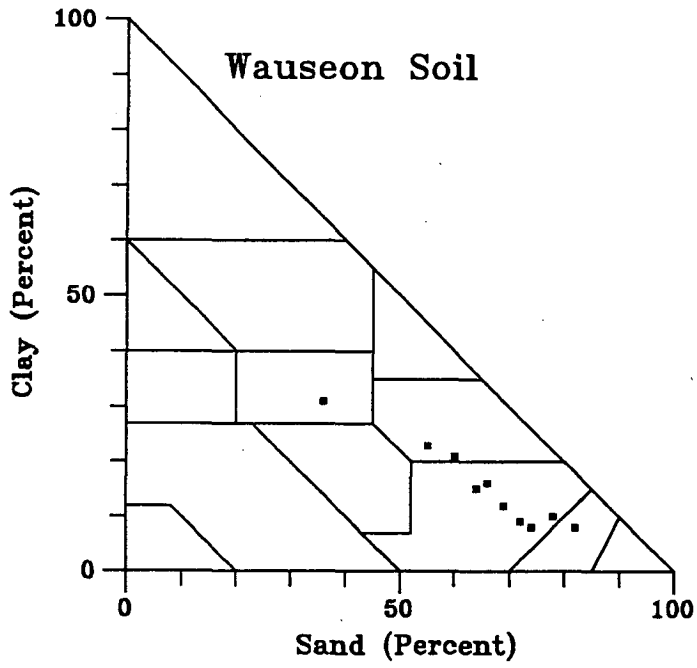



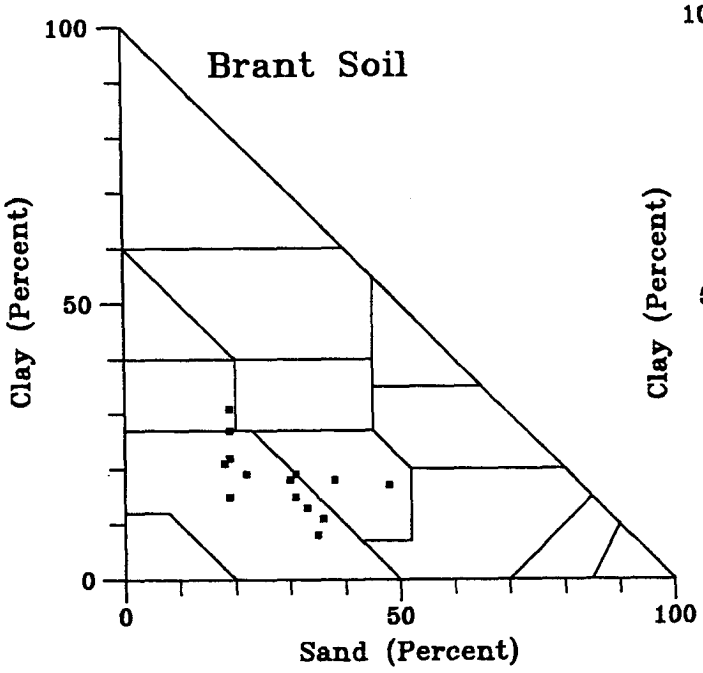
# Bookton Association

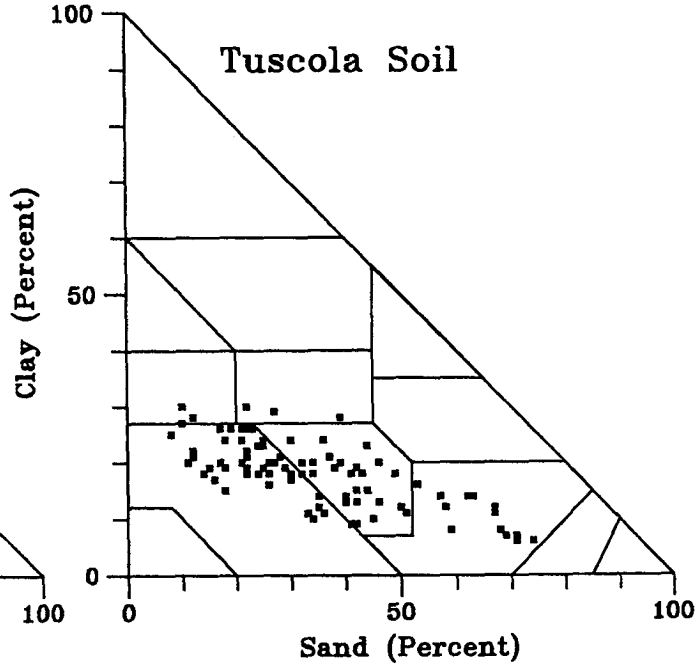


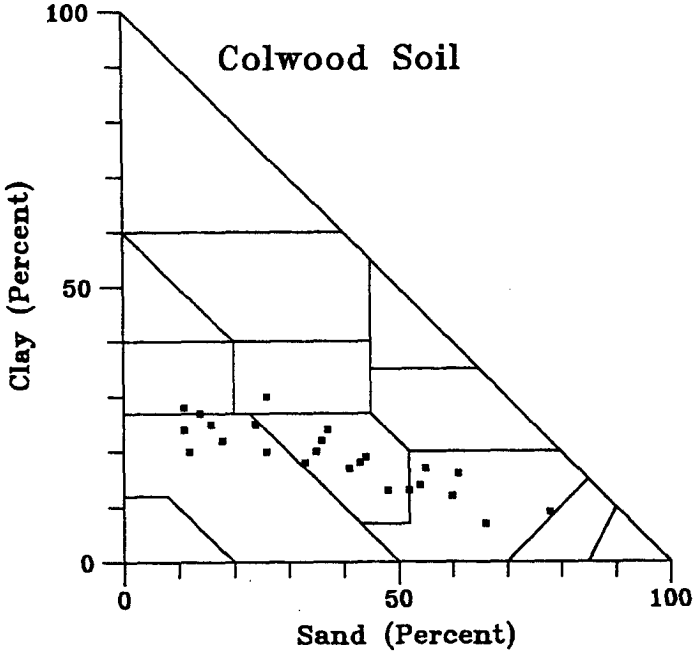



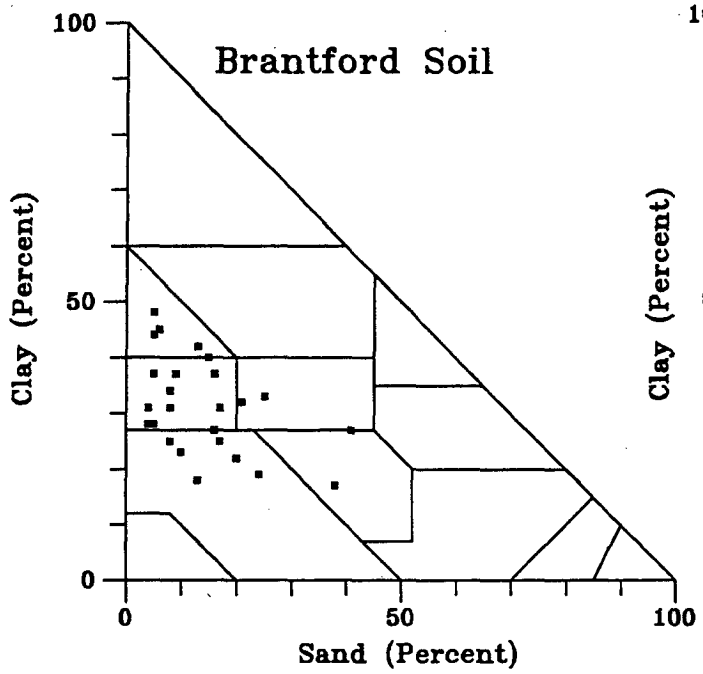
# Brant Association

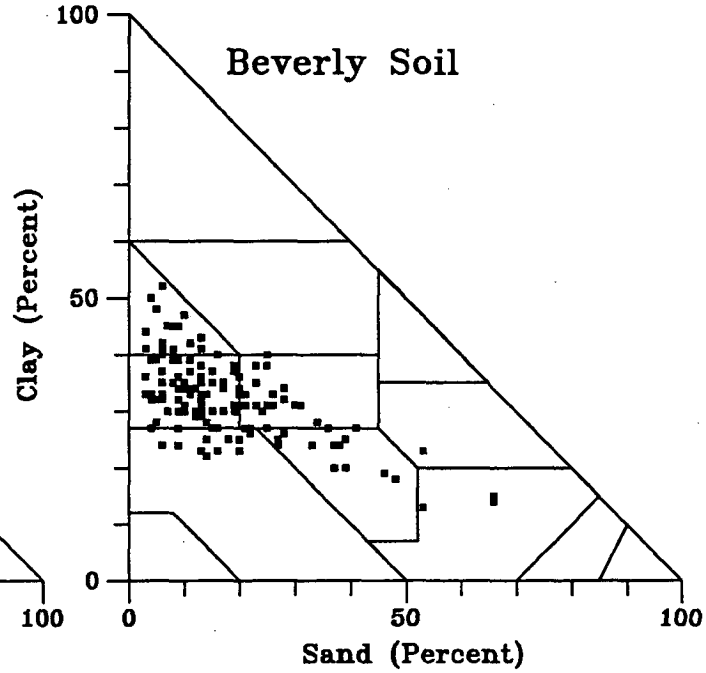


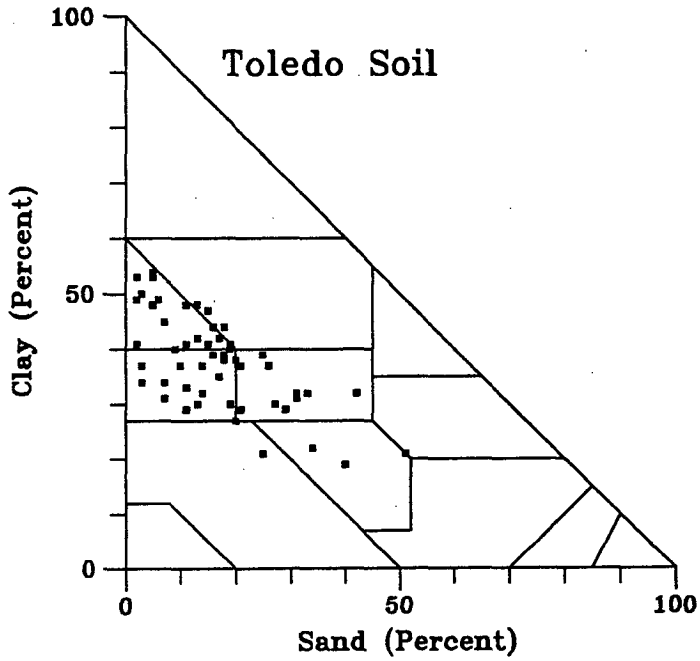



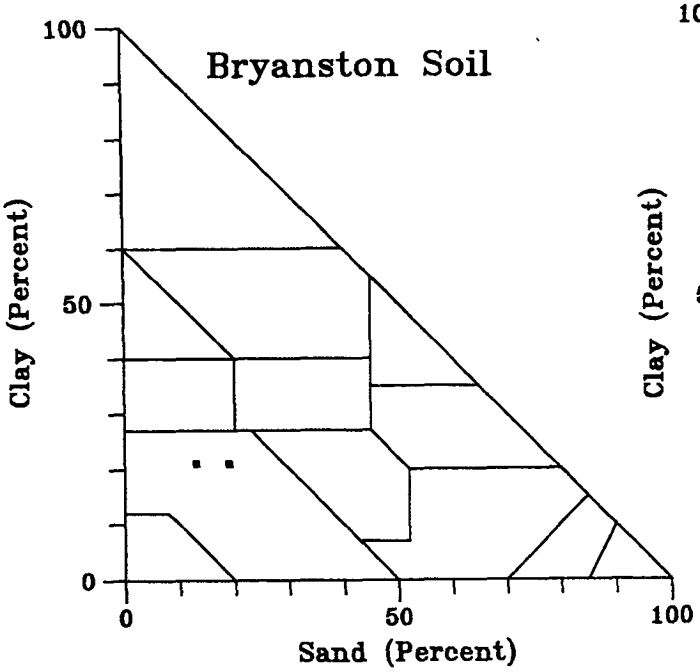
# Brantford Association

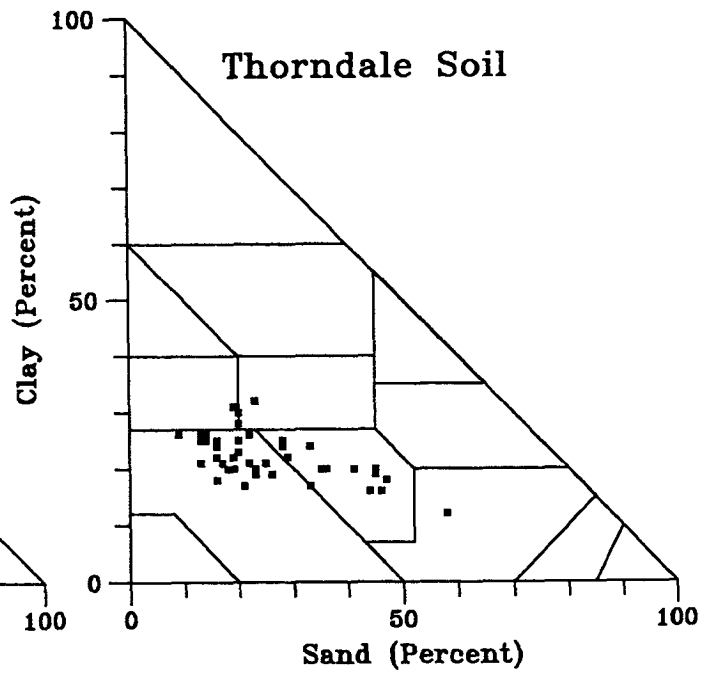


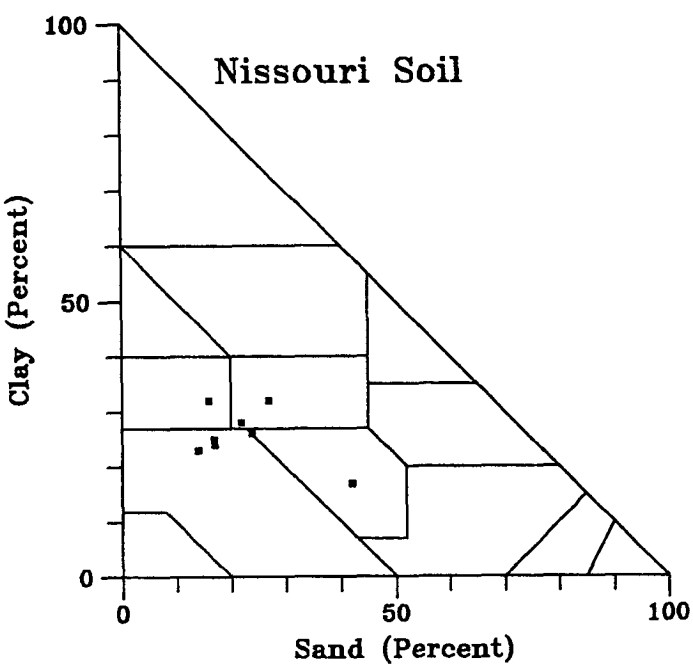



# Bryanston Association



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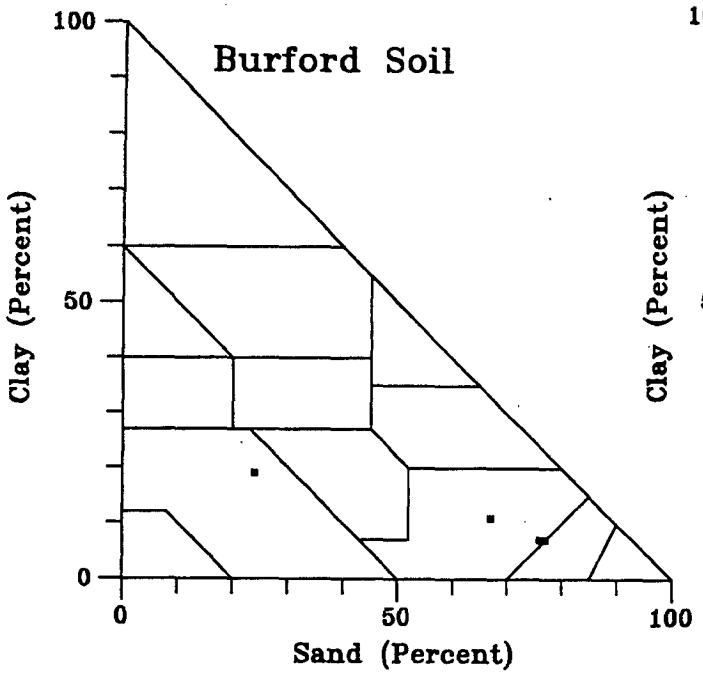


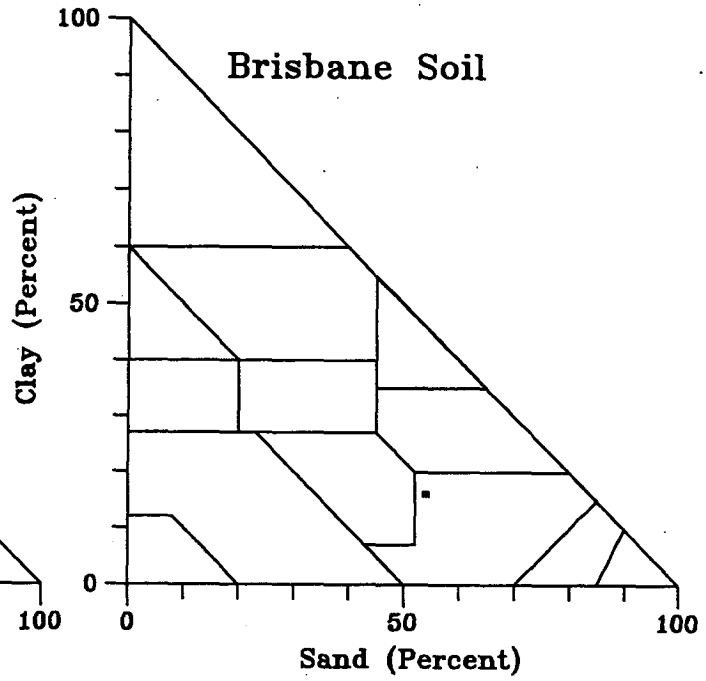


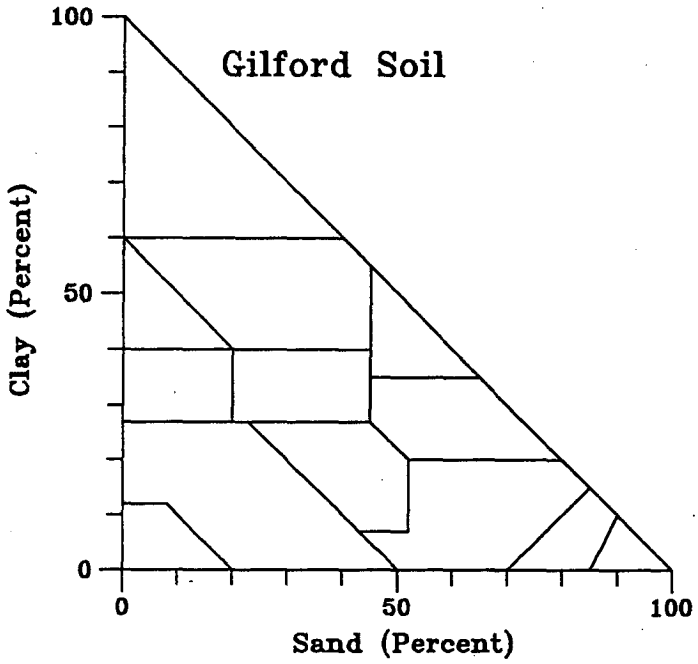

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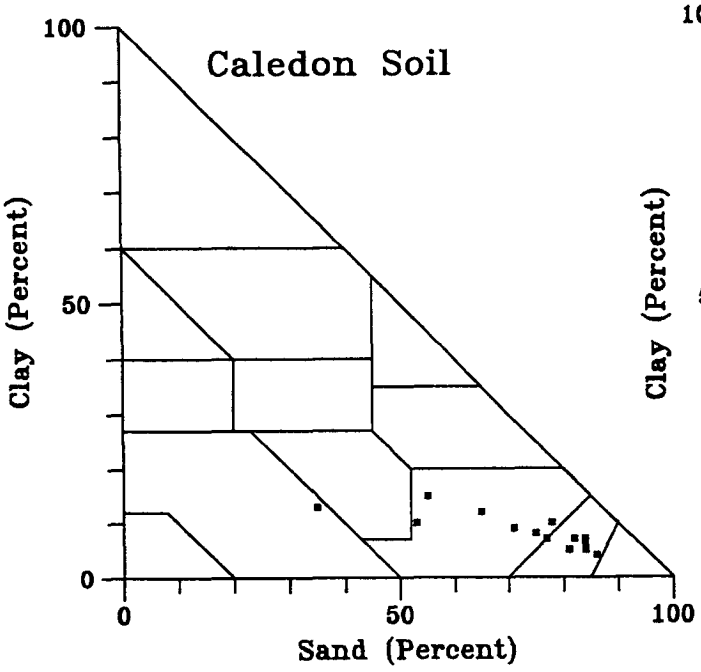


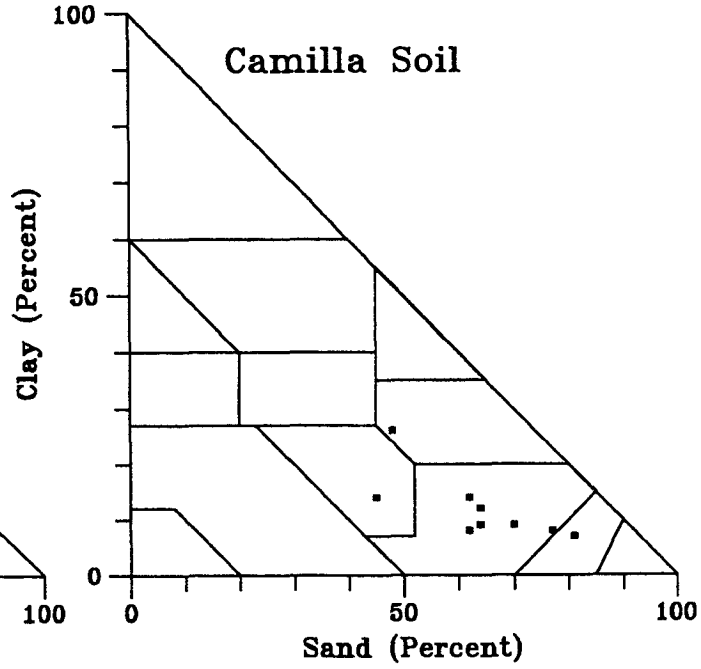


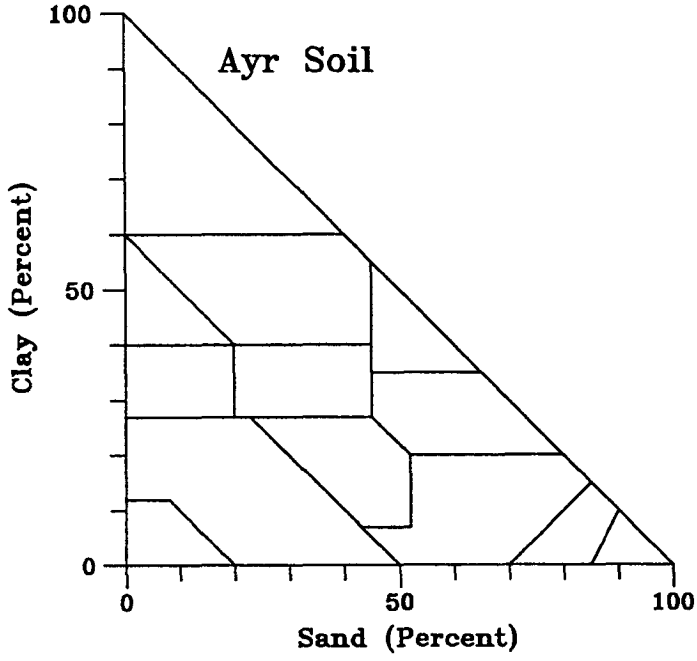

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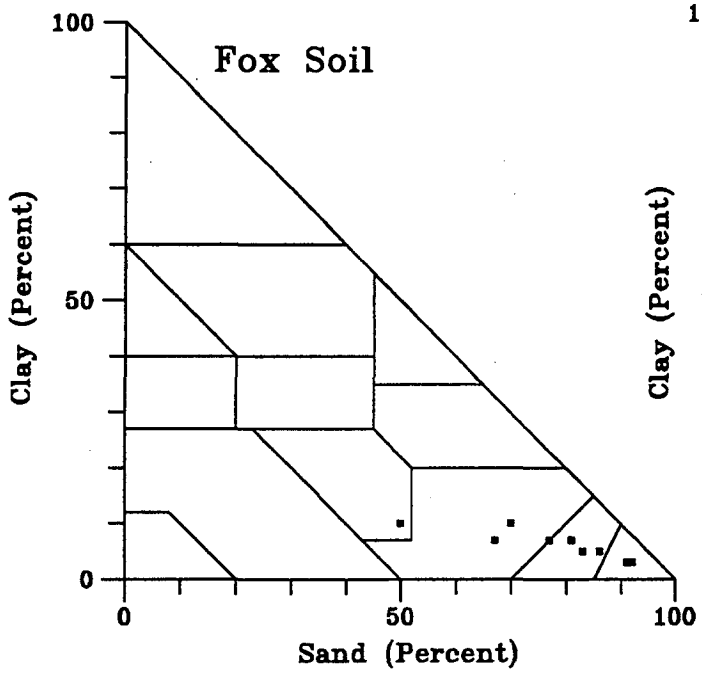


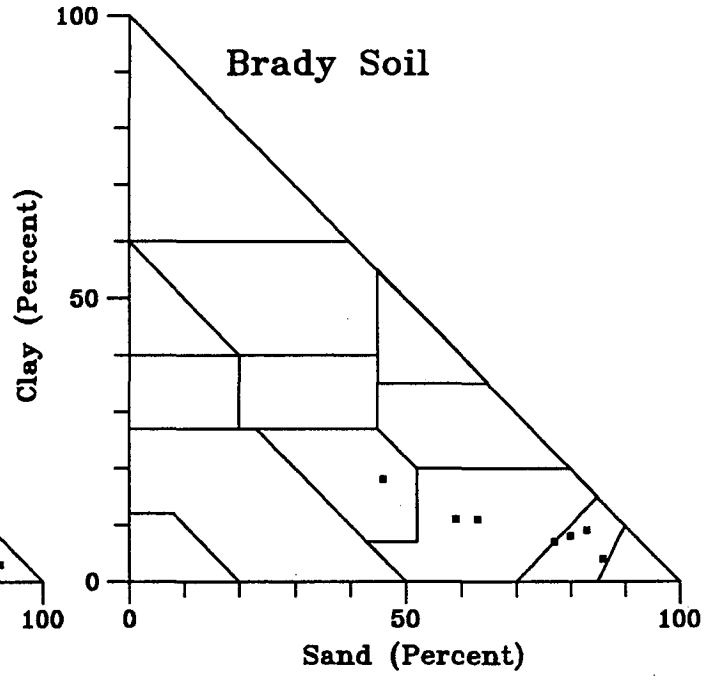


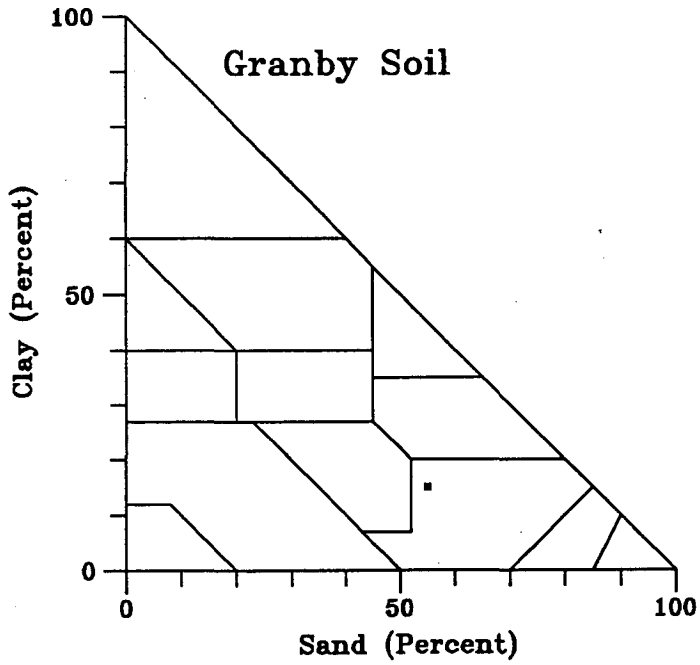

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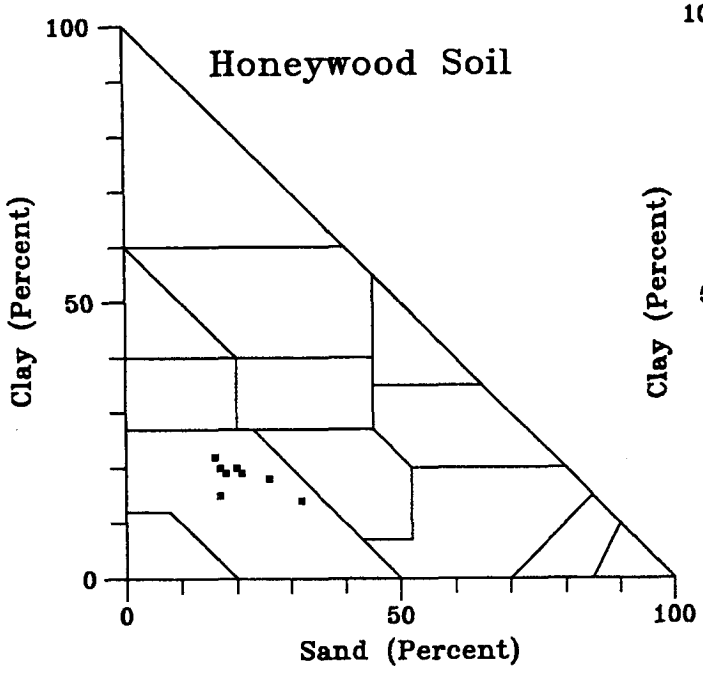


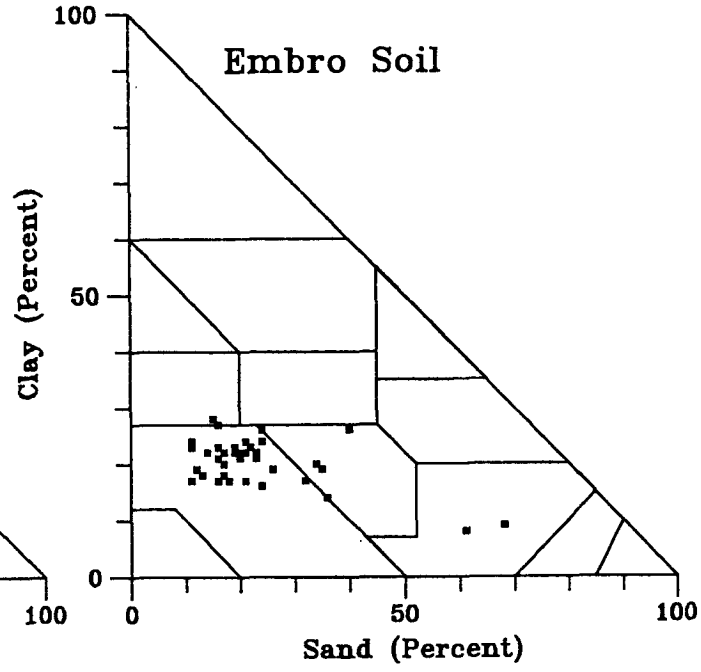


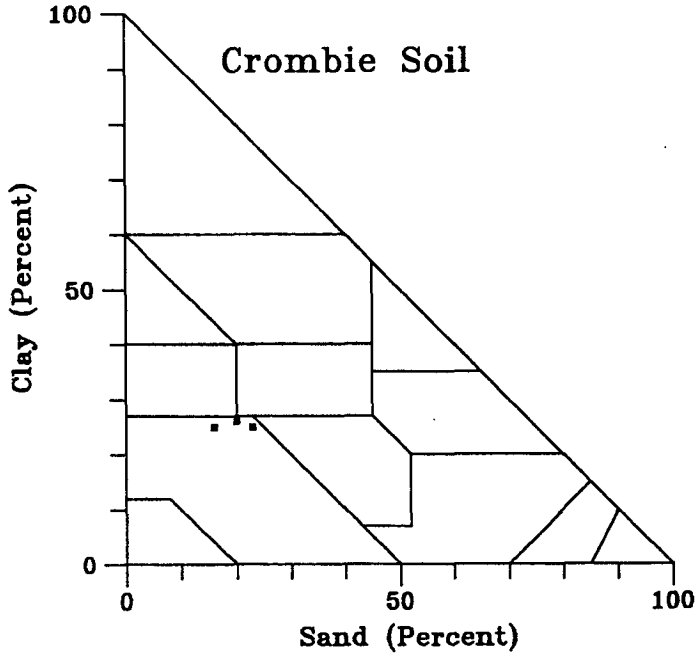

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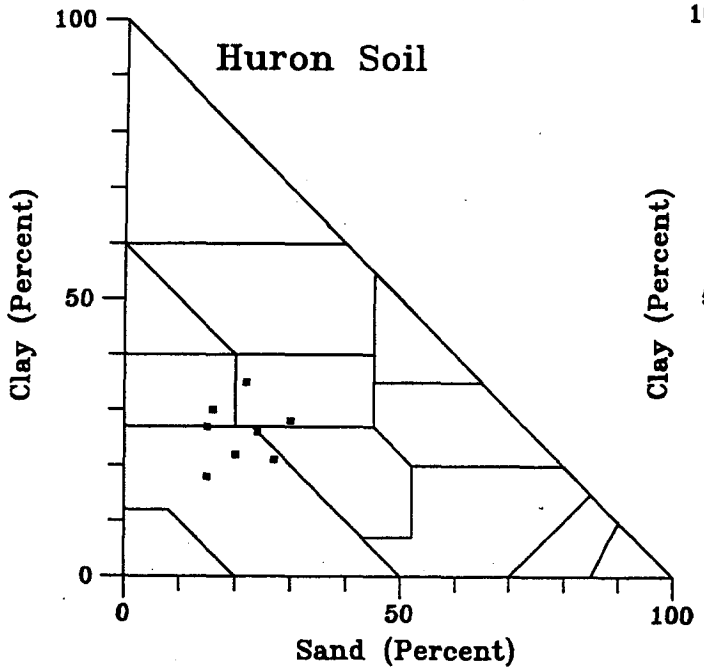
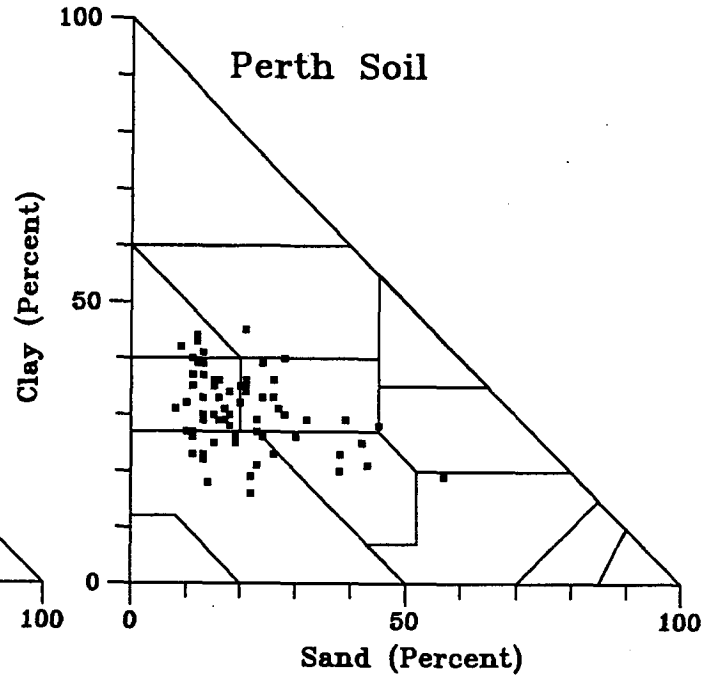
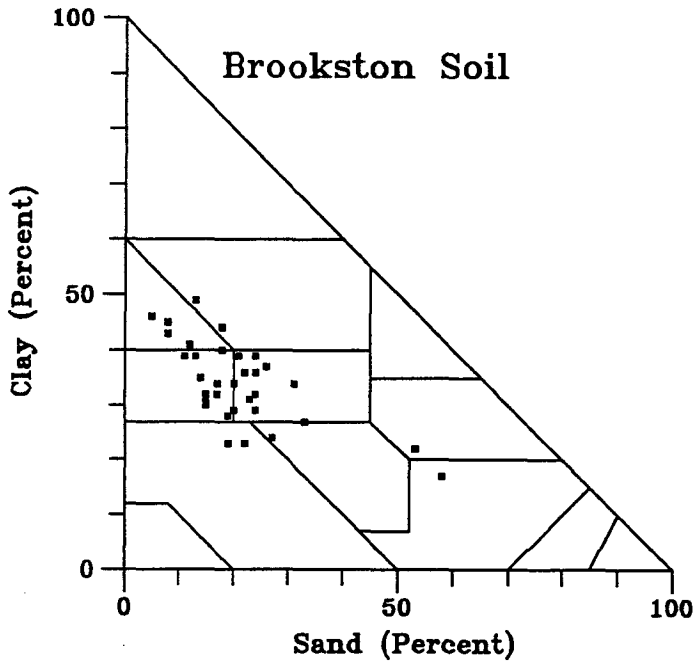
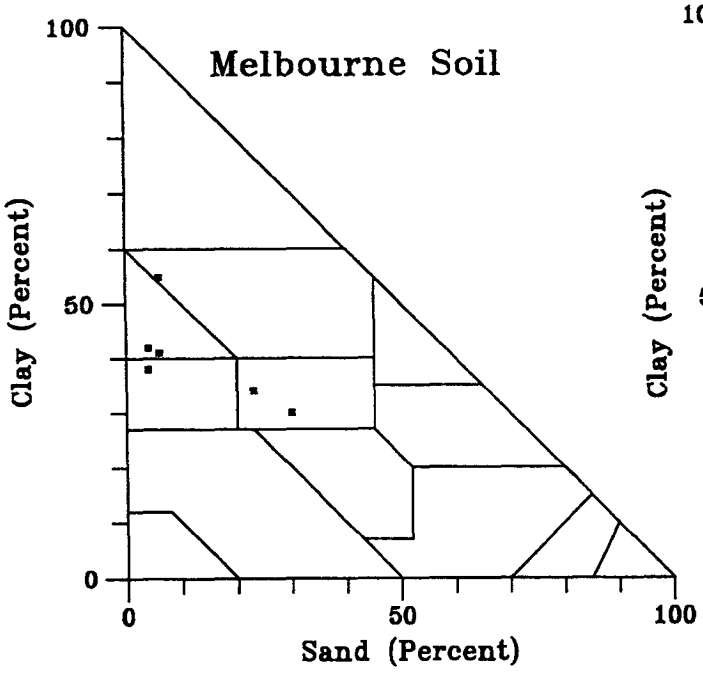
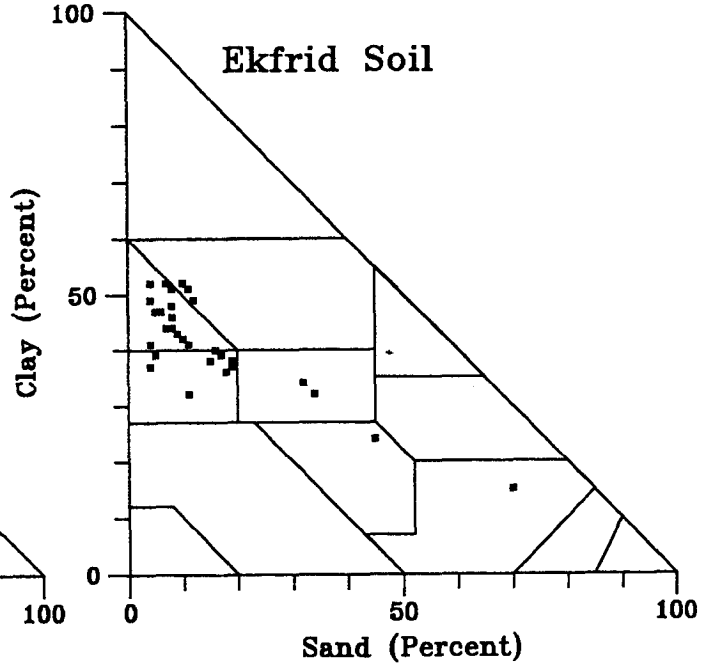


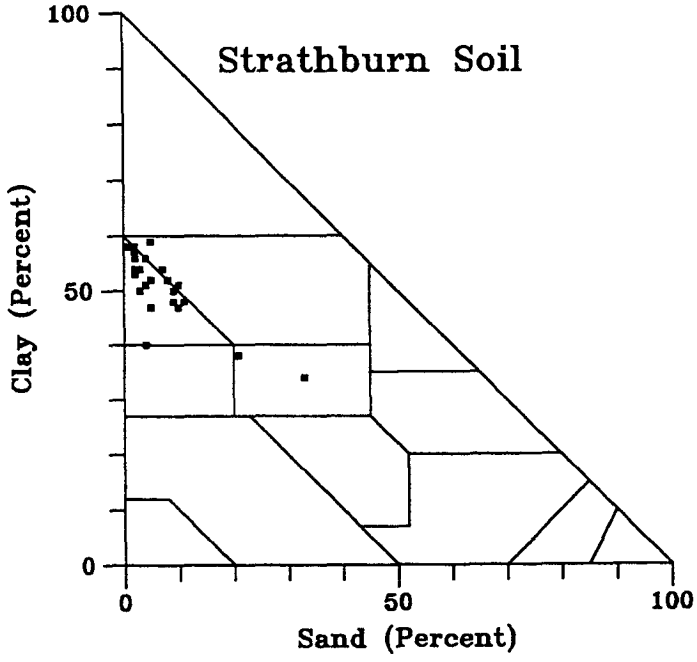



# Melbourne Association



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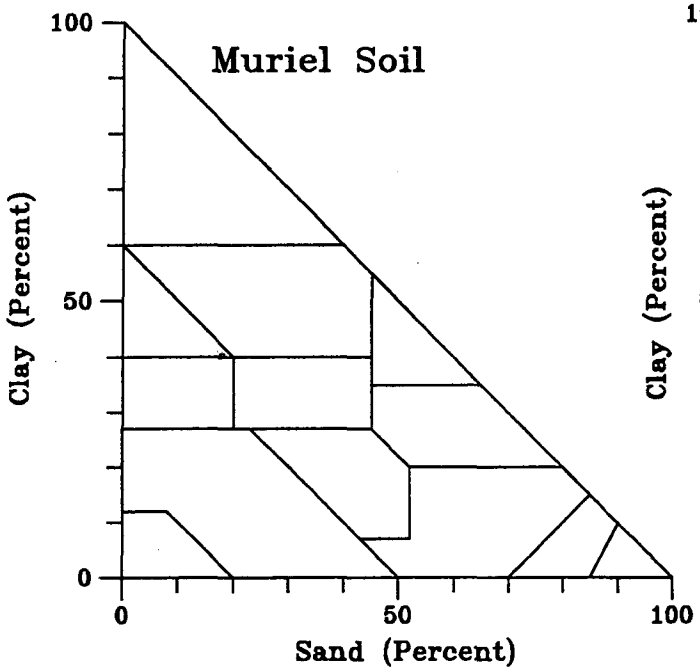
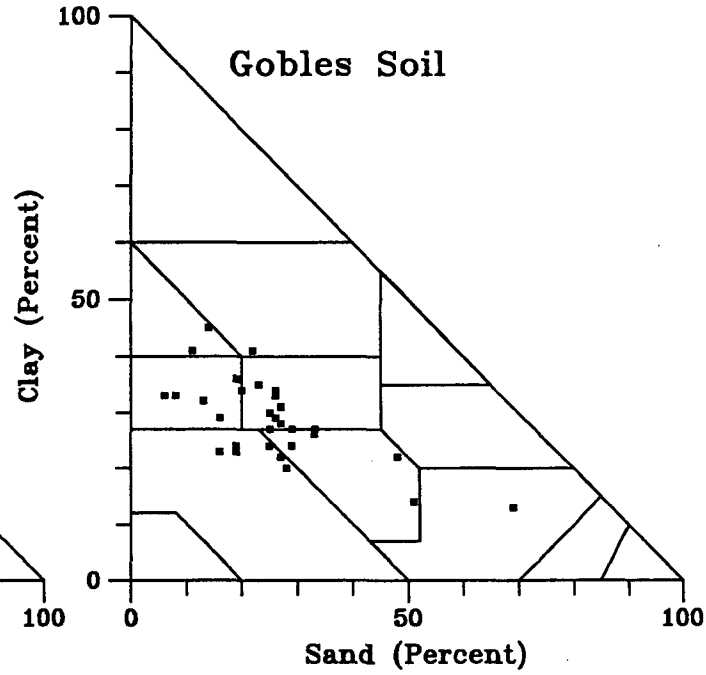
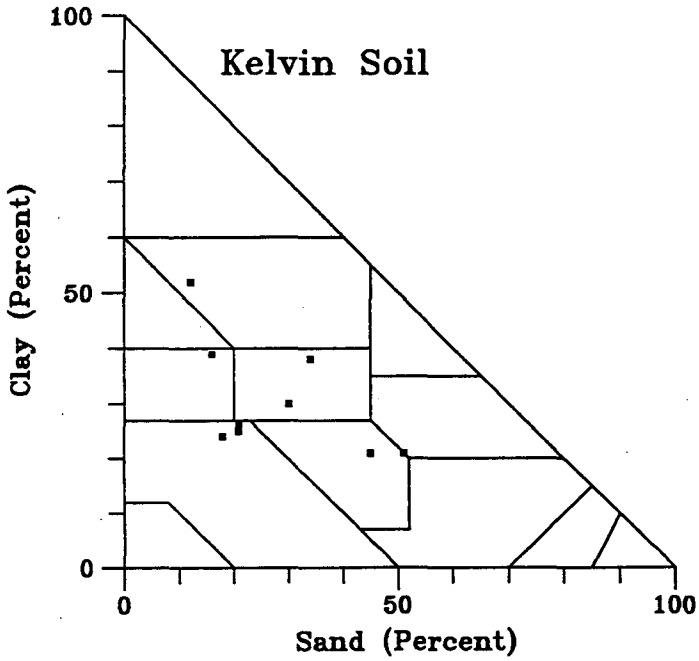
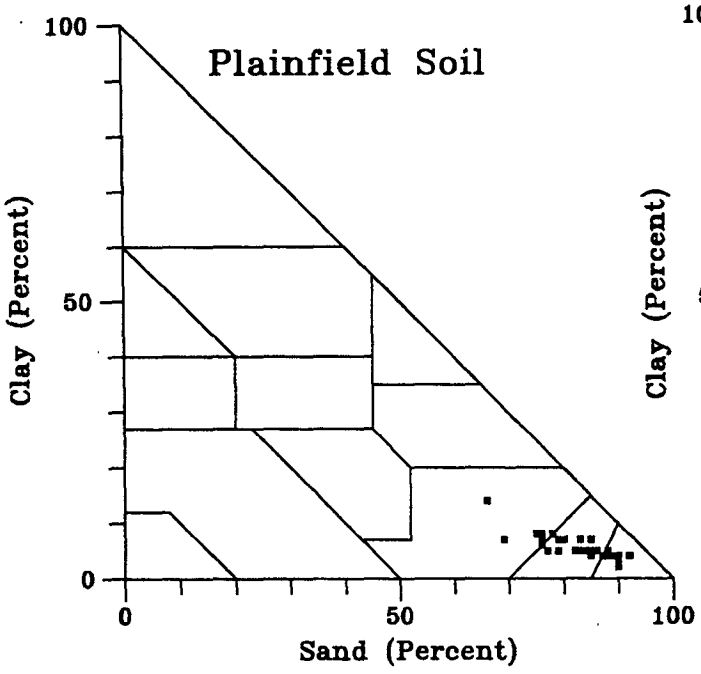
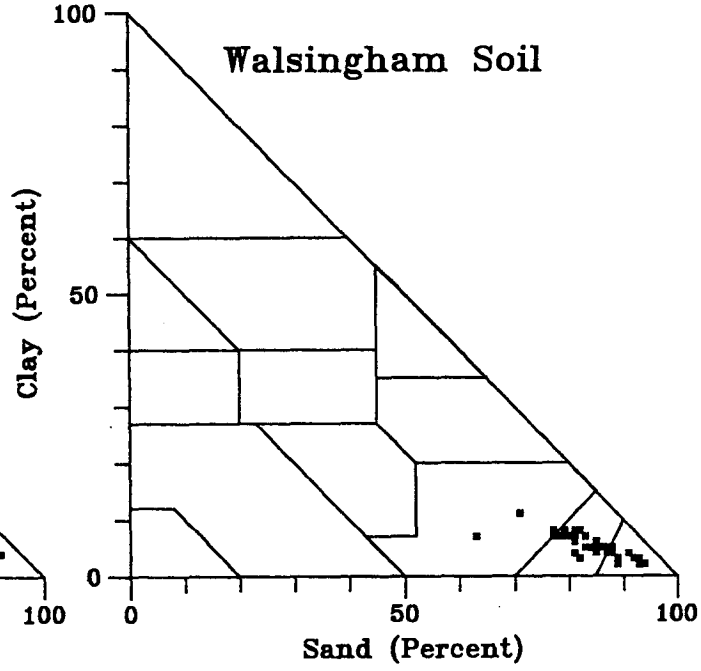


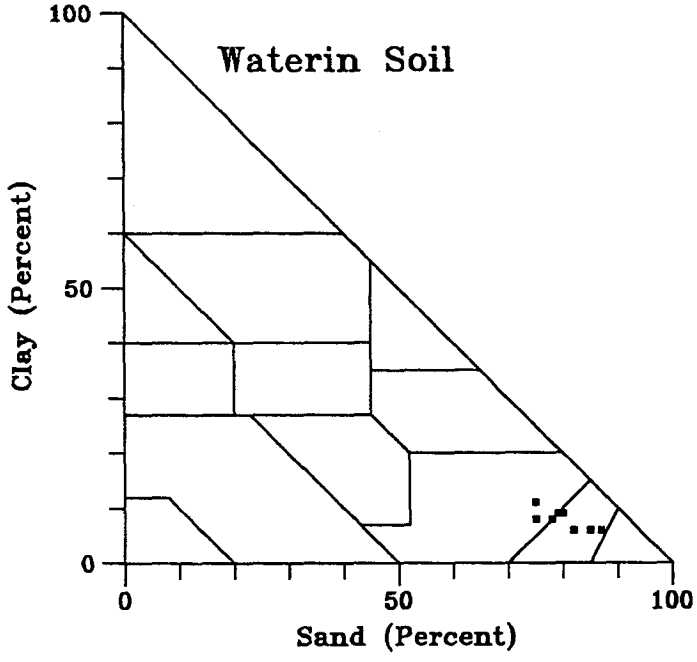



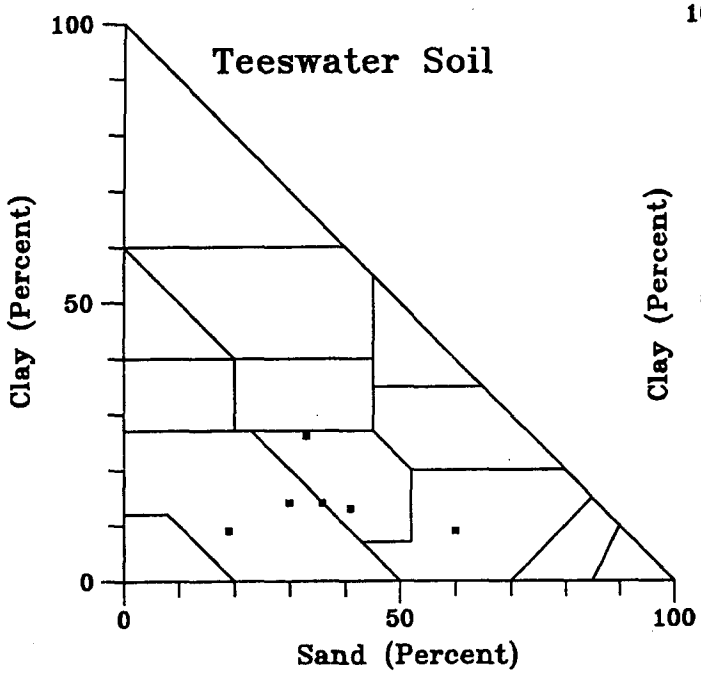
# Plainfield Association

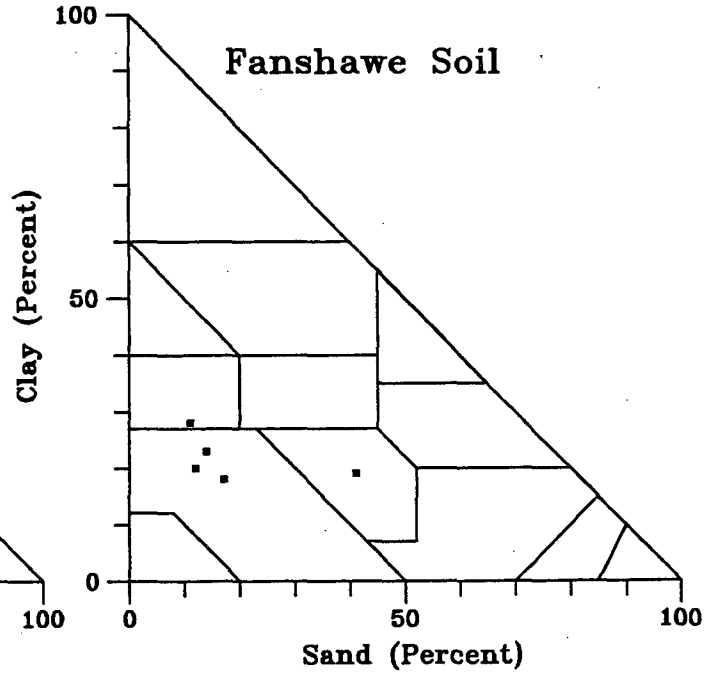


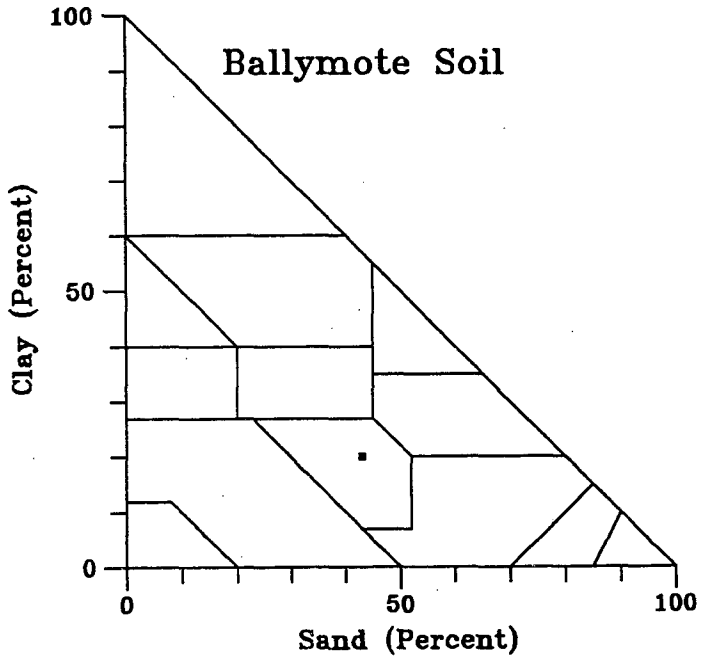



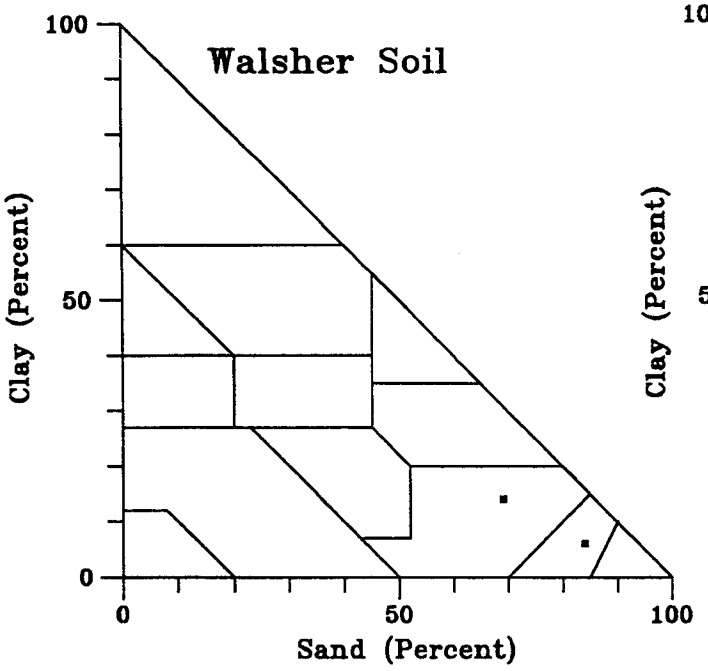
# Teeswater Association

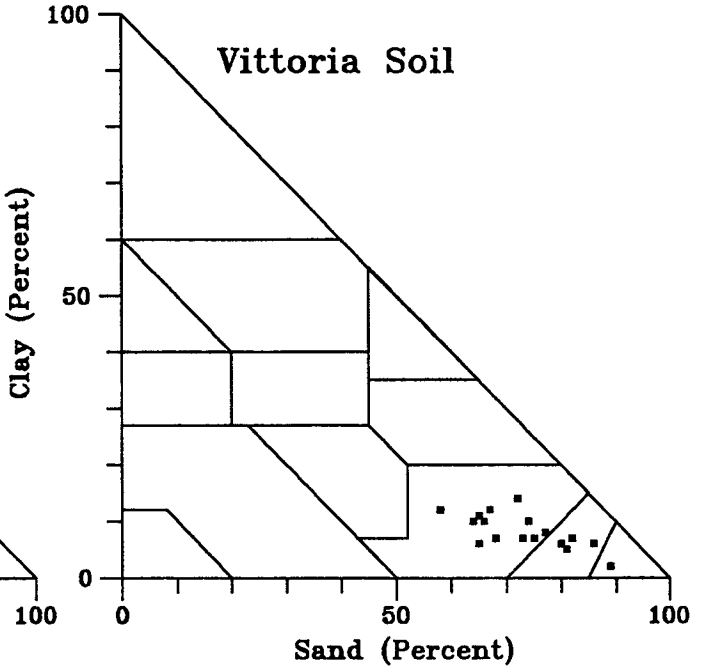


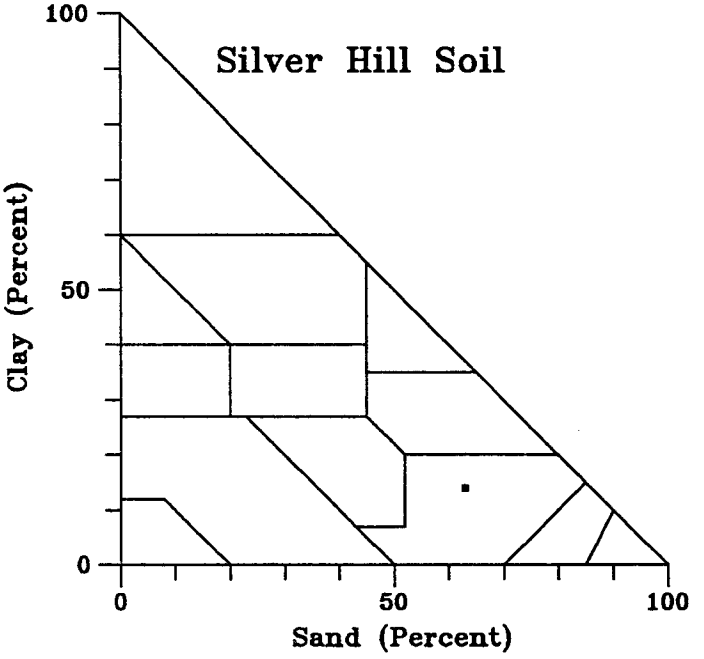



# Walsher Association



# Wattford Association