

2-1-1969

TB34: Chemical and Physical Properties of the Charlton, Sutton, Paxton, and Woodbridge Soil Mapping Units

R. V. Rourke

C. Beek

Follow this and additional works at: https://digitalcommons.library.umaine.edu/aes_techbulletin

 Part of the [Soil Science Commons](#)

Recommended Citation

Rourke, R.V., and C. Beek. 1969. Chemical and physical properties of the Charlton, Sutton, Paxton, and Woodbridge soil mapping units. Maine Agricultural Experiment Station Technical Bulletin 34.

This Article is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in Technical Bulletins by an authorized administrator of DigitalCommons@UMaine. For more information, please contact um.library.technical.services@maine.edu.

**CHEMICAL AND PHYSICAL PROPERTIES OF THE
CHARLTON, SUTTON, PAXTON AND
WOODBRIIDGE SOIL SERIES**

R. V. Rourke

and

C. Beek

SPECIFIC INFORMATION FOR
HIGHWAY ENGINEERING
URBAN DEVELOPMENT PLANNING
WATERSHED MANAGEMENT
AGRICULTURAL SOIL AND WATER MANAGEMENT

TECHNICAL BULLETIN 34 FEBRUARY 1969

MAINE AGRICULTURAL EXPERIMENT STATION
ORONO

ACKNOWLEDGMENTS

The authors wish to recognize the others who have assisted in this study. This research was supported in part by funds provided by the United States Department of Interior as authorized under the Water Resources Research Act of 1964, Public Law 88-379.

We are most appreciative of the aid given by Mr. Walter Steputis, Mr. Bryce McEwen and Mr. Albert Faust of the Soil Conservation Service, U.S.D.A. Without their help in selecting the sites and writing the profile descriptions, this study would have been most difficult.

The assistance provided by Dr. Eliot Epstein and Mr. Walter Grant of the Agricultural Research Service in making their laboratory facilities available for this and previous studies has been most generous. Mrs. Florence Wittner aided greatly by determining the exchangeable bases present in the soil extracts.

We also acknowledge the efforts of Mrs. Ninette Jameson and Mrs. Catherine Bradbury in typing the manuscript.

TABLE OF CONTENTS

SUMMARY	II
INTRODUCTION	1
PROCEDURE	3
RESULTS AND DISCUSSION	4
Particle Size Distribution .	4
Coarse Fragment Volume	8
Organic Carbon	9
Water Retention	12
Bulk Density	15
Cation Exchange Capacity	17
Soil Reaction	18
Hydraulic Conductivity	23
Percolation	24
Agricultural Capability	27
CONCLUSIONS	28
LITERATURE CITED	31
APPENDIX TABLES	
Soil Properties	34
Charlton .	41
Sutton	51
Paxton .	61
Woodbridge	71

SUMMARY

Charlton, Sutton, Paxton and Woodbridge soil series were each sampled at five locations. Chemical and physical properties evaluated included: particle size distribution, soil reaction, moisture retention, bulk density, coarse fragment volume, exchangeable bases and acidity, saturated hydraulic conductivity, organic carbon and percolation. Properties were evaluated on an horizontal basis whenever possible. Sampling depth was to 40 inches. The samples represent a range of characteristics within each soil series. Each site is not to be considered modal for the particular soil series but was considered to within the range of characteristics of the series at the time of sampling.

CHEMICAL AND PHYSICAL PROPERTIES OF THE CHARLTON,
SUTTON, PAXTON AND WOODBRIDGE SOIL SERIES

R. V. Rourke¹ and C. Beek²

Introduction

The soils of Maine are a natural resource that must be understood if the state is to fully utilize all of its assets. Soil series are recognized as mapping units and are outlined on aerial photographs. When the chemical and physical characteristics of the soil units are known soil maps can be used for multipurpose planning. An attempt, based upon limited data, to interpret the soil series in Maine has been made (13).

Other researchers have investigated some of the properties of Maine soils and reported their results (3, 4, 6, 12, 14). The objective of these studies has been varied and sometimes limited to specific soil characteristics. This study is a continuation of the attempt to broaden the knowledge of the soils that exist in the state and to serve as a basis from which the soils studied may be interpreted. The soils sampled for this report were located in Kennebec County, Maine.

The Charlton soils are well drained and the Sutton soils are moderately well drained. Both soils are developing in glacial till that is more than 40 inches deep. They differ

¹Assistant Professor of Plant and Soil Sciences, Department of Plant and Soil Sciences, Maine Agricultural Experiment Station.

²Technician, Department of Plant and Soil Sciences, Maine Agricultural Experiment Station.

as a result of their position in the landscape. Charlton is on the higher elevations of the till ridges. Sutton is in the slight depressions and along the lower margins of long slopes. The Charlton soils are classified as Entic Haplorthods in the coarse-loamy, mixed, mesic, family (17) Sutton soils are classified as Aquentic Haplorthods in the coarse-loamy, mixed, mesic, family (17).

The Paxton and Woodbridge soils are related in a similar manner with Paxton being well drained. They are glacial tills with a fragipan in the lower portion of the profile. The two soils are similar in texture to Charlton and Sutton. Paxton soils are on the upper slopes of hills and are associated with Woodbridge soils in the depressions or along the seepage areas of longer slopes. Paxton soils are classified as Entic Fragiorthods in the coarse-loamy, mixed, mesic family (17) Woodbridge soils are classified as being Aquentic Fragiorthods in the coarse-loamy, mixed, mesic family (17)

In Maine, these soils are found on the glacial till ridges of Androscoggin, Cumberland, Kennebec, Knox-Lincoln, Sagadahoc and Waldo Counties (11) The soils are developing in materials weathered from mica schist, gneiss and granite (5) They have similar textures and are often found in close association in the landscape. At sites 1 of Charlton and Sutton, a fragipan was noted at depths greater than 40 inches. This condition has been observed at another

location^{1/} This suggests the possibility that the difference when comparing Charlton to Paxton and Sutton to Woodbridge might be the depth of loose material above the fragipan.

Procedure

The soil sites selected for sampling were observed by excavating a pit with a small tractor mounted backhoe. The five sites of each soil sampled were described by Soil Scientists of the Soil Conservation Service, U.S.D.A. Sites within a series were separated by a minimum of one mile. Variation within a soil series needs to be estimated and for this reason an attempt was made to assess the range of characteristics of the soils included in the different mapping units.

The field procedure carried out at each site has been previously described (12) The bulk samples were frozen to meet quarantine regulations concerning the transportation of soil from an area infected by the Japanese Beetle to a zone where the insect has not spread. Laboratory procedure followed was as reported previously (12) except as follows: Available water, bulk density, and water content are reported on a stone free basis using methods that have been described by Reinhart (10)

^{1/} Personal observation on a review of soils in Knox-Lincoln Counties in 1968.

The volume of water retained in each soil horizon can be adjusted by the stone content reported for each horizon.

Results and Discussion

Profile descriptions, chemical and physical data are presented in the Appendix for each soil horizon sampled. Soil sites selected as approaching modal for each series at the time of sampling are: Charlton, Site 2; Paxton, Sites 2 and 5; Sutton, Site 5; and Woodbridge, Site 1.

Composite tables of some of the soil characteristics have been constructed, using weighted means, which make it possible to compare the four soil series. Within soil series the profiles were divided into 8-inch zones to a depth of 40 inches. This often resulted in soil characteristics being in unequal subclasses within each zone. Each quantified value was multiplied by its depth within the zone, the product were added and divided by the zone depth to find the weighted mean.

Particle Size Distribution

A comparison of the weighted means of sand, silt, and clay in 8-inch depth layers to 40 inches is presented for each soil series in Figures 1 through 3. Appendix Tables 1 through 3 present the range and mean values of each of these depth intervals.

Charlton and Sutton soils become sandier with increasing depth. Paxton and Woodbridge soils increased in sand to a depth range of 16 to 24 inches and then decreased slightly.

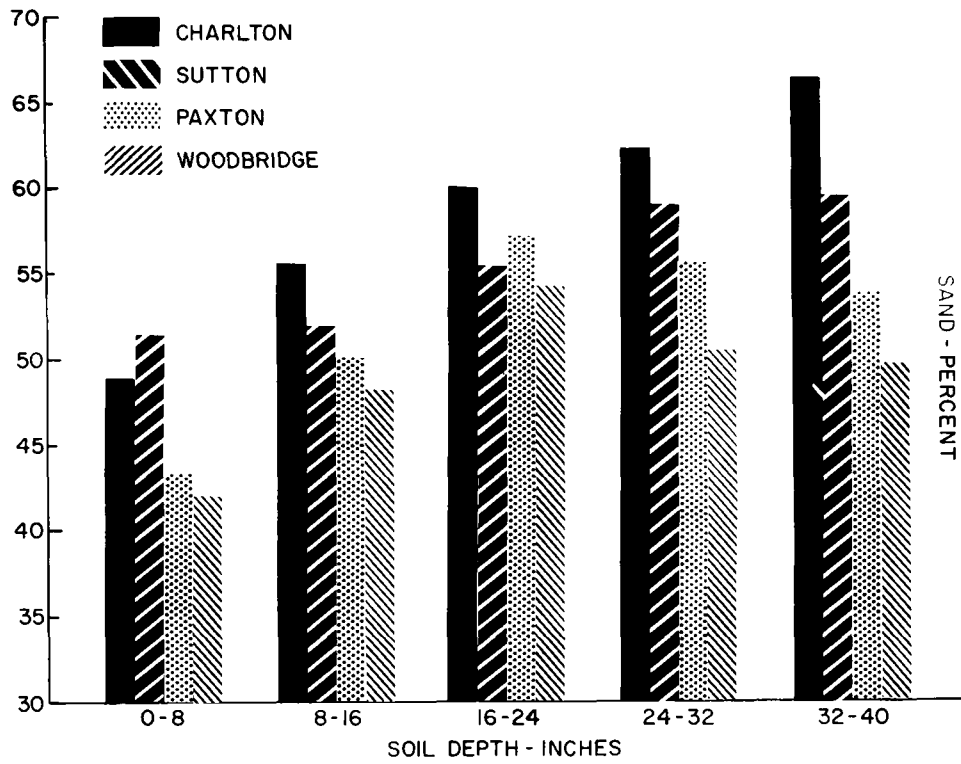


Figure 1. Sand (2.0-0.5 mm.) content of 4 soil series expressed as weighted means for 8-inch depth zones.

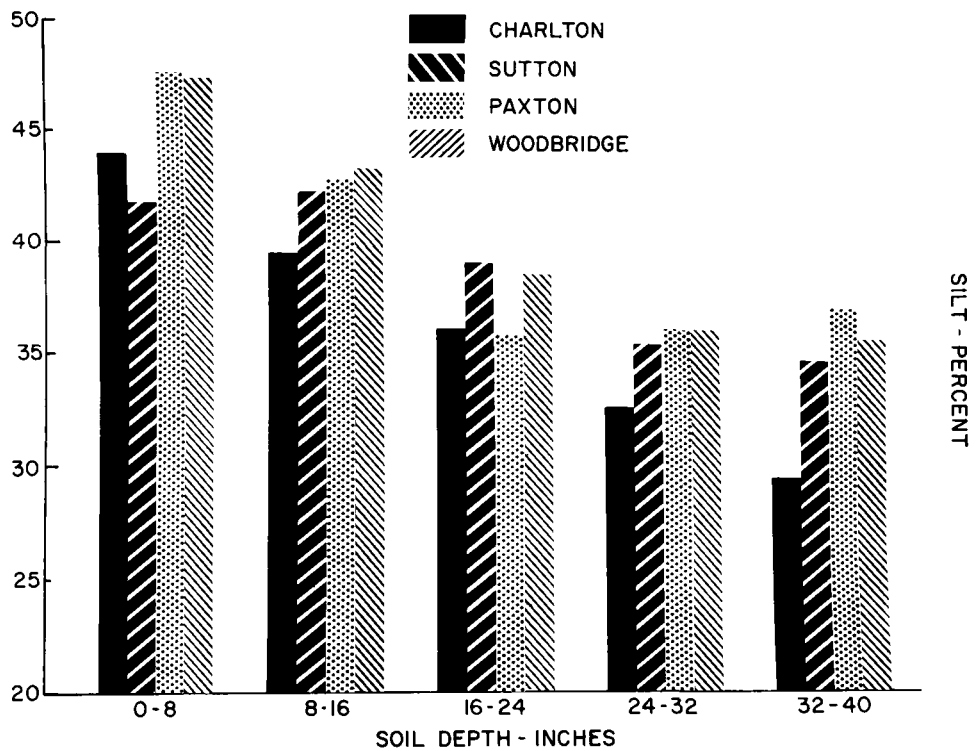


Figure 2. Silt (0.05-0.002 mm.) content of 4 soil series expressed as weighted means for 8-inch depth zones.

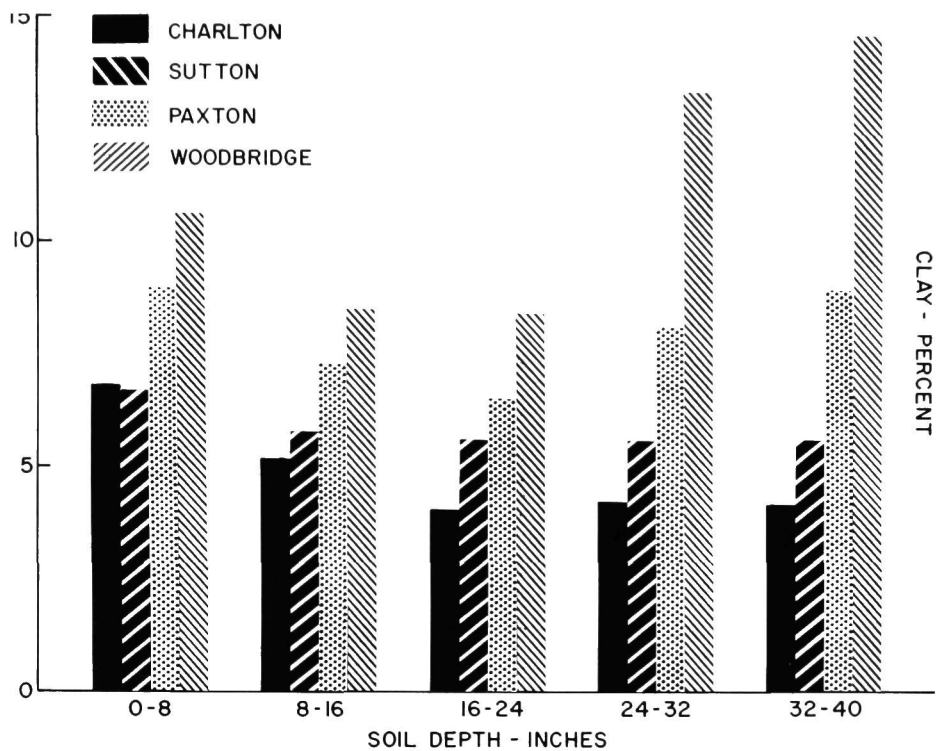


Figure 3. Clay (< 0.002 mm.) content of 4 soil series expressed as weighted means for 8-inch depth zones.

Silt values decreased steadily in the Charlton and Sutton soils as depth increased. Paxton soils reached a minimum silt content in the 16 to 24 inch depth and then increased slightly as depth increased to 40 inches. The silt content in the Woodbridge series decreased steadily from the surface to the 16 to 24 inch zone and remained nearly constant in the next 16 inches.

The clay content of these soils is low and drops to between 4% and 6% below the 16 to 24 inch layer of Charlton and Sutton. In contrast, Paxton and Woodbridge reach a clay minimum in the 16 to 24 inch zone and then increase in clay to the depth of 40 inches. The clay increase in these soils occurs at the approximate depth of the fragipan. The average clay increase in the Woodbridge soil is sufficient to meet the criteria of an argillic horizon as defined in the March, 1967 Supplement to Soil Classification System (14). The average clay increase in the Paxton is not sufficient to be an argillic horizon. This increase in clay at these depths, or lack of clay decrease, has also been presented for the Paxton series by Hill and Gonick (5).

Coarse Fragment

The size distribution of the coarse fragments within each horizon sampled is given with the profile description in the Appendix. A weighted mean of the total coarse fragments in each soil series is presented graphically in

8-inch depth zones in Figure 4 and numerically in Appendix Table 4.

The low volume of stone in the surface 8 inches is probably the result of stone removal to facilitate farming operations. There is a wide range in stone content with as great a range existing within a soil series as between soil series.

Organic Carbon

The organic carbon content of the soils is greatest in the surface and generally decreases regularly as depth increases to 40 inches. Figure 5 shows the distribution of the weighted mean of organic carbon in 8-inch depth zones for each soil series. Appendix Table 5 presents the numerical values for mean and range of organic carbon content.

Charlton site 5 and Sutton site 3 decreased irregularly in organic carbon content. These were the only instances of an increase in organic matter with increasing depth. As previously reported (6), the highest organic levels in the horizons below 16 inches were in the Charlton and Sutton soils which do not have a fragipan. The presence of organic residues at these depths may reflect root penetration. Root penetration in Paxton and Woodbridge soils is restricted to the area above the pan. Sutton soils have a lower organic content below the 24 inch zone perhaps the result of a seasonal water table that would interfere with root growth.

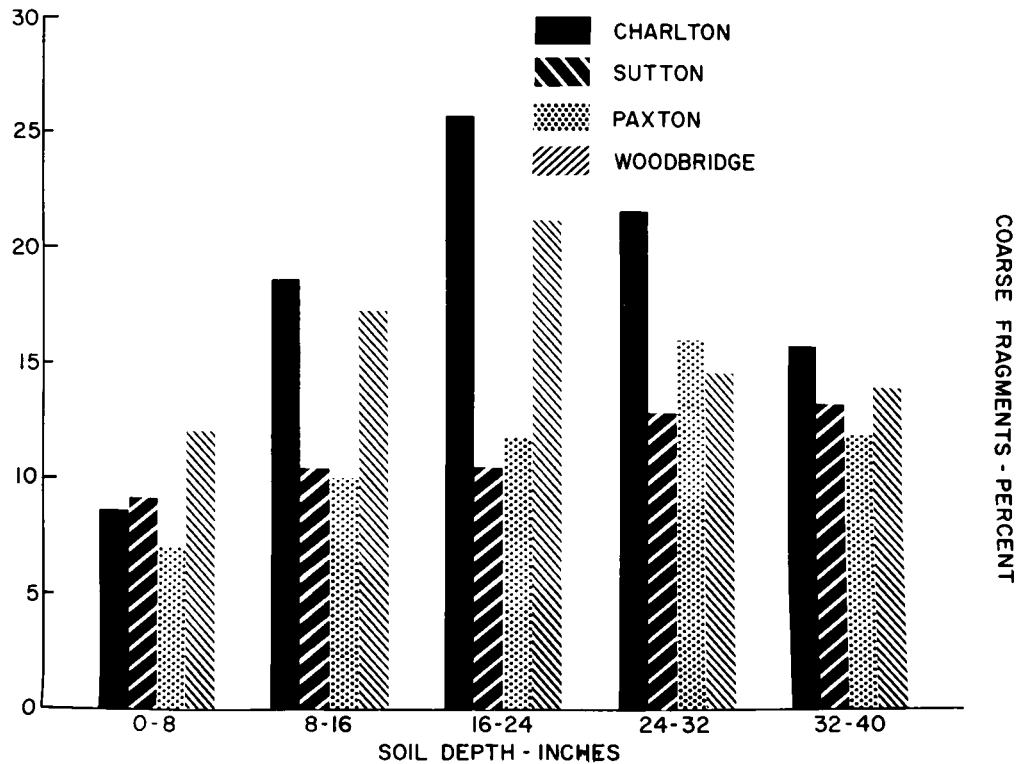


Figure 4. Weighted means of coarse fragment volume for 4 soil series at 8-inch depth intervals expressed as percent of material larger than 2 mm.

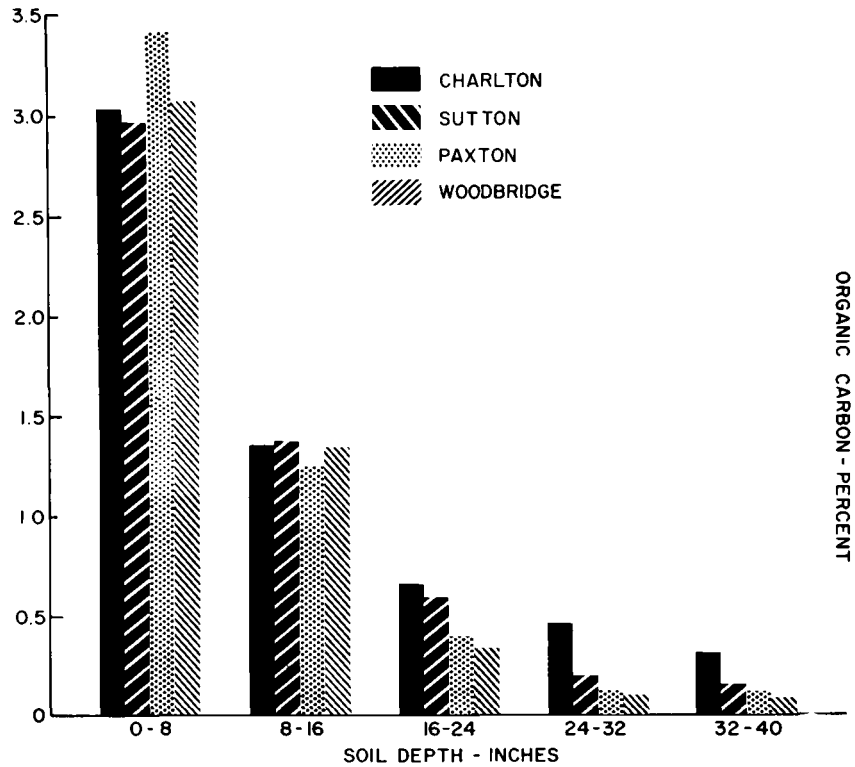


Figure 5. Weighted means of organic carbon content in 8-inch depth zones of 4 soil series.

The organic carbon content in the surface layer was highest in the Paxton series with little difference between the other three soils. The high levels of organic carbon in the surface of Paxton have accumulated under orchard mulches. The Paxton soils have the lowest amount of organic carbon when the soils are compared in the 8 to 16 inch zone.

Water Retention

Accumulated available water retained by the soil (free of all material larger than 2 mm.) is presented in Figure 6 and Appendix Table 6. Adjustment of the available water content in the soil by the average volume of stone measured is presented in Figure 7 and Appendix Table 7. A comparison the values presented in Figure 6 and Figure 7 show that total available water was decreased between 0.7 and 1.0 inches by the presence of material larger than 2 mm. The greatest loss of soil water as a result of stone volume adjustment was in the Woodbridge series.

Charlton soils retained the least amount of available water. This soil was lowest in silt and clay but highest in sand. Sutton soils retained the greatest amount of water in a form available for plant use. The presence of a seasonal water table within the top 40 inches of the soil surface in Sutton soils limits root penetration and growth.

The amount of water available for plant use in the Paxton and Woodbridge soils in the top 40 inches is between that of Charlton and Sutton. The availability of the water

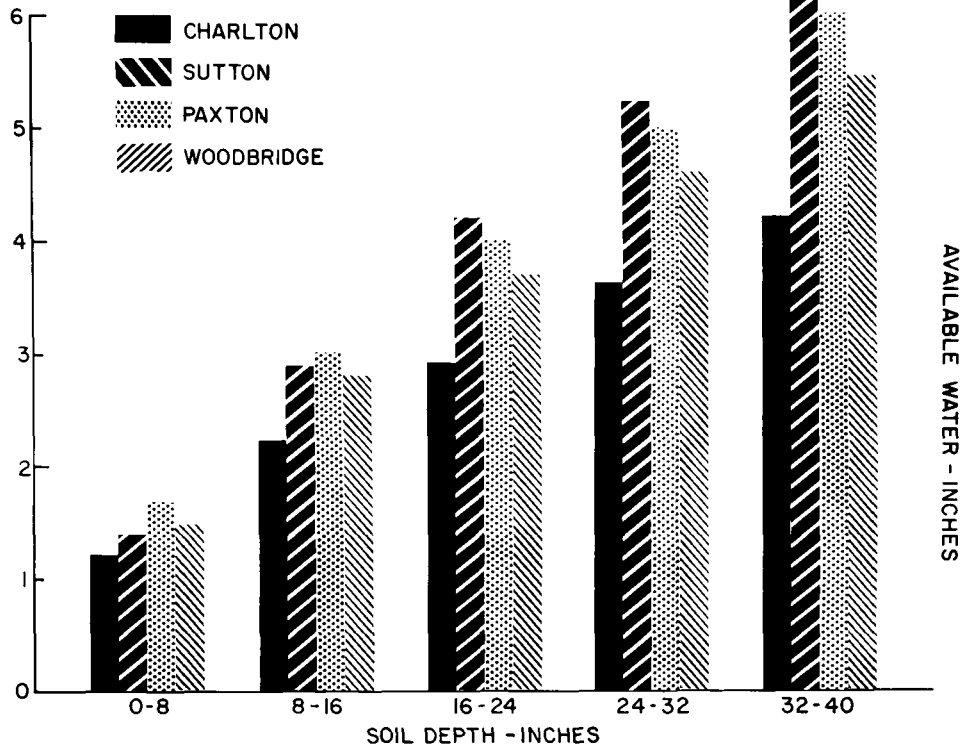


Figure 6. Accumulation weighted means of inches available water in 4 soil series at 8-inch intervals of stone free soil.

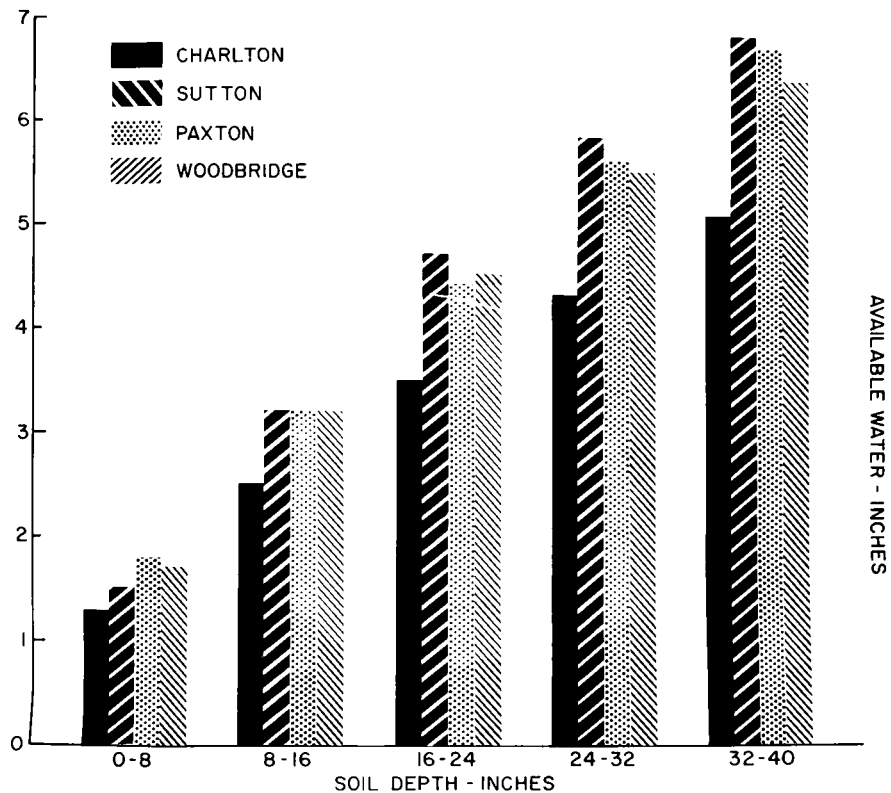


Figure 7. Accumulation of weighted means of inches available water at 8-inch intervals in 4 soils adjusted for average volume of stone.

retained in the lower 16 inches of the profile is limited by the extent to which this zone has been penetrated by plant roots. This layer is in the fragipan where only small numbers of roots are observed. Thus, it is possible that the available water of these soils should be adjusted to compensate for the fragipan. Effective rooting area of the Woodbridge soils may be further limited by a seasonal water table. The presence of the pan in these soils prevents rapid or excessive percolation following water additions. As a result, the soil may contain more water in an available form than would be indicated by the 0.33 wilting point value.

Bulk Density

Bulk density values of 8-inch soil layers are presented in Figure 8 with mean and range values in Appendix Table 8. Bulk density values of each horizon are presented with the profile descriptions. All density values reported have been adjusted for coarse fragments larger than 2 mm. in diameter.

Charlton soil layers generally increase in density at a slower rate than the other soils in the study. There is little difference in the density of Sutton and Woodbridge in the 24 to 40 inch zones. Paxton soils increase in density with increasing depth to the 24 to 32 inch zone below which the change is only slight. With the exception of Charlton

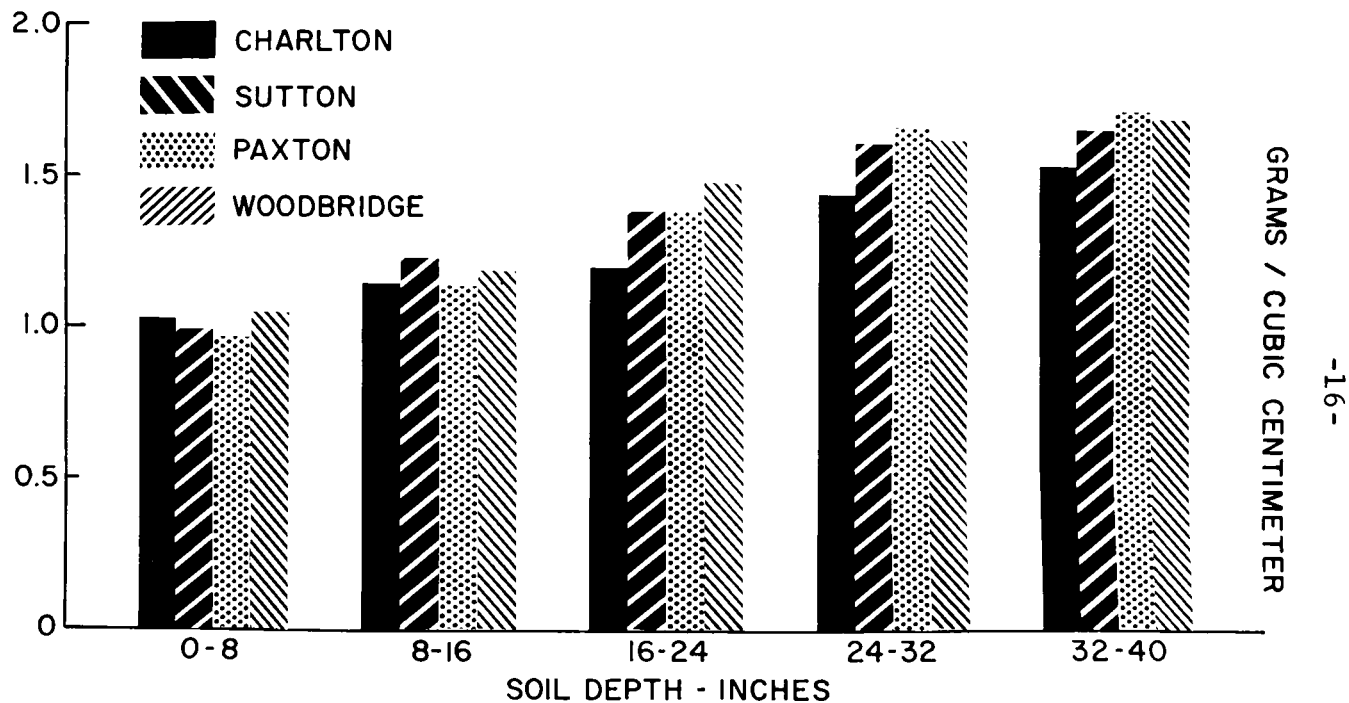


Figure 8. Weighted average of the bulk density as g./cc. of 4 soil series at depth intervals of 8 inches with stones removed.

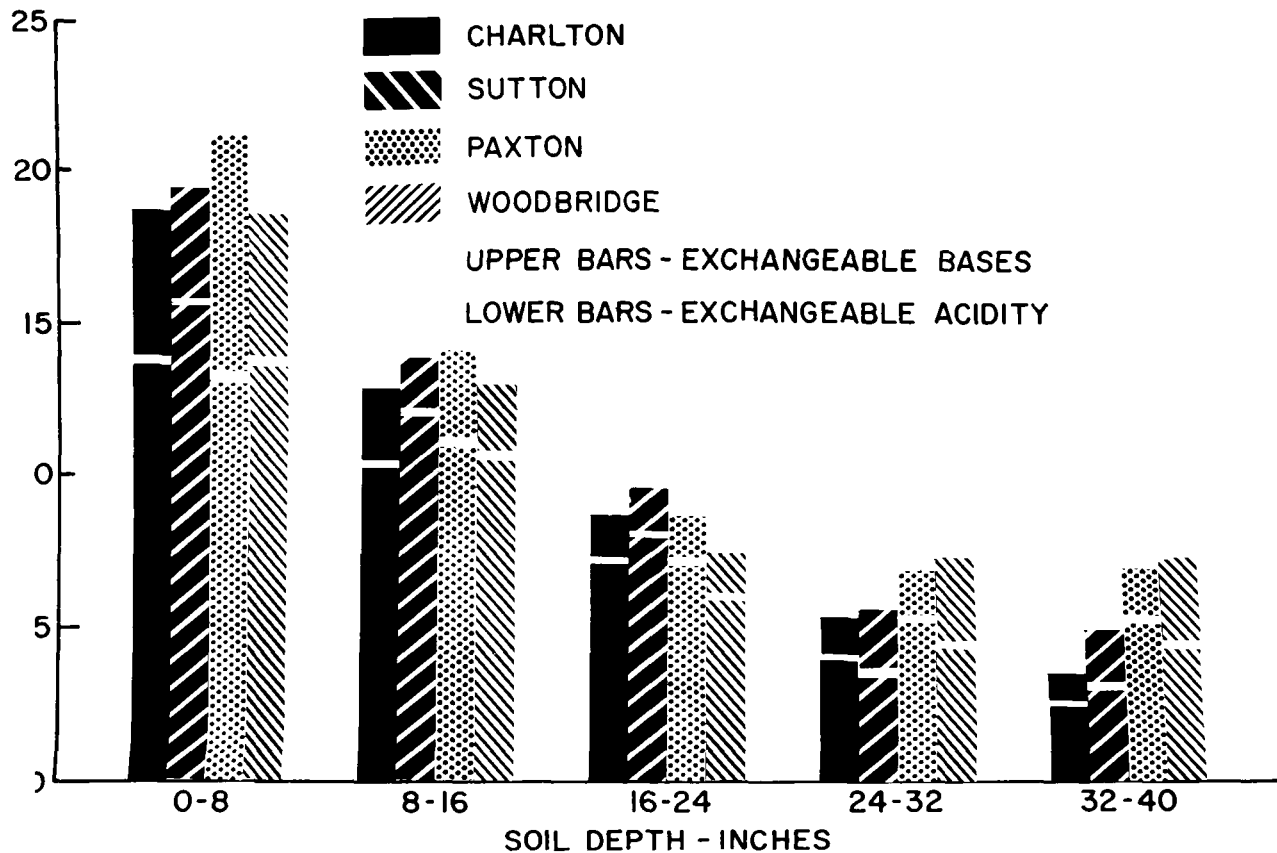
he soils exceed an average bulk density of 1.60 g/cc. below the 16 to 24 inch depth zone. Root penetration and growth has been found to either decrease or cease when bulk density values exceed 1.50 g/cc. (2, 9, 19).

Cation Exchange Capacity

Variation in cation exchange capacities (CEC) of the four soil series is small. As shown in Figure 9 or appendix Table 9, the CEC is highest in the surface and decreases in all soils to the 16 to 24 inch zone. Charlton and Sutton soils continue to decrease in CEC to a 40 inch depth. Paxton and Woodbridge soils do not decrease in CEC in the two lowest 8 inch zones. The layers highest in organic carbon are highest in CEC as has been previously reported (6).

Exchangeable acidity (EA) is shown in Figure 9 and appendix Table 10. It is highest in the surface layers and decreases in a manner similar to CEC. There is no decrease in EA in the two lowest 8 inch zones of Paxton and Woodbridge.

Percent base saturation as seen in Appendix Table 11 is highest in the lowest zone and lowest in the 8 to 16 inch zone of Charlton, Sutton and Woodbridge. Paxton soils reach a minimum of base saturation in the 16 to 24 inch zone. The moderately well drained soils have higher base saturation in the lower layers than do the well drained soils. There is little difference in percent base satura-



on when lower regions of soils in similar drainage classes
compared. There are proportionally more bases present in
the fragipan zones. In the fragipan layers EA and CEC remain
about constant. The increase in bases may be as a result of
alluvial clay accumulation or a lack of leaching. When the
fragipan is not present, CEC and EA decrease with either no
change or a decrease in extractable bases in the lowest 16
horizons evaluated.

Soil Reaction

The pH of the soils was measured using a water:soil
mixture and in a salt solution:soil mixture. The results
are reported for each horizon with the profile description.
The weighted means of 8 inch depth zones are
presented in Figures 10 and 11 with numerical means and
ranges for the zones presented in Appendix Tables 12 and 13.

Mean soil reaction is highest in the surface layers of
the Paxton and Woodbridge soils when measured in water. This
reflects the management of the land for apple production which
seems to be centered on the Paxton series in the sampling
area. Management may have influenced the soil reaction of
the average profile in that pH is not below 5.5 at or in the
top of the fragipan as has been noted by other researchers (1, 20)
however, in other work there is little evidence of a maximum
value of 5.5 at or in the top of the fragipan (5,16)

Soil reaction of the salt:soil solution was highest in the

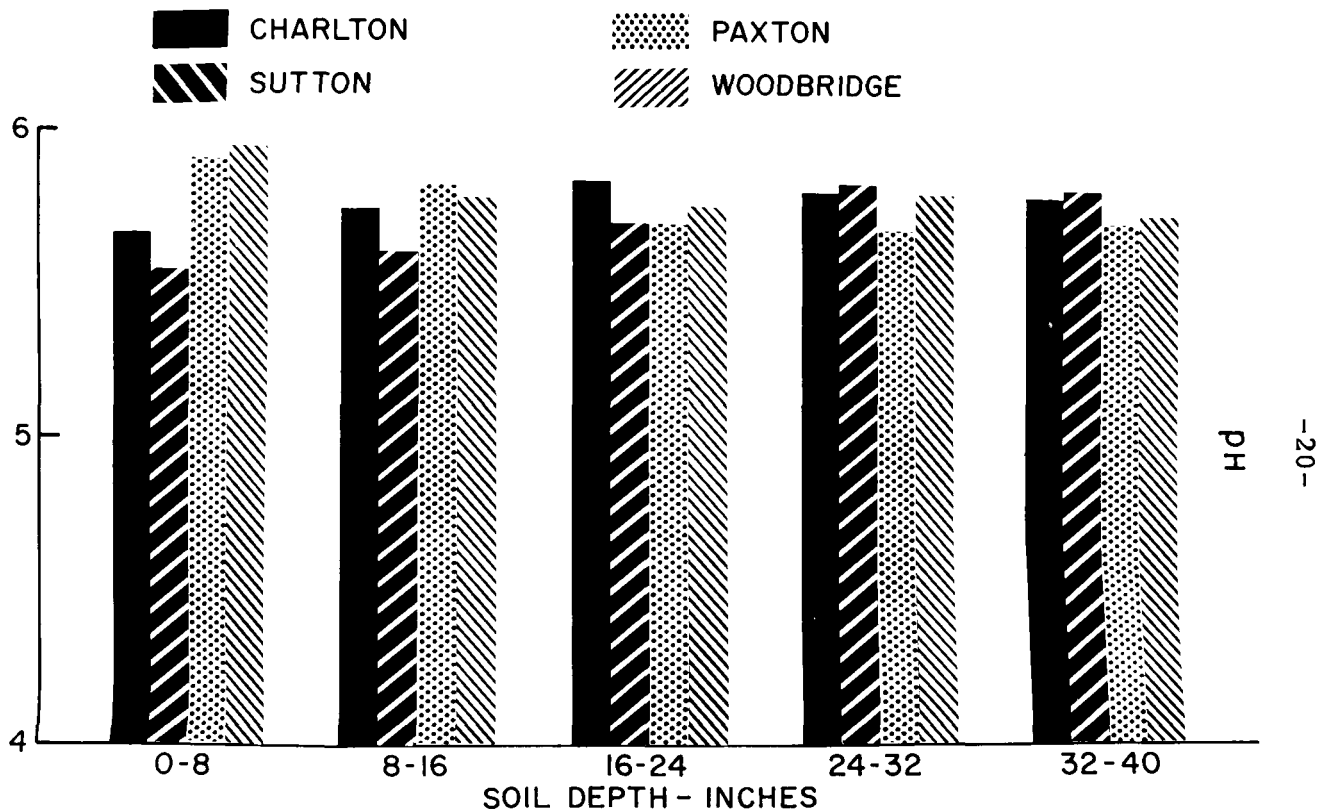


Figure 10. Soil reaction in a 1:1 water:soil mixture as the weighted mean of 8-inch depth intervals to 40 inches for 4 soil series.

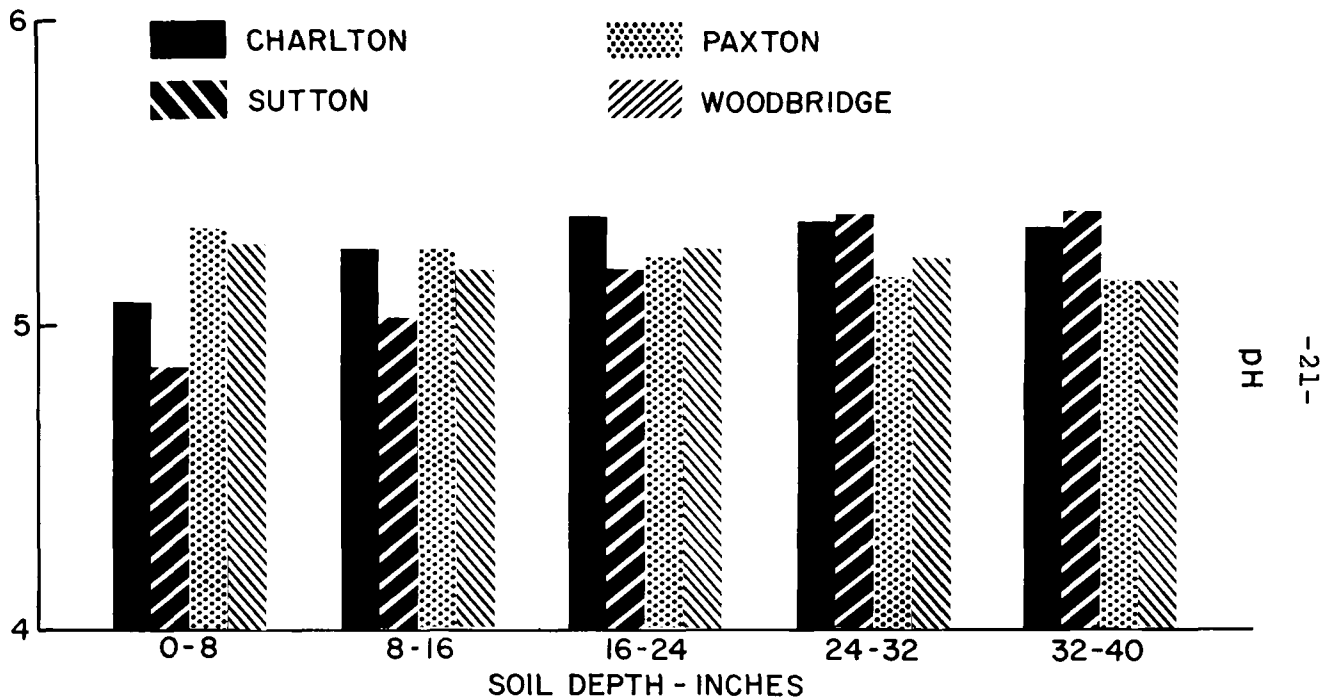


Figure 11. Soil reaction in a 2:1 CaCl₂: soil mixture as the weighted mean of 8-inch depth intervals to 40 inches for 4 soil series.

32 to 40 inch zone of Sutton and the 16 to 24 inch zone of Charlton. Mean soil reaction values of Paxton show that the pH is highest in the surface and decreases with depth.

Woodbridge soils decrease in pH from the surface to the 8 to 16 inch zone, and from the 16 to 24 inch zone to 40 inches. The removal of the salt influence upon pH of the soil, by use of the salt solution, indicates that the most acid condition is in the zones (24 to 32 and 32 to 40 inches) of the fragipan in Paxton soils. The moderately well drained Woodbridge soil does not reach its lowest pH until the 32 to 40 inch zone.

Hydraulic Conductivity

Saturated hydraulic conductivity as measured in vertical soil cores in the laboratory is shown as weighted means in Figure 12. Appendix Table 14 presents the numerical means and their range in 8 inch zone groupings. Values for each horizon sampled are reported with the profile description.

Water movement was most rapid in soils that did not have a fragipan. Sutton had the fastest rate of water movement in the surface 8 inch zone, but in the other zones the rate was greatest in Charlton. Sutton, Paxton and Woodbridge soils decreased regularly in rate of water movement as depth increased. Charlton increased in rate of water movement from the surface to the 8 to 16 inch zone and then decreased.

O'Neal (8) has classed various rates of hydraulic

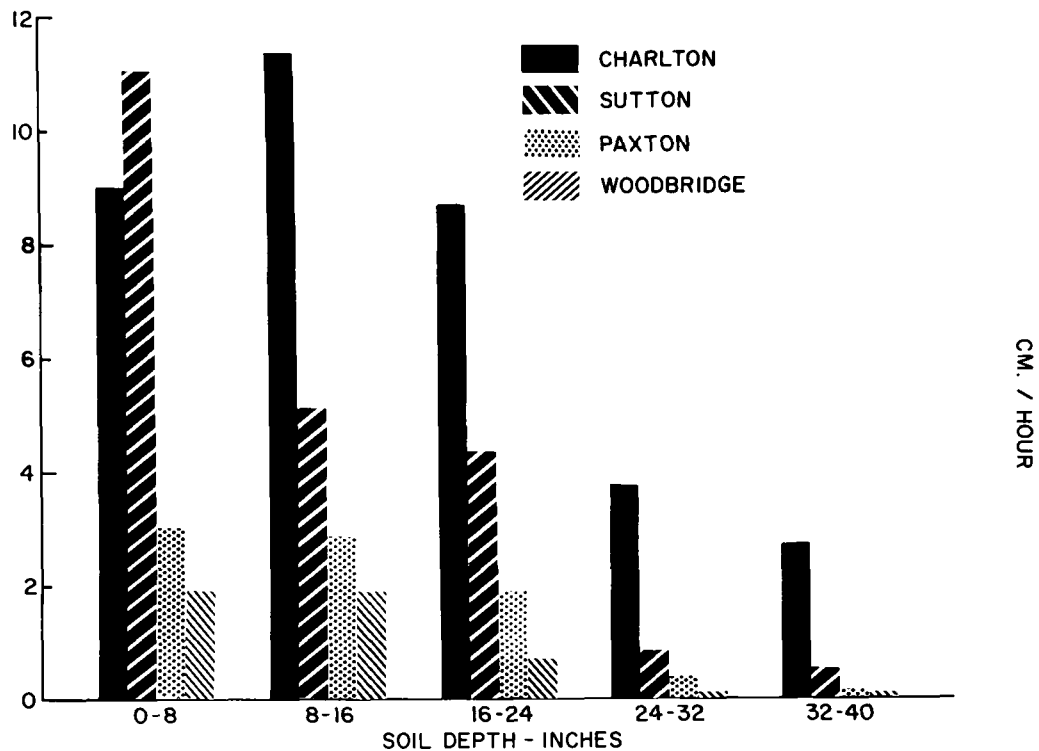


Figure 12. Saturated hydraulic conductivity of 8-inch depth zones to 40 inches in four soil series expressed as weighted means.

CM. / HOUR

conductivity into seven groups ranging from very slow to very rapid. Using this classification as a guide, the soil series may be described as to the rate by which water moves through them. Charlton has "moderately rapid" water movement in the top 24 inches and "moderate" rates in the 24 to 40 inch region. Sutton soils had "moderately rapid" rates in the surface 8 inch layer, "moderate" rates in the 8 to 24 inch layer, and "moderately slow" rates of water flow in the next 16 inches. Paxton soils had "moderate" water flow rates in the surface 16 inches, "moderately slow" rates in the 16 to 24 inch zone, and "slow" rates in the lowest 16 inches tested. Woodbridge soils had "moderately slow" water flow rates in the top 24 inches, "slow" rates in the 24 to 32 inch layer, and "very slow" water flow in the 32 to 40 inch zone.

In each instance the moderately well drained soils have slower rates of water movement than their well drained counterparts when the 8 to 40 inch zones are compared. Within the limits of this investigation soils with fragipans have slower rates of vertical water flow than soils with no pan.

Percolation

The ease by which the soil may be used to absorb waste waters from septic tanks is judged by percolation tests (18). The results of percolation tests on the soils in this study are presented in Table 1. Rates of more than 60

Table 1. Percolation rates of four soil series, each at five sites, at a depth of 30 inches.

Soil Series	Minutes per Inch	
	Mean	Range
Charlton	10.4	3.5 to 21.4
Wotton	36.9	17.6 to 81.5
Paxton	18.4	8.2 to 39.7
Woodbridge	47.3	13.2 to 83.3

Minutes per inch are too slow for use as filter fields, and rates slower than 30 minutes per inch are too slow for seepage tests (18).

Based upon percolation rates it is possible to predict rates and amounts of septic tank effluent that can be successfully applied to the soil. Table 2 indicates the amount of effluent a square foot of soil can absorb from establishments that have larger quantities of sewage than would be expected from a single family residence.

Charlton and Paxton soils absorb water at rates that indicate these soils to be satisfactory for use as absorption fields. For an equal amount of sewage effluent, less absorption area is required in the Charlton soils than is for the Paxton series.

Table 2. Soil absorption of effluent from small instituti

Soil Series	Gallons/square foot/day	
	Average	Range
Charlton	1.5	1.1 to 2.7
Sutton	0.8	<0.6*to 1.2
Paxton	1.2	0.8 to 1.7
Woodbridge	0.7	<0.6*to 1.4

* Rates <0.6 gal./sq. ft./day are not recommended for use

Sutton and Woodbridge soils do not always absorb effluent adequately and require an on site evaluation at each potential location. These soils have a water table above a 30 inch depth during periods of high soil moisture. The presence of ground water in the absorption area will limit the efficiency of the system in removing septic tank effluent from the environment.

Percolation rates are also used to predict the absorption area required for single family residences. As seen in Table 3, the relationships first presented as saturated hydraulic conductivity (Fig. 12) remain.

At all sites Charlton and Paxton soils could be used for filter fields. Paxton soils generally need a greater trench area than do the Charlton soils. The

^{1/} Based upon requirements of U.S. Dept. of Health, Education, and Welfare (18).

le 3. Square feet of absorption area (trench bottom) needed for each bedroom in a single family residence.^{1/}

1 Series	Square Feet Required	
	Average	Range
rlton	168	105 to 217
ton	275	200 to >330*
ton	204	152 to 285
dbridge	305	183 to >330*

Unsuited as percolation rates exceed 60 minutes per inch.

e of the filter field will depend upon the rate of water
ement at that site.

The range of data within the Sutton and Woodbridge soils
icate that some locations could be used as absorption
lds and other sites would be of little value. On-site
estigations are needed to locate and establish the size
the absorption field. As shown in other studies (7, 12) the
sence of a seasonal water table in these soils is an additional
ard to their use for effluent removal.

Agricultural Capability

The yield of various crops grown at high levels of
agement are presented in Table 4. These data present the
hest yields obtained within the year noted or the average

Based upon requirements of U. S. Dept. of Health, Education,
and Welfare (18).

of the treatment producing the highest yields over a period of time. The locations of the various research trials were scattered and within any year the results are influenced by local variances in climatic patterns. There are no data available for Sutton or Woodbridge soils

Conclusions

A comparison of the soil series based upon composite profiles of 8-inch depth intervals to a 40 inch depth brings out several interesting relationships.

The Charlton and Sutton soils become sandier as depth increases to 40 inches. Paxton and Woodbridge soils increase in sand to the top of the fragipan, below which sand decreases. The silt and clay content in the fragipan is nearly constant. Woodbridge soils have more clay in the fragipans than do the Paxton soils.

Charlton soils retain less water in a plant-available form than do Paxton, Sutton or Woodbridge. There is little difference in water retention where Paxton, Sutton and Woodbridge soils are compared.

Bulk density increases as depth increases and is above 1.50 g/cc. at most sites of Sutton, Paxton and Woodbridge below 24 inches. In Charlton soils bulk density values generally do not exceed 1.50 g/cc. until a depth of 32 inches is reached.

Table 4. Agricultural yields obtained from research trials at the highest level of management.

Commodity	Years	Yield	Soil Series
Field Corn ^{1/} (Wisc. 335A)	1966	11.0 Tons/dry matter/Acre	Charlton
Orchardgrass ^{2/}	1967	5.4 Tons/dry matter/Acre	Paxton
Alfalfa ^{3/}	1961 to 1964	4.41 Tons/dry matter/Acre	Charlton
Timothy ^{3/}	1961 to 1964	3.54 Tons/dry matter/Acre	Charlton
Alfalfa and Orchardgrass ^{3/}	1967 to 1968	4.05 Tons/dry matter/Acre	Paxton
Apples (McIntosh) ^{4/}	1958 to 1968	927 bu./Acre (44 lbs./bu.)	Paxton

^{1/} Data supplied by Mr. V. Holyoke

^{2/} Data supplied by Prof. F. E. Hutchinson

^{3/} Data supplied by Prof. C. S. Brown

^{4/} Data supplied by Prof. W. E. Stiles

The cation exchange capacity decreases with increasing depth in the Charlton and Sutton soils. In Paxton and Woodbridge soils CEC does not decrease in the fragipan.

Saturated hydraulic conductivity in vertical cores is greatest in Charlton and Sutton soils. Sutton and Woodbridge soils decrease in flow rates to a greater extent as depth increases than do their well drained counterparts.

Charlton and Paxton soils can be used for septic effluent absorption fields. Paxton soils require greater land area in the filter field than do Charlton soils. Sutton and Woodbridge soils need on-site testing during periods of high soil moisture before installing an absorption field.

Literature Cited

- Carlisle, F. J. Jr., E. G. Knox and R. B. Grossman. 1957. Fragipan horizons in New York soils; I General characteristics and distribution. Soil Sci. Soc. of Amer. Proc. 21:320-321.
- De Roo, H. C. and P. E. Waggoner. 1961. Root development of potatoes. Agron. J. 53:15-17.
- Epstein, E., W. J. Grant, and J. S. Hardesty. 1962. Soil moisture survey of some representative Maine soil types. A.R.S. 41-57 U.S.D.A. Agricultural Research Service.
- Grant, W. J. and E. Epstein. 1962. Physical properties and moisture relationships of some representative Maine soil types. University of Maine, Orono, Maine. Bul. T2, Technical Series.
- Hill, D. E. and W. N. Gonick. 1963. The Paxton soils. Conn. Agric. Exp. Sta., New Haven, Bul. 662.
- Hutchinson, F. E. 1968. Chemical properties of seven agricultural soil series and there relationship to soil fertility. Me. Agric. Exp. Sta. Tech. Bul. 31.
- Latshaw, G. J. and R. F. Thompson. 1968. Water table study verifies soil interpretations. J. of Soil and Water Conservation 23:65-67.
- O'Neal, A. M. 1952. A key for evaluating soil permeability by means of certain field clues. Soil Sci. Soc. of Amer. Proc. 16:312-315.
- Phillips, R. E. and D. Kirkham. 1962. Mechanical impedance and corn seedling root growth. Soil Sci. Soc. Amer.

10. Reinhart, K. G. 1961. The problem of stones in soil moisture measurement. Soil Sci. Soc. Amer. Proc. 25:268-270.
11. Rourke, R. V. and J. S. Hardesty. 1966. The soils of Maine. Me. Agric. Exp. Sta. Misc. Pub. 676.
12. Rourke, R. V. and C. Beek. 1968. Soil-water, chemical and physical characteristics of eight soil series in Maine. Me. Agric. Exp. Sta. Tech. Bul. 29.
13. Soil Conservation Service, U.S.D.A. and College of Life Sciences and Agriculture, University of Maine 1967. Soil suitability guide for land use planning in Maine. Me. Agric. Exp. Sta. Misc. Pub. 667 (Rev.).
14. Soil Survey Staff. 1967. Supplement to soil classification system (7th Approximation). U.S.D.A. Soil Conservation Service, Washington, D.C.
15. Stratton, K. G. and R. A. Struchtemeyer. 1968. An evaluation of soil sites for white pine in Maine. Me. Agric. Exp. Sta. Tech. Bul. 32.
16. Tamura, T. 1956. Physical, chemical and mineralogical properties of brown podzolic soils in southern New England: Paxton and Merrimac series. Soil Sci. 86:287-299.
17. U.S.D.A. Soil Conservation Service. 1968. Soil classification system placement of series - Northeastern region. U.S.D.A. Soil Conservation Service Northeastern Regional Tech. Ser. Center, Upper Darby, Pa.
18. U.S. Dept. of Health, Education and Welfare, Public Health Service 1960. Manual of Septic Tank Practice. Pub. No. 526.

- Veihmeyer, F. J. and A. H. Hendrickson. 1948. Soil density and root penetration. Soil Sci. 65:487-493.
- Zachary, A. L. and H. P. Ulrich. 1965. Fragipans--What are they? Purdue Agric. Exp. Sta. Res. Progress Rpt. 184, Project 910.

Table 1. Weighted means of the sand (2.0 mm - 0.5 mm) content of 4 soil series expressed as percent at 8-inch depth intervals.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	49.1(40.0-54.1)	55.5(39.1-68.4)	60.0(48.7-72.1)	62.5(49.2-69.4)	66.4(49.9-77.6)
Sutton	51.5(40.3-58.0)	52.0(41.2-64.5)	55.6(42.2-65.9)	59.0(43.7-71.9)	59.5(43.7-71.9)
Paxton	43.5(41.3-46.7)	50.0(42.1-57.3)	57.1(50.5-63.1)	55.6(48.8-67.3)	53.9(48.0-60.6)
Woodbridge	42.1(40.5-43.7)	48.4(41.1-54.4)	54.3(52.6-59.3)	50.8(47.1-58.0)	49.7(47.1-57.2)

Table 2. Weighted means of the silt (0.5 - 0.002 mm) content of 4 soil series expressed as percent at 8-inch depth intervals.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	44.0(39.9-50.9)	39.3(27.5-52.5)	35.7(24.0-44.9)	32.5(26.0-42.8)	29.4(19.6-42.1)
Sutton	41.8(34.1-52.5)	42.2(31.2-52.6)	38.8(29.9-48.7)	35.4(25.1-46.1)	34.9(25.1-46.1)
Paxton	47.5(42.7-50.7)	42.7(38.3-50.4)	36.3(29.3-43.2)	36.3(30.0-40.5)	37.0(34.3-40.4)
Woodbridge	47.3(44.1-49.6)	43.1(35.0-52.1)	37.2(32.2-47.5)	35.9(33.7-39.9)	35.7(34.2-38.3)

Table 3. Weighted means of the clay (<0.002 mm) content of 4 soil series expressed as percent at 8-inch depth intervals.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	6.9(4.7-9.1)	5.2(4.3-8.3)	4.3(3.1-6.4)	5.0(3.5-7.9)	4.2(2.4-8.0)
Sutton	6.7(5.5-7.9)	5.8(4.3-6.7)	5.6(4.2-9.0)	5.6(3.1-10.2)	5.6(3.1-10.2)
Paxton	9.0(7.0-13.2)	7.3(4.4-10.1)	6.6(4.1-10.6)	8.1(2.7-15.4)	9.1(5.1-16.1)
Woodbridge	10.6(8.6-12.6)	8.5(6.8-10.5)	8.5(5.6-10.7)	13.3(7.8-17.7)	14.6(8.6-19.2)

Table 4. Weighted means and range of coarse fragment volume by percent at 8-inch depth intervals based upon material larger than 2 mm.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range pct.	\bar{x} Range pct.	\bar{x} Range pct.	\bar{x} Range pct.	\bar{x} Range pct.
Charlton	8.6(6.0-12.0)	18.7(11.9-23.2)	25.6(16.6-33.6)	21.5(12.1-29.2)	17.5(7.7-34.7)
Sutton	9.2(5.4-16.1)	10.1(7.0-14.9)	10.4(5.4-13.5)	12.7(4.8-17.3)	13.2(4.8-20.6)
Paxton	7.2(4.4-15.7)	10.0(5.8-23.0)	11.8(5.4-23.3)	15.8(6.0-25.2)	11.9(4.6-17.1)
Woodbridge	12.0(4.3-37.8)	17.2(9.4-43.2)	21.1(9.4-44.8)	14.6(9.3-26.1)	13.9(8.5-26.1)

Table 5. Weighted means and range of organic carbon content of 8-inch depth zones in 4 soil series.

Soil Series	Percent Organic Carbon				
	0-8" x̄ Range	8-16" x̄ Range	16-24" x̄ Range	24-32" x̄ Range	32-40" x̄ Range
Charlton	3.04(2.81-3.48)	1.33(0.65-2.32)	0.65(0.40-0.84)	0.45(0.19-0.98)	0.30(0.12-0.98)
Sutton	2.96(2.72-3.59)	1.38(0.75-2.39)	0.60(0.15-0.96)	0.18(0.11-0.28)	0.14(0.11-0.18)
Paxton	3.43(2.76-4.12)	1.24(0.65-1.65)	0.38(0.20-0.59)	0.13(0.08-0.19)	0.11(0.07-0.14)
Woodbridge	3.08(2.10-3.79)	1.34(1.08-1.65)	0.34(0.09-0.61)	0.11(0.06-0.20)	0.08(0.06-0.12)

Table 6. Range and weighted means of inches of accumulated available water at 8-inch depth intervals of stone free soil.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	x̄ Range	x̄ Range	x̄ Range	x̄ Range	x̄ Range
Charlton	1.3 (0.7-1.7)	2.5 (1.5-3.5)	Inches Water 3.5 (2.3-4.6)	4.3 (3.3-5.8)	5.1 (4.1-7.2)
Sutton	1.5 (1.0-2.5)	3.2 (2.1-4.8)	4.7 (3.1-6.9)	5.8 (3.9-8.2)	6.8 (4.7-9.4)
Paxton	1.8 (1.0-2.3)	3.2 (1.8-4.2)	4.4 (2.8-5.6)	5.6 (4.0-6.7)	6.7 (5.3-7.8)
Woodbridge	1.7 (1.3-2.2)	3.2 (2.7-3.7)	4.5 (3.8-5.1)	5.5 (4.7-6.5)	6.4 (5.7-7.6)

depth intervals of soil as adjusted for average stone content.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	1.2 (0.6-1.6)	2.2 (1.3-3.1)	2.9 (1.9-3.9)	3.6 (2.7-4.9)	4.2 (3.4-6.1)
Sutton	1.4 (0.9-2.3)	2.9 (1.9-4.4)	4.2 (2.8-6.3)	5.2 (3.4-7.4)	6.1 (4.1-8.4)
Paxton	1.7 (0.9-2.2)	3.0 (1.6-3.7)	4.0 (2.5-4.9)	5.0 (3.5-5.8)	6.0 (4.6-6.8)
Woodbridge	1.5 (1.1-1.9)	2.8 (2.3-3.1)	3.7 (3.2-4.2)	4.6 (4.0-5.4)	5.4 (4.9-6.3)

Inches Water

Table 8. Weighted means and range of the bulk density as g./cc. at 8-inch stone free depth intervals to 40 inches in 4 soil series.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	1.02(0.95-1.12)	1.14(1.06-1.20)	1.20(1.13-1.37)	1.42(1.21-1.65)	1.54(1.48-1.60)
Sutton	0.99(0.92-1.07)	1.21(0.98-1.34)	1.38(1.08-1.75)	1.61(1.49-1.76)	1.65(1.56-1.76)
Paxton	0.95(0.90-1.09)	1.13(1.03-1.18)	1.38(1.23-1.58)	1.67(1.58-1.79)	1.73(1.62-1.95)
Woodbridge	1.03(0.87-1.15)	1.17(1.06-1.27)	1.47(1.22-1.72)	1.63(1.48-1.74)	1.68(1.66-1.73)

Table 9. Weighted means of cation exchange capacity of 4 soil series expressed as me./100 g. at 8-inch depth intervals to 40 inches.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	18.7(17.6-19.7)	12.7(8.4-17.6)	8.6(5.4-11.7)	5.3(2.6-8.1)	3.5(1.9-6.2)
Sutton	19.4(16.5-22.4)	13.8(8.6-18.4)	9.5(6.1-11.8)	5.4(3.0-9.3)	5.0(3.0-9.3)
Paxton	21.1(17.6-27.0)	13.9(8.8-16.9)	8.4(6.3-10.3)	6.8(5.4-8.6)	6.9(5.5-8.5)
Woodbridge	18.4(17.4-21.4)	12.8(11.4-14.3)	7.4(5.4-8.2)	7.1(5.5-8.0)	7.3(5.3-8.4)

Table 10. Weighted means of exchangeable acidity of 4 soil series expressed as me./100 g. in 8-inch depth intervals to 40 inches.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	13.8(11.5-16.5)	10.4(7.1-13.8)	7.3(4.2-10.0)	4.2(2.2-7.5)	2.5(1.5-2.9)
Sutton	15.6(13.4-17.3)	11.8(7.7-15.6)	8.0(4.8-10.6)	3.5(2.6-4.7)	3.1(2.6-3.7)
Paxton	13.1(8.7-17.6)	10.9(7.9-13.0)	7.0(5.1-7.8)	5.2(4.4-6.2)	5.2(4.6-5.9)
Woodbridge	13.4(12.3-14.9)	10.7(9.0-11.6)	5.8(3.0-7.2)	4.4(3.5-5.3)	4.4(3.5-5.4)

Table 11. Weighted mean of the soil reaction as measured in a 1:1 water:soil mixture for 8-inch zones to a depth of 40 inches for 4 soil series.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
Charlton	26.2	18.1	15.1	20.7	28.6
Sutton	19.6	14.5	15.8	35.2	38.0
Paxton	37.9	21.6	16.7	23.5	24.6
Woodbridge	27.2	16.4	21.6	38.0	39.7

-39-

Table 12. Weighted mean of the soil reaction as measured in a 1:1 water:soil mixture for 8-inch zones to a depth of 40 inches for 4 soil series.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	5.65 (5.05-6.59)	5.74 (5.42-6.26)	5.82 (5.5-6.04)	5.78 (5.58-6.05)	5.78 (5.65-6.01)
Sutton	5.53 (5.26-5.85)	5.58 (5.12-5.88)	5.68 (5.3-5.94)	5.79 (5.3-6.1)	5.79 (5.45-6.1)
Paxton	5.93 (5.25-6.78)	5.80 (5.4-6.16)	5.68 (5.38-5.9)	5.65 (5.2-5.95)	5.68 (5.28-5.88)
Woodbridge	5.92 (5.55-6.4)	5.76 (5.49-6.1)	5.74 (5.42-5.94)	5.78 (5.6-5.95)	5.70 (5.45-5.95)

Table 13. Weighted mean of soil reaction as measured in a 2:1 CaCl₂:soil mixture for 8-inch zones to a depth of 40 inches for 4 soil series.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	5.08(4.6-6.22)	5.25(4.82-5.95)	5.36(5.15-5.48)	5.34(5.22-5.4)	5.32(5.28-5.4)
Sutton	4.85(4.65-5.15)	5.02(4.76-5.25)	5.18(4.85-5.45)	5.36(5.15-5.65)	5.37(5.15-5.65)
Paxton	5.32(4.5-6.31)	5.25(4.95-5.68)	5.21(4.98-5.55)	5.15(4.75-5.5)	5.14(4.75-5.39)
Woodbridge	5.28(4.85-5.66)	5.20(5.02-5.4)	5.25(4.95-5.40)	5.22(5.0-5.35)	5.14(4.95-5.35)

Table 14. Weighted mean and range of saturated hydraulic conductivity of 4 soil series in 8-inch depth zones to 40 inches.

Soil Series	0-8"	8-16"	16-24"	24-32"	32-40"
	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range	\bar{x} Range
Charlton	9.0(4.8-17.8)	11.3(4.7-20.9)	8.6(3.8-15.0)	3.7(0.4-7.8)	2.7(0.3-3.8)
Sutton	11.0(0.6-23.0)	5.1(0.2-17.2)	4.3(0.3-13.4)	0.8(0.06-2.1)	0.5(0.06-1.0)
Paxton	3.0(0.2-6.1)	2.9(0.6-6.4)	1.9(0.9-3.4)	0.4(0.1-0.5)	0.2(0.04-0.3)
Woodbridge	1.9(0.03-6.4)	1.9(0.5-6.4)	0.7(0.2-1.7)	0.1(0.02-0.3)	0.08(0.0-0.2)

SOIL DESCRIPTIONS
AND
ANALYSES

CHARLTON SOIL SERIES

Site 1

Location: North Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-13"	Dark brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; abundant roots; abrupt, smooth boundary. (7-13 inches thick)
A ₂	12-13"	Light brownish gray (10YR 6/2) silt loam; weak, fine, granular structure; friable; abundant roots; clear, broken boundary. (0-3 inches thick)
B ₂₁	13-18"	Strong brown (7.5YR 5/6) silt loam; weak, fine, granular structure; friable; abundant roots; clear, irregular boundary. (1-10 inches thick)
B ₂₂	18-26"	Yellowish brown (10YR 5/6) fine sandy loam; weak, fine, granular structure; friable; abundant roots; gradual, irregular boundary. (6-10 inches thick)
B ₃	26-34"	Light olive brown (2.5Y 5/4) fine sandy loam; weak, medium and fine, granular structure; friable; few roots; common weathered schistose and granite rocks that break down to medium and coarse sand when removed; abrupt, irregular boundary. (5-15 inches thick)
C ₁	34-54"	Olive gray (5Y 4/2) fine sandy loam; single grain; firm in place, friable when removed; weathered schistose and granitic rocks same as B ₃ horizon; abrupt, wavy boundary. (15-20 inches thick)
C _{2x}	54-60"+	Olive gray (5Y 4/2) fine sandy loam; strong medium platy structure; brittle; very fine weathered schistose and granite rocks that break to medium and coarse sand when removed.

Soil Series CharltonSite No. 1

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-13	Ap&A2	40.03	50.90	9.07	3.38	5.11	6.95	12.62	11.97	33.15	17.75	
13-18	B21	37.60	55.28	7.12	3.41	5.13	6.64	10.83	11.59	35.20	20.08	
18-26	B22	52.44	41.40	6.16	4.64	7.84	10.40	15.98	13.58	28.11	13.29	
26-34	B3	62.95	32.32	4.73	5.93	9.32	12.50	19.79	15.41	21.77	10.55	
34-41	C	54.57	33.75	1.68	4.47	8.68	13.13	21.25	17.04	22.74	11.01	
WATER CONTENT												
Depth (In.)	Horizon	Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.			
0-13	Ap&A2	38.8	35.9	27.0	25.3	24.8	13.7	11.9	11.4	1.12	0.17	5.100
13-18	B21	42.5	38.8	26.4	21.7	21.1	11.7	10.6	9.0	1.10	0.19	4.047
18-26	B22	34.7	28.1	17.6	15.0	14.1	7.4	6.7	5.6	1.13	0.14	3.690
26-34	B3	19.2	15.1	8.5	7.3	6.5	4.1	3.5	3.1	1.35	0.07	4.010
34-41	C	16.6	14.0	7.4	5.7	5.3	2.0	1.8	1.5	1.53	0.09	3.792
COARSE FRAGMENTS												
Depth (In.)	Horizon	Percent by Volume									TOTAL	
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.- 2 mm.			
0-13	Ap&A2			0.9	1.0	0.5	0.6	1.2	1.8	6.0		
13-18	B21	10.4	3.7	1.2	1.2	0.8	0.6	1.4	2.3	21.6		
18-26	B22		3.0	1.0	2.8	0.8	1.3	2.4	3.5	14.8		
26-34	B3	8.1	0.3	2.7	2.5	1.6	2.5	3.4	6.4	27.5		
34-41	C	2.3	3.3	0.7	2.8	1.5	2.0	2.6	3.7	18.9		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Acidity							
0-13	Ap&A2	2.94	4.6	5.3	meq./100 g.					23.7		
13-18	B21	1.28	5.2	5.85	3.4	0.8	0.1	0.3	14.8	19.4		
18-26	B22	0.70	5.45	6.1	1.7	0.4	<0.1	<0.1	12.2	14.5		
26-34	B3	0.25	5.4	6.05	1.1	0.2	<0.1	<0.1	9.3	10.8		
34-41	C	0.07	5.3	6.0	0.5	0.1	<0.1	<0.1	4.8	5.6		
					0.2	<0.1	<0.1	<0.1	2.2	2.7		

CHARLTON SOIL SERIES

Site 2

Location: North Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A ₁	0-3"	Dark brown (10YR 3/3) fine sandy loam; moderate, fine, granular structure; friable; abundant roots; abrupt, smooth boundary. (3-5 inches thick)
B ₂₁	3-15"	Yellowish brown (10YR 5/6) fine sandy loam; weak, fine, granular structure; friable; abundant roots; clear, smooth boundary. (10-15 inches thick)
B ₂₂	15-21"	Light olive brown (2.5Y 5/4) fine sandy loam; weak, medium to fine, granular structure; friable; roots common; clear wavy boundary. (3-7 inches thick)
B ₃	21-25"	Olive (5Y 5/3) fine sandy loam; weak, medium to fine, granular structure; friable; clear, smooth boundary. (2-5 inches thick)
C ₁	25-34"	Olive (5Y 4/4) crushed ped olive (5Y 5/3) loam; moderate, medium, subangular blocky structure; friable with firm peds; many rotten granite and schistose fragments that break down to medium and coarse sand when removed; gradual, smooth boundary. (8-14 inches thick)
C ₂	34-60"	Olive (5Y 4/3) crushed color olive (5Y 5/3) fine sandy loam; weak, medium and coarse, platy structure; slightly firm; many rotten rock fragments same as C ₁ .

Soil Series

Charlton

Site No. 2

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT	
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)
Percent of <2mm.											
0-3	A1	51.89	43.19	4.92	2.77	3.84	6.92	20.50	17.86	23.28	19.91
3-15	B21	55.51	39.96	4.53	3.64	4.21	7.97	22.38	17.31	21.70	18.26
15-21	B22	60.40	36.80	2.80	3.64	5.09	9.46	24.21	18.00	20.21	16.59
21-25	B3	52.06	44.21	3.73	5.23	7.07	8.91	16.96	13.89	24.45	19.76
25-34	C1	48.83	42.62	8.55	4.38	5.40	8.00	16.84	14.21	20.29	22.33
34-40	C2	50.30	41.88	7.82	3.42	5.27	7.93	18.51	15.17	21.67	20.21

Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0' pct.	15.0 pct.					
0-3	A1	61.3	52.9	41.3	40.3	40.0	20.1	19.8	19.4	0.75	0.17	11.983
3-15	B21	49.3	45.5	34.4	30.0	28.2	15.8	13.7	12.0	1.07	0.24	4.484
15-21	B22	40.0	35.6	25.1	22.5	21.0	12.3	11.1	10.3	0.97	0.14	11.703
21-25	B3	21.7	20.2	14.5	10.9	9.5	5.9	4.7	3.6	1.33	0.14	1.152
25-34	C1	16.7	15.4	13.7	12.6	11.8	7.3	6.2	4.6	1.70	0.15	0.270
34-40	C2	19.6	18.3	15.7	13.8	11.8	6.8	5.7	4.3	1.50	0.17	0.298

Depth (In.)	Horizon	COARSE FRAGMENTS								.25 in. - 2 mm.	TOTAL
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches			
0-3	A1				0.2	<0.1	0.1	0.2	0.3	0.9	
3-15	B21		0.6	1.2	1.4	1.1	1.5	3.0	4.5	13.3	
15-21	B22	31.2	0.3	0.3	2.7	1.8	2.0	3.3	5.1	46.7	
21-25	B3				1.3	1.1	1.0	2.2	6.4	12.0	
25-34	C1	0.9	0.6	1.0	0.8	1.2	1.7	2.2	6.2	14.6	
34-40	C2	1.3	0.6	0.2	0.4	0.3	0.5	0.7	1.5	5.5	

Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases					CEC (Sum)	Base Saturation (Sum) pct.
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Acidity							
					Ca	Mg	Na	K				
0-3	A1	4.36	6.6	7.05	meq./100 g.					22.6	63.3	
3-15	B21	1.88	6.0	6.3	1.0	5.4	<0.1	0.0	0.0	0.0	17.9	25.1
15-21	B22	0.99	5.65	5.95	1.4	0.7	<0.1	0.0	0.0	0.0	13.6	15.4
21-25	B3	0.32	5.55	5.85	0.3	0.3	<0.1	0.0	0.0	0.0	12.0	22.0
25-34	C1	0.17	5.35	5.7	1.3	0.5	<0.1	0.0	0.0	0.0	53.3	53.3
34-40	C2	0.12	5.25	5.7	1.5	0.4	<0.1	0.0	0.0	0.0	52.4	52.4

CHARLTON SOIL SERIES

Site 3

Location: Readfield, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-8"	Brown (10YR 4/3) fine sandy loam; moderate, medium, granular structure; friable; many roots; abrupt, smooth boundary. (8-9 inches thick)
B ₂₁	8-15"	Yellowish brown (10YR 5/6) sandy loam; weak, fine, granular structure; friable; abundant roots; gradual, wavy boundary. (4-8 inches thick)
B ₂₂	15-22"	Light olive brown (2.5Y 5/4) fine sandy loam; weak, fine, granular structure; friable; abundant roots; clear, wavy boundary; (6-10 inches thick)
B ₂₃	22-32"	Dark grayish brown (2.5Y 4/2) fine sandy loam; weak, medium, platy structure; friable; abundant roots; red (2.5YR 5/6) stains around stones 3 to 50 mm in diameter; clear, wavy boundary; (8-11 inches thick).
C	32-40"	Olive gray (5Y 5/2) gravelly loamy sand; single grain structure; firm in place, loose when removed.

Soil Series Charlton

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-8	Ap	50.60	42.28	7.12	5.77	9.11	9.08	13.85	12.79	28.75	13.53	
8-15	B21	61.52	33.82	4.66	8.02	11.62	10.64	16.80	14.44	23.36	10.46	
15-22	B22	61.62	34.64	3.74	5.71	8.77	10.75	19.56	16.83	23.50	11.14	
22-32	B23	64.10	32.42	3.48	3.73	7.12	11.45	23.04	18.76	23.19	9.23	
32-40	C	70.08	26.67	3.25	6.12	9.27	13.19	23.84	17.66	19.47	7.20	
WATER CONTENT												
Depth (In.)	Horizon	Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0' pct.	15.0 pct.			
0-8	Ap	39.7	34.7	25.9	25.0	23.8	12.1	10.5	9.8	1.11	0.18	4.784
8-15	B21	23.6	18.8	12.2	11.1	10.7	6.6	5.7	5.1	1.20	0.08	22.392
15-22	B22	23.6	18.8	11.3	9.6	8.8	4.5	3.9	3.5	1.22	0.10	10.316
22-32	B23	17.7	13.6	7.8	6.0	5.4	2.9	2.2	1.9	1.43	0.08	3.000
32-40	C	14.2	11.6	6.3	5.5	4.6	1.8	1.5	1.3	1.51	0.08	3.052
COARSE FRAGMENTS												
Depth (In.)	Horizon	Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL		
0-8	Ap				0.2	0.8	1.6	2.3	2.3	7.2		
8-15	B21			0.3	0.5	2.2	3.7	5.9	6.0	18.6		
15-22	B22		1.1		4.1	3.6	4.2	3.7	3.3	20.0		
22-32	B23	5.4	5.2	3.2	5.0	3.1	2.3	2.4	2.8	29.4		
32-40	C	12.0	6.8	2.0	3.3	2.4	2.0	2.7	3.5	34.7		
Depth (In.)	Horizon	Organic Carbon pct.	pH		Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.		
			.01M CaCl ₂	H ₂ O 1:1	Ca	Mg	Na	K				
0-8	Ap	3.12	4.55	5.05	meq./100 g.				14.2			
8-15	B21	0.91	5.05	5.55	2.1	0.1	<0.1	0.2	15.1	14.9		
15-22	B22	0.47	5.2	5.75	0.5	<0.1	0.4	0.3	7.4	26.2		
22-32	B23	0.19	5.3	5.65	0.4	<0.1	0.8	0.4	4.8	6.5		
32-40	C	0.13	5.3	5.65	0.2	<0.1	<0.1	0.2	2.5	3.1		
					<0.1	<0.1	<0.1	<0.1	1.5	1.9		

CHARLTON SOIL SERIES

Site 4

Location: Winthrop, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-8"	Dark brown (10YR 3/3) fine sandy loam; weak, fine, granular structure; friable; abundant roots; abrupt, wavy boundary. (7-9 inches thick)
B ₂₁	8-14"	Light olive brown (2.5Y 5/6) fine sandy loam; weak, fine, granular structure; friable; roots common; clear, wavy boundary. (5-7 inches thick)
B ₂₂	14-26"	Light olive brown (2.5Y 5/6) fine sandy loam; weak, fine, granular structure; friable; roots common; large rotten stone, very dark grayish brown (10YR 3/2); clear, wavy boundary. (11-13 inches thick)
B ₂₃	26-32"	Light olive brown (2.5Y 5/4) sandy loam; grain structure; friable; roots common; rotten stone present; clear wavy boundary. (5-7 inches thick)
C	32-44"	Olive (5Y 5/3) sandy loam; weak, fine to medium, platy structure; firm in place, friable when removed; rotten stone present.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT	
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)
Percent of <2mm.											
0-8	Ap	46.63	45.81	7.56	5.70	9.14	9.68	11.59	10.52	28.42	17.39
8-14	B21	50.09	44.88	5.03	5.60	9.22	10.02	12.81	12.44	31.51	13.37
14-26	B22	59.80	36.01	4.19	4.31	8.76	11.27	19.80	15.66	25.14	10.87
26-32	B23	72.34	24.18	3.48	6.22	10.58	15.24	24.40	15.90	17.19	6.99
32-40	C	77.60	19.65	2.75	4.84	10.38	19.16	28.18	15.04	14.43	5.22

Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.					
0-8	Ap	40.8	36.2	29.2	28.1	27.5	15.2	14.1	13.6	0.96	0.15	10.081
8-14	B21	37.1	32.1	23.1	20.6	19.6	10.1	9.3	8.1	1.14	0.17	5.296
14-26	B22	28.7	25.0	17.0	15.5	14.4	7.5	6.8	5.4	1.13	0.13	8.019
26-32	B23	19.8	16.1	10.7	9.8	9.3	5.3	4.7	4.0	1.24	0.08	7.753
32-40	C	9.9	8.1	5.2	4.8	4.3	2.5	2.2	1.9	1.60	0.05	3.160

Depth (In.)	Horizon	COARSE FRAGMENTS Percent by Volume								
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL
0-8	Ap		0.7	2.3	2.3	1.7	1.4	1.7	1.8	11.9
8-14	B21		3.6	1.7	3.5	2.0	2.0	3.8	3.6	20.2
14-26	B22	8.8	5.5	2.6	3.6	2.1	2.2	3.5	3.7	32.0
22-32	B23		5.2	2.4	3.6	1.6	2.6	5.4	5.1	25.9
32-40	C		2.2	1.0	0.7	0.6	0.7	2.4	4.3	11.9

Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				Acidity	CEC (Sum)	Base Saturation (Sum) pct.
			.01M CaCl ₂	H ₂ O		Ca	Mg	Na	K			
			2:1	1:1		meq./100 g.						
0-8	Ap	3.48	4.45	5.2							9.3	
8-14	B21	1.18	4.95	5.4	1.4	0.1	<0.1	<0.1	16.5	18.2	6.6	
14-26	B22	0.73	5.15	5.5	0.3	<0.1	<0.1	<0.1	11.4	12.2	6.3	
22-32	B23	0.48	5.25	5.6	0.3	<0.1	<0.1	<0.1	8.9	9.5	8.6	
32-40	C	0.16	5.3	5.65	<0.1	<0.1	<0.1	<0.1	7.0	7.6	12.1	
									2.9	3.3		

CHARLTON SOIL SERIES

Site 5

Location: Fayette, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-6"	Dark brown (10Y 4/3) fine sandy loam; medium, fine, granular structure; friable; abundant roots; abrupt, smooth boundary. (5-7 inches thick)
B ₂₁	6-11"	Strong brown (7.5YR 5/6) fine sandy loam; medium, fine, granular structure; friable; abundant roots; clear, smooth boundary. (4-6 inches thick)
B ₂₂	11-22"	Light olive brown (2.5Y 5/4) sandy loam; weak, medium, granular structure; friable; abundant roots; iron stains on rocks are yellowish red (5YR 5/8); gradual, smooth boundary. (10-13 inches thick)
C	22-42"	Olive (5Y 5/3) gravelly fine sandy loam; moderate, fine to medium, platy structure; firm in place, friable when removed; few roots; a zone of light olive brown (2.5Y 5/4) old root channels at 30 inches varying in thickness of 0-3 inches; rotten rocks 5-8 inches in diameter are schist with quartz grains scattered throughout the schist; some rocks 1-5 inches in diameter are coated with yellowish red stains, coats not thick but do completely cover these rocks; small stones (5-15 mm in diameter) crumble to sand.

Soil Series CharltonSite No. 5

Depth (In.)	Horizon	SIZE CLASS AND PARTICLE DIAMETER (mm)										
		TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
0-6	Ap	51.93	41.64	6.43	4.07	7.31	9.83	17.10	13.62	26.67	14.97	
6-11	B21	60.80	34.62	4.58	5.40	9.39	12.91	20.08	13.02	21.52	13.10	
11-22	B22	72.95	23.29	3.76	6.67	16.34	13.85	23.21	12.88	9.44	13.85	
22-42	C	69.42	25.99	4.59	5.06	9.45	14.39	24.80	15.72	15.06	10.93	
		Percent of <2mm.										
Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 ' pct.	15.0 pct.			
0-6	Ap	36.3	32.1	21.2	19.4	18.7	13.6	13.3	12.5	0.94	0.08	16.852
6-11	B21	31.1	27.5	17.8	16.9	16.0	8.8	8.4	7.4	1.12	0.12	20.718
11-22	B22	21.4	17.6	11.2	10.1	9.6	5.9	5.4	4.2	1.32	0.09	18.953
22-42	C	15.7	14.0	9.4	7.6	6.9	3.0	2.6	1.8	1.53	0.12	3.365
Depth (In.)	Horizon	COARSE FRAGMENTS										
		Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL		
0-6	Ap			0.6	0.6	0.6	1.0	2.0	2.9	7.7		
6-11	B21				1.3	1.1	1.7	3.2	5.4	12.7		
11-22	B22	1.6	3.0	2.0	3.3	2.1	2.9	5.5	7.0	27.4		
22-42	C	2.8	0.5	0.5	1.1	0.8	1.3	2.1	3.1	12.2		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂ 2:l	CaCl ₂ 1:l	H ₂ O 1:l	Bases						Acidity
						Ca	Mg	Na	K			
			meq./100 g.									
0-6	Ap	3.48	5.65	6.2	6.0	3.1	0.1	0.5	11.2	20.9	46.4	
6-11	B21	1.04	5.35	5.9	1.4	0.5	<0.1	0.2	10.2	12.4	17.7	
11-22	B22	0.41	5.45	5.9	0.4	0.2	<0.1	<0.1	5.7	6.5	14.0	
22-42	C	0.98	5.4	5.9	<0.1	<0.1	<0.1	<0.1	2.2	2.6	15.4	

SUTTON SOIL SERIES

Site 1

Location: Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-12"	Dark brown (10YR 3/3) silt loam; weak, fine, granular structure; friable; abundant roots; clear, smooth boundary. (6-12 inches thick)
A ₂	11-12"	Gray (10YR 5/1-6/1) silt loam; weak, fine, granular structure; friable; abundant roots; clear, discontinuous boundary. (0-4 inches thick)
B ₂₁	12-14"	Dark reddish brown (5YR 3/4) fine sandy loam; weak, fine, granular structure; friable; abundant roots; clear, discontinuous boundary. (0-3 inches thick)
B ₂₂	12-21"	Olive brown (2.5Y 4/4) fine sandy loam; weak, medium, granular structure; friable; abundant roots; gradual, smooth boundary. (4-10 inches thick)
B ₂₃	21-25"	Light olive brown (2.5Y 5/4) fine, sandy loam with coarse distinct mottles, grayish brown (2.5Y 5/2) and olive gray (5Y 5/2), weak medium, granular structure; friable; abundant roots; clear, irregular boundary. (4-8 inches thick)
B ₃	25-38"	Olive (5Y 5/3) fine, sandy loam with many medium prominent mottles, gray (5Y 5/1) yellowish brown (10YR 5/6) and dark brown (7.5YR 4/4) weak, medium, granular structure; friable; few roots; clear, smooth boundary. (8-15 inches thick)
C	38-44"	Olive gray (5Y 5/2) fine, sandy loam with prominent mottles, yellowish red (5YR 5/6) dark reddish brown (5YR 3/4-3/2) and gray (5Y 5/1) weak, medium granular structure; friable; few roots; many rotten granite and schistose rocks that break down into medium and coarse sand when

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT	
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)
Percent of <2mm.											
0-12	Ap&A2	40.32	52.53	7.15	3.96	5.30	7.08	12.24	11.74	32.41	20.12
12-21	B21&B22	48.44	47.14	4.42	3.96	6.87	9.16	14.69	13.76	26.80	20.34
21-25	B23	55.42	40.88	3.70	3.68	6.93	10.38	19.08	15.35	23.20	17.68
25-38	B3	57.90	37.25	4.85	2.55	5.78	10.37	21.04	18.16	24.42	12.83
38-43	C	64.32	30.65	5.03	3.25	6.96	11.41	24.19	18.51	19.93	10.72

Depth (In.)	Horizon	WATER CONTENT								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement ² cm./hr.
		Bar Pressures										
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.			
0-12	Ap&A2	54.5	52.1	46.0	43.9	42.7	16.9	14.5	12.2	0.92	0.31	0.586
12-21	B21&B22	50.9	45.4	33.7	30.2	29.6	11.7	9.1	7.6	1.04	0.27	0.994
21-25	B23	34.8	31.0	25.3	19.6	18.1	7.0	5.6	4.4	1.16	0.24	1.449
25-38	B3	20.1	18.3	12.4	10.8	10.0	4.4	3.4	2.2	1.55	0.16	0.376
38-43	C	16.8	15.0	8.8	7.1	6.5	3.8	2.7	1.8	1.61	0.11	0.286

Depth (In.)	Horizon	COARSE FRAGMENTS									TOTAL
		Percent by Volume									
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.		
0-12	Ap&A2			0.9	0.5	0.7	0.7	1.0	1.7	5.5	
12-21	B21&B22		1.2	1.0	0.9	0.9	0.9	1.7	2.5	9.1	
21-25	B23		6.4	0.9	1.1	0.9	1.2	2.2	3.6	16.3	
25-38	B3	3.9	0.9	1.5	1.9	1.0	1.3	2.1	2.9	15.5	
38-43	C		1.5	1.0	1.7	1.3	1.2	2.4	3.8	12.9	

Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable					CEC (Sum)	Base Saturation (Sum) pct.
			.01M CaCl ₂ 2:1	CaCl ₂ 1:1	H ₂ O 1:1	Bases			Acidity			
						Ca	Mg	Na K				
0-12	Ap&A2	3.59	5.15	5.85	← meq./100 g. →						29.0	
12-21	B21&B22	1.19	5.35	5.9	5.0	1.2	0.1	0.2	15.9		22.4	14.3
21-25	B23	0.57	5.6	6.0	1.3	0.5	0.1	0.1	12.0		14.0	12.2
25-38	B3	0.21	5.45	5.85	0.5	0.3	<0.1	<0.1	7.2		4.1	9.8
38-43	C	0.11	5.5	5.8	0.1	0.2	<0.1	<0.1	3.8		4.3	11.6

SUTTON SOIL SERIES

Site 2

Location: North Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-5"	Dark yellowish brown (10YR 4/4) fine, sandy loam; moderate, medium, granular structure; friable; abundant roots; clear, smooth boundary. (4-7 inches thick)
B ₂₁	5-6"	Yellowish brown (10YR 5/6) fine, sandy loam; weak, fine, granular structure; friable; abundant roots; clear, discontinuous boundary. (0-10 inches thick)
B ₂₂	5-15"	Light olive brown (2.5Y 5/6) silt loam; weak, fine, granular structure; friable; abundant roots; gradual, smooth boundary. (8-12 inches thick)
B ₂₃	15-24"	Olive brown (2.5Y 4/4) loam with many coarse, prominent mottles, olive gray (5Y 5/2) and dark yellowish brown (10YR 4/4); weak, medium and coarse, platy structure; friable; few roots; clear, wavy boundary. (7-12 inches thick). Tops of coarse prismatic structure in this horizon.
C	24-40"	Dark grayish brown (2.5Y 4/2) loam with many coarse, prominent mottles, olive gray (5Y 4/2), gray (5Y 5/1) dark yellowish brown (10YR 4/4) and light olive brown (2.5Y 5/6), very coarse prismatic structure breaking to weak, medium and coarse, platy structure; friable; many weathered rock fragments that break down to medium and coarse sand when removed.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-5	Ap	50.10	42.38	7.52	3.51	4.40	7.24	19.72	15.23	25.43	16.95	
5-15	B21&B22	41.09	53.17	5.74	2.15	3.52	6.35	15.19	13.88	29.60	23.57	
15-24	B23	42.23	48.74	9.03	3.80	6.58	6.38	13.97	12.50	24.29	24.45	
24-40	C	43.68	46.10	10.22	4.24	6.10	7.64	14.05	11.65	19.74	26.36	
Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures								Bulk Density q./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.					
0-5	Ap	43.7	42.0	36.9	33.9	32.8	18.4	15.4	13.7	0.80	0.18	8.030
5-15	B21&B22	30.2	29.4	25.2	23.1	22.6	10.3	7.2	5.4	1.36	0.27	0.220
15-24	B23	17.9	17.6	15.4	13.9	12.8	7.6	6.1	4.6	1.75	0.19	0.300
24-40	C	17.2	16.8	15.3	14.0	12.3	8.3	6.8	5.2	1.72	0.17	0.056
Depth (In.)	Horizon	COARSE FRAGMENTS										
		Percent by Volume									TOTAL	
3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.					
0-5	Ap		0.7		1.0	0.8	1.0	0.8	1.8	6.1		
5-15	B21&B22			0.6	0.4	0.8	1.1	1.6	2.3	6.8		
15-24	B23		0.5		0.8	0.7	0.8	1.8	4.3	8.9		
24-40	C	6.6	3.5	0.7	0.7	0.7	0.8	1.2	1.9	16.1		
Depth (In.)	Horizon	Organic Carbon pct.	pH		Extractable				CEC (Sum)	Base Saturation (Sum) pct.		
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Bases		Acidity					
			Ca	Mg	Na	K						
meq./100 g.												
0-5	Ap	3.99	4.6	5.35	2.6	0.6	<0.1	0.6	18.6	17.3		
5-15	B21&B22	0.84	4.75	5.1	0.4	0.1	0.1	0.2	10.6	7.0		
15-24	B23	0.15	4.85	5.3	1.9	0.5	0.1	<0.1	4.9	34.7		
24-40	C	0.11	5.15	5.7	4.6	1.0	0.1	0.1	3.5	62.4		

SUTTON SOIL SERIES

Site 3

Location: East Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-8"	Dark brown (7.5YR 3/2) fine, sandy loam; weak, fine, granular structure; friable; abundant roots; abrupt, wavy boundary. (7-10 inches thick)
B ₂₁	0-13"	Strong brown (7.5YR 5/6) sandy loam; weak, fine, granular structure; friable; few roots; clear, wavy boundary. (4-7 inches thick)
B ₂₂	13-21"	Light olive brown (2.5Y 5/4) sandy loam with few fine, faint mottles, light yellowish brown (2.5Y 6/4); weak, fine, granular structure; friable; few roots; clear, smooth boundary. (7-10 inches thick)
B ₂₃	21-40"	Light olive brown (2.5Y 5/4) fine, sandy loam with common medium, distinct mottles, strong brown (7.5Y 5/8) and yellow brown (10YR 5/4); moderate, medium, platy structure; friable; many rotten schistose fragments; polygons gray (5Y 6/1); gradual, smooth boundary. (18-23 inches thick)
C	40-60"	Olive (5Y 5/4) fine, sandy loam with common medium distinct mottles, olive gray (5Y 5/2), light olive brown (2.5Y 5/6) and brownish yellow (10YR 6/8); moderate, medium, platy structure; friable; rotten fragments present.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL				SAND					SILT	
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-8	Ap	55.07	38.67	6.26	3.92	8.57	12.49	16.52	13.57	23.41	15.26	
8-13	B21	64.19	31.25	4.56	6.91	11.49	16.63	16.92	12.24	19.44	11.81	
13-21	B22	65.10	30.99	3.91	4.95	9.71	16.73	20.09	13.62	18.55	12.44	
21-40	B3	54.61	38.55	6.82	2.45	5.56	11.07	20.10	15.45	22.15	16.40	
40-45	C	53.21	40.87	5.92	1.58	4.95	11.72	19.73	15.23	23.07	17.80	
Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.					
0-8	Ap	33.9	30.0	24.5	22.7	22.0	12.8	12.2	11.1	0.96	0.13	22.968
8-13	B21	25.7	22.2	15.9	13.3	12.6	6.9	6.2	5.2	1.23	0.13	6.846
13-21	B22	22.4	19.8	13.8	11.3	10.8	5.4	4.5	3.4	1.33	0.14	6.976
21-40	B3	14.6	13.9	11.7	10.0	9.5	6.0	4.7	3.4	1.76	0.15	0.094
40-45	C	14.4	13.4	11.7	10.0	8.9	5.6	4.5	3.0	1.78	0.15	0.042
Depth (In.)	Horizon	COARSE FRAGMENTS										
		Percent by Volume									TOTAL	
3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.					
0-8	Ap	6.4	1.5	0.5	1.0	1.2	1.0	2.0	2.4	16.0		
8-13	B21		2.2	2.0	2.8	1.6	1.4	1.8	3.0	14.8		
13-21	B22				0.6	0.5	0.6	1.3	2.8	5.8		
21-40	B3		0.7	0.4	0.2	0.2	0.3	0.6	2.4	4.8		
40-45	C				0.8	0.1	0.3	0.4	1.8	3.4		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Acidity							
0-8	Ap	2.72	4.75	5.45	← meq./100 g. →				18.8			
8-13	B21	0.97	5.05	5.65	1.3	0.1	1.4	0.3	13.4	16.5	11.3	
13-21	B22	0.42	5.3	5.85	0.8	<0.1	0.1	<0.1	8.6	9.7	10.3	
21-40	B3	0.13	5.65	6.1	0.4	<0.1	<0.1	<0.1	6.1	6.8	48.0	
40-45	C	0.20	6.0	6.6	2.0	0.2	0.1	<0.1	2.6	5.0	67.3	
					2.8	0.3	0.1	<0.1	1.6	4.9		

SUTTON SOIL SERIES

Site 4

Location: Winthrop, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-7"	Dark brown (10YR 4/3) sandy loam; moderate, fine to medium granular structure; friable; abundant roots; abrupt, wavy boundary. (5-8 inches thick)
B ₂₁	7-21"	Yellowish brown (10YR 5/6) with pockets of strong brown (7.5YR 5/6) fine, sandy loam; weak, fine, granular structure; friable; abundant roots; abrupt, irregular boundary. (9-14 inches thick)
B ₂₂	21-23"	Light olive brown (2.5Y 5/4) loamy sand with common medium distinct mottles, light brownish gray (2.5Y 6/2), dark yellowish brown (10YR 4/4) and yellowish red (5YR 5/8); weak, fine, granular structure; friable; roots common; abrupt, smooth boundary. (4-6 inches thick)
C	23-47"	Pale olive (5Y 6/3) fine, sandy loam with prominent mottles, yellowish red (5YR 4/8) and strong brown (7.5YR 5/8); weak, fine to medium, platy structure; firm in place, friable when removed; trace of roots.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-7	Ap	58.72	35.95	5.33	9.38	14.40	12.13	12.71	10.10	23.36	12.59	
7-21	B21	48.18	45.13	6.69	7.23	13.70	10.20	8.53	8.52	28.21	16.92	
21-23	B22	73.91	22.85	3.24	4.50	9.13	15.00	27.97	17.31	16.59	6.26	
23-40	C	71.88	25.06	3.06	4.70	8.05	13.99	27.46	17.68	18.46	6.60	
Depth (In.)	Horizon	WATER CONTENT								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		Bar Pressures										
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.			
0-7	Ap	35.0	33.0	27.8	26.3	25.5	15.2	12.1	11.7	1.03	0.16	16.783
7-21	B21	32.1	30.7	25.7	22.2	20.6	11.3	8.7	7.6	1.34	0.24	0.478
21-23	B22	18.3	15.4	10.0	9.4	9.0	3.8	3.4	3.2	1.46	0.10	8.053
23-40	C	15.8	13.6	8.0	7.0	6.6	2.1	1.8	1.7	1.60	0.10	1.019
Depth (In.)	Horizon	COARSE FRAGMENTS									TOTAL	
		Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.			
0-7	Ap			1.4	1.1	1.0	1.4	2.4	3.2	10.5		
7-21	B21		0.2	0.7	2.2	1.6	2.2	3.5	4.5	14.9		
21-23	B22					0.2	1.2	3.9	6.7	12.0		
23-40	C			0.1	0.2	0.6	1.4	3.4	4.0	9.7		
Depth (In.)	Horizon	Organic Carbon pct.	pH		Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.		
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Ca	Mg	Na	K				
meq./100 g.												
0-7	Ap	3.19	4.85	5.5	2.7	0.2	0.1	0.3	16.1	19.4	17.0	
7-21	B21	1.00	4.95	5.5	0.4	<0.1	<0.1	<0.1	12.0	12.7	5.8	
21-23	B22	0.43	4.9	5.35	<0.1	<0.1	<0.1	<0.1	7.1	7.5	5.3	
23-40	C	0.13	5.15	5.45	<0.1	<0.1	<0.1	<0.1	2.6	3.0	13.3	

SUTTON SOIL SERIES

Site 5

Location: East Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-12"	Dark brown (10YR 3/3) fine, sandy loam; weak, fine, granular structure; friable; abundant roots; abrupt, wavy boundary. (10-12 inches thick)
B ₂₁	12-19"	Yellowish brown (10YR 5/6) sandy loam; weak, fine, granular structure; friable; roots common; clear, smooth boundary. (6-10 inches thick)
B ₂₂	19-30"	Olive brown (2.5Y 4/4) fine, sandy loam with few fine distinct mottles, yellowish brown (10YR 5/8); moderate, medium, platy structure; friable; few roots; clear, smooth boundary. (10-12 inches thick)
C	30-48"	Olive (5Y 5/4) fine, sandy loam with common medium prominent mottles, strong brown (7.5YR 5/8); massive, single grain; firm in place, friable when removed; rotten stones present.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND				SILT			
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-12	Ap	58.02	34.12	7.86	4.24	10.10	13.46	17.88	12.34	22.63	11.49	
12-20	B21	65.18	30.15	4.67	5.52	10.89	13.71	20.37	14.69	20.59	9.56	
20-27	B22	66.60	29.72	3.68	4.78	9.67	13.02	21.78	17.35	19.79	9.93	
27-48	C	67.77	29.01	3.22	4.93	9.52	14.02	22.34	16.96	18.84	10.17	
Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures										
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0' pct.	15.0 pct.	Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
0-12	Ap	34.5	31.8	26.2	25.0	24.3	15.6	13.8	13.7	1.01	0.13	11.769
12-20	B21	33.1	28.4	20.8	18.0	16.7	11.0	9.5	8.8	1.07	0.13	22.692
20-27	B22	23.8	20.6	13.6	12.1	11.5	5.7	5.0	4.4	1.28	0.12	4.134
27-48	C	15.8	14.2	8.7	6.8	5.7	3.8	2.9	2.3	1.61	0.10	0.946
Depth (In.)	Horizon	COARSE FRAGMENTS										
		Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL		
0-12	Ap		0.6	0.2	0.9	0.8	0.7	1.3	2.2	6.7		
12-20	B21		1.3	1.6	2.1	1.2	1.3	2.2	3.3	13.0		
20-27	B22		2.1		1.5	1.2	1.2	2.4	3.4	11.8		
27-48	C	10.3	0.6	0.8	1.4	0.7	1.2	2.2	3.5	20.7		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂ 2:1	H ₂ O 1:1		Ca	Mg	Na	K			
meq./100 g.												
0-12	Ap	2.76	4.85	5.6	3.1	0.4	<0.1	0.2	17.3	21.1	18.0	
12-20	B21	1.19	5.15	5.8	1.2	0.2	<0.1	<0.1	14.0	15.6	10.2	
20-27	B22	0.51	5.25	5.8	0.4	<0.1	0.1	<0.1	7.1	7.8	9.0	
27-48	C	0.15	5.45	5.85	0.1	<0.1	0.1	<0.1	3.2	3.6	11.1	

PAXTON SOIL SERIES

Site 1

Location: Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-10"	Very dark grayish brown (10YR 3/2) loam; moderate, fine, granular structure; friable; abrupt, wavy boundary. (8-10 inches thick)
B ₂₁	10-14"	Dark brown (7.5YR 4/4) loam; weak, fine, granular structure; friable; clear, broken boundary. (0-4 inches thick)
B ₂₂	14-21"	Olive gray (5Y 4/2) fine sandy loam; weak, medium, granular structure; friable; clear, wavy boundary. (5-10 inches thick)
B ₃	21-26"	Olive gray (5Y 4/2) ped surface and olive (5Y 4/3) crushed ped color, loam; moderate, medium, platy structure; friable; gradual, smooth boundary. (5-10 inches thick) Tops of very coarse prismatic structure in the horizon.
C _{1x}	26-42	Olive gray (5Y 4/2) outside peds olive (5Y 4/3) crushed, loam; strong coarse platy structure; very firm; gradual smooth boundary. (10-20 inches thick) Few, coarse, prominent mottles olive (5Y 5/3) and gray (5Y 5/1) in loamy fine sand pockets along prism walls.
C _{2x}	42-60"+	Gray (5Y 5/1) outside peds olive (5Y 4/3) crushed color, loam; strong, coarse, platy structure; very firm. Many, fine, prominent mottles inside peds dark gray (10YR 4/1) and yellowish brown (10YR 5/6).

		SIZE CLASS AND PARTICLE DIAMETER (mm)										
Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-10	Ap	43.07	46.32	10.61	3.38	5.84	8.80	13.66	11.39	26.87	19.45	
10-14	B21	51.09	39.87	9.04	4.12	8.09	9.85	15.98	13.05	22.20	17.67	
14-21	B22	59.16	31.83	9.01	6.40	11.66	11.67	16.67	12.76	14.00	17.83	
21-26	B3	51.38	35.28	13.34	4.28	8.97	10.90	15.45	11.78	16.76	18.52	
26-42	Cx	48.01	35.93	16.06	3.58	7.16	10.31	15.70	11.26	19.52	16.41	
		WATER CONTENT										
Depth (In.)	Horizon	Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.			
0-10	Ap	43.8	38.7	36.6	35.6	34.9	13.8	12.4	11.0	1.09	0.28	0.217
10-14	B21	54.5	49.8	40.3	37.9	36.2	13.8	12.8	11.0	0.91	0.27	2.320
14-21	B22	30.0	26.6	21.6	20.3	19.6	9.8	8.8	7.0	1.22	0.18	2.345
21-26	B3	25.7	22.8	18.8	18.4	17.3	9.7	8.5	6.6	1.31	0.16	1.327
26-42	Cx	16.0	14.8	14.1	13.7	13.1	8.9	8.4	7.3	1.95	0.13	0.227
		COARSE FRAGMENTS Percent by Volume										
Depth (In.)	Horizon	3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL		
0-10	Ap				1.1	0.6	0.7	1.2	2.8	6.4		
10-14	B21				0.6	0.4	0.4	0.7	3.0	5.1		
14-21	B22				0.5	0.2	0.2	1.7	5.6	8.2		
21-26	B3				0.1	0.2	0.2	2.0	7.6	10.1		
26-42	Cx				0.3	0.3	0.4	0.6	3.1	4.7		
Depth (In.)	Horizon	Organic Carbon pct.	pH		Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.		
			.01M CaCl ₂	H ₂ O	Ca	Mg	Na	K				
0-10	Ap	2.76	5.2	5.9	meq./100 g.				35.5			
10-14	B21	1.68	5.1	5.75	5.7	0.7	0.1	0.5	12.7	17.4		
14-21	B22	0.47	5.1	5.75	2.2	0.4	<0.1	0.5	15.2	19.6		
21-26	B3	0.28	5.15	5.7	1.3	0.2	<0.1	0.6	9.0	11.2		
26-42	Cx	0.12	5.0	5.7	1.5	0.3	0.1	0.5	6.3	8.7		
					2.7	0.7	0.1	0.2	4.8	8.5		

PAXTON SOIL SERIES

Site 2

Location: South Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-7"	Dark brown (10YR 3/3) loam; moderate, medium, granular structure, friable; many roots, clear smooth boundary. (6-9 inches thick)
B ₂₁	7-12"	Yellowish brown (10YR 5/6) loam; weak, medium, granular structure, friable, many roots, clear, smooth boundary. (3-6 inches thick)
B ₂₂	12-17"	Light olive brown (2.5Y 5/4) fine sandy loam; weak, medium, granular structure, friable; many roots; clear, smooth boundary. (5-8 inches thick)
B ₃	17-23"	Olive (5Y 5/3) sand coatings on peds yellowish brown (10YR 5/6) sandy loam; moderate, medium, platy structure; firm; few roots; gradual, smooth boundary. (5-7 inches thick) The tops of large polygons are in this horizon.
C _{1x}	23-36"	Olive gray (5Y 4/2) matrix, ped coats olive brown (2.5Y 4/4) fine sandy loam; strong, medium, platy structure; very firm; peds brittle; gradual, smooth boundary. (9-15 inches thick)
C _{2x}	36-44"	Olive (5Y 4/3) ped coats dark grayish brown (10YR 4/2) fine sandy loam; strong, coarse, platy structure; very firm; peds brittle; abrupt, smooth boundary.
C _{3x}	44-48"+	Same color, structure, and texture but mottled common, coarse, prominent gray (5Y 5/1) (5Y 6/1) yellowish brown (10YR 5/6) (10YR 5/6) strong brown.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND						SILT	
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
		Percent of <2mm										
0-7	Ap	44.01	42.37	13.62	3.57	5.81	8.56	14.84	11.23	22.54	19.83	
7-12	B21	44.79	45.24	9.97	3.62	5.95	8.79	15.20	11.23	24.25	20.99	
12-17	B22	58.21	31.53	10.26	4.62	8.80	12.86	19.05	12.88	16.24	15.29	
17-23	B3	65.53	28.07	6.40	6.37	11.54	13.76	20.34	13.52	14.59	13.48	
23-36	C1x	53.71	34.58	11.71	5.04	8.60	10.18	16.47	13.42	18.31	16.27	
36-42	C2x	51.93	35.85	12.22	4.27	7.93	10.44	17.06	12.23	17.76	18.09	
Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures										
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0' pct.	15.0 pct.	Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
0-7	Ap	45.4	42.2	37.8	36.7	36.3	17.4	16.7	15.7	0.91	0.20	5.835
7-12	B21	37.0	34.3	28.9	28.2	26.6	13.6	13.0	11.6	1.04	0.18	8.056
12-17	B22	25.4	23.5	19.5	18.3	17.6	9.2	8.0	6.3	1.19	0.16	4.845
17-23	B3	15.8	14.7	12.6	11.9	11.7	7.4	6.5	4.6	1.63	0.13	0.887
23-36	C1x	15.9	15.1	13.9	13.4	13.1	9.4	8.7	6.3	1.70	0.13	0.478
36-42	C2x	16.4	15.9	14.7	14.2	13.8	9.9	8.1	6.7	1.71	0.14	0.050
Depth (In.)	Horizon	COARSE FRAGMENTS										
		Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.- 2 mm.	TOTAL		
0-7	Ap		0.6	0.4	0.2	0.3	0.4	0.8	1.5	4.2		
7-12	B21			0.3	0.3	0.2	0.2	1.1	3.0	5.1		
12-17	B22		2.2			<0.1	0.3	0.9	3.0	6.5		
17-23	B3			0.6	0.1	0.1	0.5	1.4	7.8	10.6		
23-36	C1x	19.7			<0.1	0.2	0.2	0.6	4.7	25.5		
36-42	C2x		1.9		0.5	0.2	0.5	1.0	4.8	8.9		
Depth (In.)	Horizon	Organic Carbon pct.	pH				Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.
			.01M CaCl ₂ 2:1		H ₂ O 1:1		Acidity					
			Ca	Mg	Na	K	meq./100 g.					
0-7	Ap	4.13	4.8	5.45	7.8	1.4	0.1	0.6	17.9	28.0	36.1	
7-12	B21	2.28	4.85	5.35	2.9	0.6	0.1	0.6	15.5	19.7	21.3	
12-17	B22	0.83	5.0	5.45	0.8	0.2	<0.1	0.4	9.8	11.3	13.3	
17-23	B3	0.30	5.0	5.4	0.7	0.2	0.1	0.4	6.4	7.8	17.9	
23-36	C1x	0.08	4.75	5.2	0.6	0.3	0.1	0.5	6.4	7.7	19.5	
36-42	C2x	0.06	4.75	5.35	1.3	0.4	0.1	0.3	5.2	7.3	28.8	

-65-

PAXTON SOIL SERIES

Site 3

Location: Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-7"	Dark yellowish brown (10YR 4/4) silt loam; moderate, fine and medium, granular structure; friable; abundant roots; abrupt, smooth boundary. (5-8 inches thick)
B ₂₁	7-8"	Dark brown (7.5YR 4/4) silt loam; weak, fine, granular structure; friable; abundant roots; clear, discontinuous boundary. (0-2 inches thick)
B ₂₂	7-15"	Yellowish brown (10YR 5/4) silt loam; weak, fine, granular structure; friable; abundant roots; clear, wavy boundary. (2-8 inches thick)
B ₂₃	15-22"	Light olive brown (2.5Y 5/4) and grayish brown (2.5Y 5/2) fine sandy loam; moderate, medium, subangular blocky structure; friable; few roots; gradual, irregular boundary (4-10 inches thick). Fine sand composed of rotten schists and coarse sand composed of granite in this horizon.
C _x	22-42"	Olive gray (5Y 4/2), sand coatings on ped surface are olive (5Y 5/6), polygon walls are olive (5Y 5/3), fine sandy loam. Strong, medium and coarse, platy structure; firm and brittle; few roots. Sand movement on ped surfaces, coarse prismatic structure with roots and evidence of water movement in this horizon. Increase in rotten rock below 42 inch depth.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
0-7	Ap	41.29	50.31	8.40	3.76	5.74	7.30	13.39	11.10	25.38	24.93	
7-15	B21&B22	41.05	51.25	7.70	2.87	5.14	7.25	13.61	12.18	24.90	26.35	
15-22	B23	49.51	44.08	6.41	4.51	6.21	8.77	17.05	12.97	21.48	22.60	
22-42	Cx	53.37	40.45	6.18	3.68	8.12	10.83	17.88	12.86	18.96	21.49	
Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.					
0-7	Ap	49.6	48.4	43.8	41.5	41.1	19.4	16.8	16.7	0.87	0.24	4.271
7-15	B21&B22	38.4	36.5	30.3	28.1	27.0	14.2	13.1	12.0	1.08	0.20	3.278
15-22	B23	23.8	23.3	18.4	16.9	14.9	10.3	7.8	6.1	1.29	0.16	4.432
22-42	Cx	15.7	15.3	14.0	13.1	12.3	9.0	7.0	5.3	1.68	0.15	0.118
Depth (In.)	Horizon	COARSE FRAGMENTS										
		Percent by Volume									TOTAL	
3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.- 2 mm.					
0-7	Ap			1.0	0.4	0.2	0.4	0.6	1.4	4.0		
7-15	B21&B22			0.4	0.6	0.2	0.4	1.6	3.1	6.3		
15-22	B23		1.3		0.2	0.3	0.5	1.5	4.9	8.7		
22-42	Cx			1.2	1.3	1.1	1.3	1.7	5.1	11.7		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Acidity							
			Ca	Mg	Na	K						
			meq./100 g.									
0-7	Ap	4.49	6.4	6.85	7.0	6.3	<0.1	0.7	8.1	22.2	63.5	
7-15	B21&B22	1.52	5.7	6.2	3.4	1.0	0.2	0.3	13.0	17.9	27.4	
15-22	B23	0.47	5.5	5.9	0.8	0.4	0.1	0.2	8.2	9.7	15.5	
22-42	Cx	0.14	5.3	5.7	0.5	0.3	0.1	0.2	5.9	7.0	15.7	

PAXTON SOIL SERIES

Site 4

Location: Readfield, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-8"	Dark yellowish brown (10YR 4/4), fine sandy loam; weak, fine, granular structure; friable; abundant roots; abrupt, smooth boundary. (6-9 inches thick)
B ₂₁	8-12"	Strong brown (7.5YR 5/6), fine sandy loam; weak, fine granular structure; friable; many roots; wavy, broken boundary. (0-4 inches thick)
B ₂₂	8-23"	Yellowish brown (10YR 5/6), fine sandy loam; weak, fine, granular structure; friable; many roots; clear, wavy boundary. (13-16 inches thick)
B ₃	23-31"	Light brownish gray (2.5Y 6/2) or grayish brown (2.5Y 5/2) fine sandy loam; moderate, medium, platy structure; friable; few roots; abrupt, wavy boundary; (6-8 inches thick).
C _x	31-50"	Dark brown (10YR 3/3) outside, and olive brown (2.5Y 4/4) inside of ped, fine sandy loam; strong, medium to coarse, platy structure, firm, brittle; no roots.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-8	Ap	46.72	46.32	6.96	3.65	6.47	8.75	16.03	11.82	24.98	21.34	
8-23	B21&B22	57.30	38.33	4.37	3.97	8.02	12.22	19.91	13.18	20.18	18.15	
23-31	B3	54.90	40.70	4.40	4.17	7.84	10.84	18.59	13.46	21.16	19.54	
31-40	Cx	54.84	38.84	6.32	4.77	7.62	10.85	18.57	13.03	19.43	19.41	
Depth (In.)	Horizon	WATER CONTENT								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		Bar Pressures										
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.			
0-8	Ap	36.5	32.6	26.1	23.8	23.2	16.2	13.4	12.8	0.94	0.12	4.310
8-23	B21&B22	24.0	21.0	15.4	13.6	13.4	9.0	6.9	6.0	1.18	0.11	2.281
23-31	B3	18.8	17.6	14.0	12.3	11.3	6.7	4.5	3.8	1.57	0.16	0.462
31-40	Cx	16.1	15.3	13.8	12.6	12.3	7.7	6.0	4.4	1.68	0.16	0.035
Depth (In.)	Horizon	COARSE FRAGMENTS									TOTAL	
		Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.			
0-8	Ap	2.9	1.3	0.8	2.0	1.7	1.3	2.2	3.5	15.7		
8-23	B21&B22	3.0	4.4	4.3	2.0	1.5	1.6	2.7	3.5	23.0		
23-31	B3	7.5	2.9	1.9	2.1	1.3	1.6	3.3	4.8	25.4		
31-40	Cx		2.5	0.4	1.1	0.7	1.5	2.2	6.8	15.2		
Depth (In.)	Horizon	Organic Carbon pct.	pH		Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.		
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Ca	Mg	Na	K				
			meq./100 g.									
0-8	Ap	2.94	4.5	5.25	1.6	0.1	0.4	0.3	15.2	17.6	13.6	
8-23	B21&B22	0.65	4.95	5.55	0.6	<0.1	0.1	<0.1	7.9	8.8	10.2	
23-31	B3	0.20	5.15	5.7	0.3	<0.1	0.5	0.2	4.4	5.5	20.0	
31-40	Cx	0.14	5.25	5.85	0.4	<0.1	0.1	0.1	4.8	5.5	12.7	

PAXTON SOIL SERIES

Site 5

Location: Kents Hill, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-9"	Brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; abundant roots; abrupt, smooth boundary. (8-10 inches thick)
B ₂₁	9-10"	Yellowish brown (10YR 5/6) fine sandy loam; weak, fine, granular structure; friable; abundant roots; abrupt, broken boundary. (0-2 inches thick)
B ₂₂	9-16"	Light olive brown (2.5Y 5/4) fine sandy loam; weak, fine, granular structure; friable; abundant roots; movement of A _p into this horizon via earthworm channels; gradual, wavy boundary. (6-12 inches thick)
B ₂₃	16-24"	Olive (5Y 5/3) fine sandy loam; weak, medium, platy to weak, medium, granular structure; friable; few roots; few small rotten rock fragments (sand or fine sand); clear, wavy boundary. (5-12 inches thick)
C _{1x}	24-34"	Olive gray (5Y 4/2) sandy loam; strong, thin, platy structure; firm; manganese stains 1-2 mm in diameter; few small rotten rock fragments (sand or fine sand); gravel has sand coatings; sand coatings on horizontal plate faces; roots few to 33", common in bottom inch of horizon; lower boundary is polygon tops; gradual smooth boundary. (10-15 inches thick)
C _{2x}	34-54"	Olive gray (5Y 5/2) fine sandy loam; strong, coarse prismatic primary structure with strong, fine and medium platy secondary structure; firm and brittle; roots common to 36 inches, trace below 36 inches; 2% of gravel is rotten,

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
0-9	Ap	42.17	50.68	7.15	2.76	5.48	8.20	13.52	12.21	30.80	19.88	
9-16	B21&B22	48.90	46.14	4.96	3.53	6.51	9.02	16.22	13.62	26.11	20.03	
16-24	B23	58.75	37.17	4.08	4.65	8.82	11.87	19.75	13.66	20.37	16.80	
24-34	Clx	67.29	29.97	2.74	5.02	11.65	15.88	21.66	13.08	13.16	16.81	
34-40	C2x	58.34	35.81	5.85	4.52	10.90	12.78	17.59	12.55	21.04	14.77	
WATER CONTENT												
Depth (In.)	Horizon	Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.			
0-9	Ap	49.6	47.5	43.4	42.4	41.8	20.0	16.3	12.1	0.92	0.29	0.468
9-16	B21&B22	29.7	27.0	21.0	19.4	18.1	10.5	9.2	7.9	1.24	0.16	0.631
16-24	B23	22.6	20.5	16.7	15.4	14.8	6.9	5.6	4.2	1.42	0.18	0.861
24-34	Clx	16.2	15.0	11.8	10.2	9.0	6.6	5.5	3.9	1.60	0.13	0.291
34-40	C2x	15.2	14.4	12.3	10.9	10.4	6.8	5.7	4.4	1.63	0.13	0.246
COARSE FRAGMENTS												
Depth (In.)	Horizon	Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL		
0-9	Ap											
9-16	B21&B22	4.5	0.8	0.5	0.9	0.4	0.5	0.8	1.4	5.3		
16-24	B23		0.6	0.1	0.4	0.4	1.1	2.8	5.4			
24-34	Clx			2.0	1.2	0.8	1.9	5.2	12.1			
34-40	C2x		1.1	0.2	0.3	0.5	0.7	5.7	10.2			
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂	H ₂ O		Ca	Mg	Na	K			
0-9	Ap	3.45	5.8	6.3	←	→	←	→	←	→		
9-16	B21&B22	0.63	5.55	6.1	6.5	1.2	0.2	0.6	11.3	19.8		
16-24	B23	0.20	5.55	5.9	1.3	0.3	0.2	0.3	8.2	10.3		
24-34	Clx	0.10	5.5	5.95	0.5	0.1	0.3	0.3	5.1	6.3		
34-40	C2x	0.08	5.35	5.85	0.4	0.1	0.2	0.2	4.5	5.4		
					0.6	0.1	0.2	0.3	4.7	5.9		

WOODBIDGE SOIL SERIES

Site 1

Location: Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-10"	Dark brown (10YR 3/3) loam; moderate, medium, granular structure; friable; clear, smooth boundary. (8-10 inches thick)
B ₂₁	10-15"	Brown (10YR 4/3) fine, sandy loam; weak, fine, granular structure; friable; clear, wavy boundary. (3-6 inches thick)
B ₂₂	15-24"	Dark grayish brown (2.5Y 4/2) fine, sandy loam with prominent mottles, olive gray (5Y 5/2) strong brown (7.5YR 5/6) weak, medium, platy structure; friable; gradual, wavy boundary. (5-12 inches thick). Tops of very large polygons in this horizon.
C _{1x}	24-40"	Olive (5Y 5/3) loam with many coarse prominent mottles of gray (5Y 5/1) dark brown (7.5YR 4/4); strong, coarse prismatic primary structure with strong, coarse, platy secondary structure; prism faces gray (5Y 5/1) very firm; brittle; gradual, smooth boundary. (12-20 inches thick)
C _{2x}	40-60"	Dark olive gray (5Y 3/2) loam with many coarse prominent mottles yellowish brown (10YR 5/4) gray (5Y 5/1 & 6/1); strong, very coarse prismatic primary structure with strong, coarse, platy secondary structure; very firm; brittle.

SIZE CLASS AND PARTICLE DIAMETER (mm)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-10	Ap	41.42	46.98	11.60	3.54	6.02	7.61	12.27	11.98	28.89	18.09	
10-15	B21	52.32	38.76	8.92	5.48	8.53	10.42	15.93	11.96	21.36	17.40	
15-23	B22	56.61	34.47	9.02	4.67	9.79	11.33	18.28	12.54	19.85	14.52	
23-40	C1x	48.23	35.60	16.17	4.89	7.57	9.50	14.81	11.46	17.58	18.02	
40-43	C2x	47.31	36.84	15.85	2.78	6.81	10.19	15.87	11.66	18.65	18.19	
Depth (In.)	Horizon	WATER CONTENT								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		Bar Pressures										
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0' pct.	15.0 pct.			
0-10	Ap	36.2	33.5	30.9	30.4	28.9	13.7	12.7	12.6	1.15	0.21	0.415
10-15	B21	35.3	32.2	24.4	21.8	20.2	9.5	8.3	7.0	1.27	0.22	0.606
15-23	B22	21.5	19.3	16.1	15.0	14.0	7.8	7.0	5.3	1.51	0.16	0.156
23-40	C1x	17.4	15.5	13.0	12.0	11.4	9.3	8.4	6.6	1.63	0.10	0.165
40-43	C2x	13.9	13.3	12.6	12.2	12.0	9.6	8.3	6.7	1.81	0.11	0.011
Depth (In.)	Horizon	COARSE FRAGMENTS									TOTAL	
		Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.			
0-10	Ap			0.1	0.7	0.4	0.4	0.8	1.8	4.2		
10-15	B21			1.4	1.2	1.1	1.2	2.0	3.6	10.5		
15-23	B22	2.2		0.5	0.4	0.5	0.7	2.8	6.9	14.0		
23-40	C1x	17.3	0.9		0.3	0.1	0.3	0.8	6.4	26.1		
40-43	C2x				<0.1	<0.1	<0.1	<0.1	0.4	<0.8		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				Acidity	CEC (Sum)	Base Saturation (Sum) pct.
			.01M CaCl ₂ 2:1	H ₂ O 1:1		Ca	Mg	Na	K			
0-10	Ap	2.77	4.85	5.55	5.2	0.3	0.1	0.1	100 g. →	17.4	21.3	
10-15	B21	1.06	5.05	5.7	0.8	0.1	0.2	<0.1	11.8	13.0	9.2	
15-23	B22	0.23	5.25	5.75	1.0	0.2	0.2	0.1	6.2	7.7	22.1	
23-40	C1x	0.08	5.35	5.95	2.5	0.8	0.1	0.2	4.4	8.0	45.0	
40-43	C2x	0.06	5.45	6.05	3.4	1.1	0.1	0.1	4.1	8.8	53.4	

WOODBRIIDGE SOIL SERIES

Site 2

Location: Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
01	2-0"	Grass mulch
A _p	0-8"	Dark brown (10YR 3/3) loam; moderate, medium, granular structure; friable; clear, smooth boundary. (6-10 inches thick)
B ₂₁	8-15"	Olive brown (2.5Y 4/4) fine sandy loam; weak, fine, granular structure; friable; clear, smooth boundary. (5-10 inches thick). B ₂₁ has extension of A _p brown (10YR 4/3). In bottom 2 or 3 inches of B ₂₁ are a few medium distinct mottles, grayish brown (2.5Y 5/2)
B ₂₂	15-23"	Olive (5Y 5/3) fine, sandy loam with many prominent medium and coarse mottles, light olive gray (5Y 6/2) strong brown (7.5YR 5/6). Olive gray (5Y 5/2); weak, thin, platy structure; friable; clear, wavy boundary. (6-10 inches thick). Tops of polygons are in this horizon.
C _{1x}	23-36"	Olive gray (5Y 4/2) crushed color olive (5Y 5/3) loam with many medium and prominent mottles, gray (5Y 5/1 - 6/1) strong brown (7.5YR 5/6); strong, medium, platy structure within the strong, very coarse prismatic structure; very firm; brittle; gradual, smooth boundary. (10-15 inches thick). The prism walls are gray (5Y 6/1) with strong brown (7.5YR 5/6) mottles.
C _{2x}	36-48"+	Olive gray (5Y 4/2) inside color. Ped surfaces are very dark brown (10YR 2/2) with sand coatings which are gray (5Y 5/1); many prominent coarse mottles, gray (5Y 5/1 and 5Y 6/1) and strong brown (7.5YR 5/6), loam; strong, very coarse prismatic structure that breaks to strong, thin, platy; very firm; brittle. Tops of plates in both C _x 's had sand coatings.

SILT CLASS AND PARTICLE DIAMETER

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
0-8	Ap	43.27	44.08	12.65	3.94	5.87	8.10	14.04	11.32	28.84	15.24	
8-15	B21	53.92	35.45	10.63	4.72	7.22	10.82	18.38	12.78	18.96	16.49	
15-23	B22	58.21	32.05	9.74	4.19	9.21	12.37	19.62	12.82	17.16	14.89	
23-36	Clx	48.61	33.69	17.70	3.67	7.38	10.09	15.82	11.65	17.68	16.01	
36-42	C2x	44.42	34.95	20.63	3.38	5.74	8.33	15.27	11.70	18.73	16.22	
WATER CONTENT												
Depth (In.)	Horizon	Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0' pct.	15.0 pct.			
0-8	Ap	38.7	36.7	33.2	32.4	31.9	17.1	14.9	14.8	0.87	0.16	6.384
8-15	B21	37.1	34.4	27.5	25.8	25.1	10.4	10.4	9.6	1.02	0.18	7.066
15-23	B22	22.1	20.4	16.6	15.8	15.4	8.9	7.3	5.8	1.33	0.14	1.911
23-36	Clx	15.2	14.9	14.1	13.9	13.6	9.8	8.6	7.1	1.74	0.12	0.172
36-42	C2x	15.0	14.7	14.0	13.1	13.5	10.5	9.2	7.8	1.72	0.11	0.000
COARSE FRAGMENTS												
Depth (In.)	Horizon	Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL		
0-8	Ap	33.3		0.4	0.4	0.5	0.7	0.9	1.5	37.7		
8-15	B21	45.6			0.1	0.1	0.2	0.7	1.4	48.0		
15-23	B22				0.7	0.8	0.8	1.9	5.1	9.3		
23-36	Clx	1.8	0.5	0.6	0.5	0.4	1.0	1.2	4.1	10.1		
36-42	C2x	3.1	0.4		0.7	<0.1	0.2	0.3	1.9	6.7		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable Bases				Acidity	CEC (Sum)	Base Saturation (Sum) pct.
			.01M CaCl ₂ 2:1	H ₂ O 1:1		Ca	Mg	Na	K			
0-8	Ap	3.79	5.45	6.0	4.2	1.1	0.1	0.4	100.0	20.7	28.0	
8-15	B21	1.82	5.05	5.5	1.4	0.2	0.1	0.1	13.3	15.1	11.9	
15-23	B22	0.50	4.95	5.4	0.9	0.2	0.2	0.1	7.4	8.8	15.9	
23-36	Clx	0.10	5.0	5.6	2.5	0.8	0.1	0.2	4.2	7.8	46.2	
36-42	C2x	0.10	5.2	5.7	3.2	1.0	0.2	0.2	4.3	8.9	51.7	

WOODBRIIDGE SOIL SERIES

Site 3

Location: Monmouth, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-10"	Dark yellowish brown (10YR 4/4) loam; weak, fine, granular structure; friable; abundant roots; clear, smooth boundary. (8-12 inches thick)
B ₂₁	10-20"	Yellowish brown (10YR 5/6) silt loam; weak, fine, granular structure; friable; abundant roots; gradual, smooth boundary. (8-12 inches thick)
B ₂₂	20-24"	Light olive brown (2.5Y 5/4) fine, sandy loam; weak, fine, granular structure; friable; few roots; clear, wavy boundary. (3-5 inches thick)
B ₃	24-29"	Olive gray (5Y 5/2) fine, sandy loam with many medium distinct mottles, light olive gray (5Y 6/2); weak, fine, granular structure; friable; few roots; abrupt, wavy boundary. (3-5 inches thick)
C _{1x}	29-36"	Ped coatings are yellowish brown (10YR 5/6), inside peds olive (5Y 4/3). Outside of peds olive brown (2.5Y 4/4) loam; strong, coarse, platy structure; firm; few roots; abrupt smooth boundary. (6-9 inches thick)
C _{2x}	36-56"	Outside ped colors olive (5Y 5/6), inside peds olive (5Y 4/4) and olive (5Y 4/3) loam; strong, fine, platy structure; very firm; brittle. At 36 inch depth are lenses of

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-10	Ap	43.67	47.76	8.57	3.68	5.38	7.79	13.96	12.86	26.69	21.07	
10-20	B21	40.23	53.52	6.25	3.51	5.48	7.00	12.20	12.04	31.96	21.56	
20-23	B22	53.61	41.78	4.61	5.58	7.66	9.61	17.18	13.58	23.72	18.06	
23-29	B3	53.01	40.66	6.33	4.29	6.64	9.31	17.99	14.78	21.93	18.73	
29-36	Clx	50.89	38.72	10.39	3.47	6.82	8.25	16.13	16.22	21.60	17.12	
36-42	C2x	48.31	37.97	13.72	3.18	5.26	8.34	17.23	14.30	20.58	17.39	
WATER CONTENT												
Bar Pressures												
Depth (In.)	Horizon	60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.	Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
0-10	Ap	44.5	43.5	39.1	38.6	37.0	13.5	12.9	12.9	1.05	0.28	0.034
10-20	B21	31.2	29.5	20.3	18.7	17.5	9.8	8.3	7.1	1.14	0.15	0.902
20-23	B22	27.5	26.3	18.8	15.7	14.4	6.9	5.7	4.2	1.28	0.19	1.123
23-29	B3	23.6	22.7	17.4	15.0	13.0	6.6	5.2	3.6	1.39	0.19	0.250
29-36	Clx	15.8	15.6	14.3	13.6	12.5	9.0	7.3	5.0	1.62	0.15	0.000
36-42	C2x	15.3	15.1	13.8	13.3	12.6	9.0	7.2	5.9	1.75	0.14	0.000
COARSE FRAGMENTS												
Percent by Volume												
Depth (In.)	Horizon	3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.	TOTAL		
0-10	Ap	1.3	1.3	0.4	0.4	0.4	0.4	0.4	0.8	2.0	5.7	
10-20	B21	1.3	1.4	0.5	0.9	1.0	1.0	1.8	3.0	10.9		
20-23	B22	16.1		2.2	0.9	2.0	2.3	4.1	5.9	33.5		
23-29	B3	4.0		1.0	0.7	0.7	0.9	2.0	4.3	13.6		
29-36	Clx		1.4	1.2	0.5	0.2	0.6	1.1	6.5	11.5		
36-42	C2x		1.8	0.9	1.0	0.8	0.4	0.8	3.4	9.1		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Bases		Acidity					
					Ca	Mg	Na	K				
0-10	Ap	2.10	5.0	5.55							24.6	
10-20	B21	0.88	5.25	5.7							23.4	
20-23	B22	0.36	5.35	5.8	3.2	0.7	0.1	0.5	13.8	18.3	11.4	
23-29	B3	0.25	5.25	5.8	0.6	0.2	<0.1	0.4	10.4	9.7	10.3	
29-36	Clx	0.13	5.1	5.6	0.3	0.2	<0.1	0.2	7.0	7.0	17.9	
26-42	C2x	0.10	4.8	5.3	0.7	0.5	0.1	0.1	4.4	6.7	27.0	

WOODBRIIDGE SOIL SERIES

Site 4

Location: Kents Hill, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-7"	Brown (10YR 4/3) silt loam; moderate, medium, granular structure; friable; abundant roots; abrupt, smooth boundary. (6-8 inches thick)
B ₂₁	7-14"	Strong brown (7.5YR 5/6) fine, sandy loam; weak, fine, granular structure; friable; abundant roots; clear, broken boundary. (0-8 inches thick)
B ₂₂	7-17"	Light olive brown (2.5Y 5/4) fine, sandy loam; weak, fine, granular structure; friable; pockets of A _p in worm channels; abundant roots; abrupt, smooth boundary. (9-11 inches thick)
B ₂₃	17-22"	Grayish brown (2.5Y 5/2) fine, sandy loam with common medium prominent mottles; yellowish brown (10YR 5/6) and red (2.5YR 5/8); weak, medium, platy structure; friable; abundant roots. (5-9 inches thick)
C _{1x}	22-33"	Light olive brown (2.5Y 5/4) outside and dark grayish brown (2.5Y 4/2) inside of peds, fine sandy loam with many medium prominent mottles, yellowish brown (10YR 5/8) and strong, thin, platy structure; firm, brittle; sand coatings on peds; tops of polygons are in the bottom of this horizon; clear wavy boundary. (8-12 inches thick)
C _{2x}	33-48"	Olive (5Y 5/3) fine, sandy loam with common fine prominent mottles; yellowish brown (10YR 5/6) and yellowish red (5YR 1/1) (common)

Depth (In.)	Horizon	TOTAL			SAND					SILT		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-6	Ap	38.34	50.56	11.10	2.69	4.89	6.28	12.09	12.39	30.61	19.95	
6-17	B21&B22	51.77	40.63	7.60	4.23	6.60	8.58	17.56	14.80	21.96	18.67	
17-22	B23	61.31	32.68	6.01	4.04	6.68	10.60	23.89	16.10	18.70	13.98	
22-33	Clx	57.96	34.28	7.76	4.91	9.61	10.98	18.23	14.23	19.24	15.04	
33-48	C2x	57.09	34.22	8.69	5.32	10.90	11.50	17.06	12.31	18.85	15.37	
Depth (In.)	Horizon	WATER CONTENT								Bulk Density g./cc.	Avail. Water in./in.	Rate of H2O Movement cm./hr.
		Bar Pressures										
		60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 pct.	15.0 pct.			
0-6	Ap	44.9	44.5	40.3	39.4	38.2	19.8	18.0	18.3	0.99	0.22	0.613
6-17	B21&B22	31.6	29.3	24.5	21.6	20.8	11.4	9.2	7.6	1.16	0.20	0.840
17-22	B23	21.3	20.0	16.7	14.5	13.6	6.7	5.6	4.0	1.52	0.19	0.276
22-33	Clx	16.4	15.1	12.2	9.9	9.5	7.5	6.5	4.8	1.61	0.12	0.293
33-48	C2x	15.8	14.9	11.8	9.4	9.0	7.0	6.1	4.5	1.66	0.12	0.074
Depth (In.)	Horizon	COARSE FRAGMENTS									TOTAL	
		Percent by Volume										
		3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.			
0-6	Ap			0.3	0.8	0.4	0.4	0.6	1.2	3.7		
6-17	B21&B22	2.6		1.1	0.4	0.6	0.6	1.7	3.1	10.1		
17-22	B23	6.3	2.2	2.0	0.2	0.7	1.0	1.9	3.8	18.1		
22-33	Clx	4.3		0.6	1.0	0.9	0.9	1.8	5.1	14.6		
33-48	C2x	5.2	1.6	0.6	0.4	0.4	0.8	1.6	4.5	15.1		
Depth (In.)	Horizon	Organic Carbon pct.	pH		Extractable				CEC (Sum)	Base Saturation (Sum) pct.		
			.01M CaCl ₂ 2:1	H ₂ O 1:1	Bases		Acidity					
					Ca	Mg	Na	K				
0-6	Ap	4.40	5.75	6.5	6.5	4.4	0.1	0.5	100 g. →	47.3		
6-17	B21&B22	1.08	5.4	6.1	6.5	4.4	0.1	0.2	12.8	24.3		
17-22	B23	0.30	5.45	6.0	1.2	0.5	0.1	0.2	10.8	12.8		
22-33	Clx	0.09	5.3	5.7	0.2	0.2	0.1	0.1	5.6	6.2		
33-48	C2x	0.05	5.0	5.5	0.2	0.2	0.2	0.1	4.8	5.5		
					0.3	0.3	0.2	0.1	4.4	5.3		

WOODBRIIDGE SOIL SERIES

Site 5

Location: Winthrop Center, Kennebec County, Maine

<u>Horizon</u>	<u>Depth</u>	<u>Description</u>
A _p	0-10"	Dark yellowish brown (10YR 4/4) loam; weak, fine, granular structure; friable; abundant roots; abrupt, wavy boundary. (8-11 inches thick)
B ₂₂	10-15"	Light olive brown (2.5Y 5/4) fine, sandy loam; weak, fine, granular structure; friable; roots common; many earthworm channels; clear, smooth boundary. (4-6 inches thick)
B ₂₃	15-23"	Olive brown (2.5Y 4/4) fine, sandy loam with few medium distinct mottles, dark yellowish brown (10YR 4/4); moderate, medium, platy structure; friable; few roots; polygons are light brownish gray (2.5Y 6/2); some rotten schistose fragments; many earthworm channels; sand coatings on peds; clear, smooth boundary. (7-9 inches thick)
C _x	23-60"	Dark grayish brown (2.5Y 4/2) loam with few coarse faint mottles, light brownish gray (2.5Y 6/2); light gray (10YR 7/2) prism faces; thin, strong and medium, platy structure; firm and brittle.

Depth (In.)	Horizon	TOTAL			SAND					CLAY		
		Sand (2-.05)	Silt (.05-.002)	Clay (<.002)	Very Coarse (2-1)	Coarse (1-.5)	Medium (.5-.25)	Fine (.25-.1)	Very Fine (1.-.05)	(.05-.02)	(.02-.002)	
Percent of <2mm.												
0-10	Ap	40.53	49.61	9.86	1.73	3.79	7.82	15.09	12.10	26.47	23.14	
10-16	B22	45.87	46.90	7.23	3.08	4.20	8.39	16.29	13.91	28.85	18.05	
16-23	B23	53.38	38.21	8.41	2.80	5.05	9.78	20.45	15.30	24.55	13.66	
23-40	Cx	47.09	35.98	16.93	2.02	5.12	9.34	17.48	13.13	18.09	17.89	
Depth (In.)	Horizon	WATER CONTENT										
		Bar Pressures								Bulk Density g./cc.	Avail. Water in./in.	Rate of H ₂ O Movement cm./hr.
60 cm. pct.	0.1 pct.	0.33 pct.	0.67 pct.	1.0 pct.	3.0 pct.	5.0 ' pct.	15.0 pct.					
0-10	Ap	38.1	35.7	31.7	30.3	29.2	15.9	13.9	12.8	1.03	.19	1.869
10-16	B22	26.4	24.7	19.9	15.5	14.2	8.5	7.4	6.1	1.34	.18	0.660
16-23	B23	15.7	14.7	11.7	9.1	8.6	5.3	4.4	3.2	1.72	.15	0.448
23-40	Cx	15.2	14.5	13.2	11.8	11.5	8.7	7.8	6.0	1.69	.12	0.022
Depth (In.)	Horizon	COARSE FRAGMENTS										
		Percent by Volume									TOTAL	
3+ inches	3-2 inches	2-1.5 inches	1.5-1 inches	1-.75 inches	.75-.50 inches	.50-.25 inches	.25 in.-2 mm.					
0-10	Ap	3.2		0.2	0.5	0.5	0.5	0.7	1.2	6.8		
10-16	B22	1.9	5.0	1.3	2.2	1.1	1.2	1.4	2.1	16.2		
16-23	B23	41.2		2.2	1.0	0.5	0.9	1.2	2.4	49.4		
23-40	Cx	5.8	0.8		0.3	0.1	0.2	0.3	1.8	9.3		
Depth (In.)	Horizon	Organic Carbon pct.	pH			Extractable				CEC (Sum)	Base Saturation (Sum) pct.	
			.01M CaCl ₂ 2:1	H ₂ O 1:1		Bases			Acidity			
						Ca	Mg	Na	K			
← meq./100 g. →												
0-10	Ap	3.15	5.45	6.1	4.9	0.3	0.1	0.2	12.3	17.8	30.9	
10-16	B22	0.82	5.3	5.8	1.1	0.1	0.1	<0.1	7.9	9.3	15.0	
16-23	B23	0.09	5.35	5.8	1.7	0.2	0.1	<0.1	2.9	5.0	42.0	
23-40	Cx	0.06	5.25	5.9	3.3	0.8	0.1	0.2	3.5	7.9	55.7	