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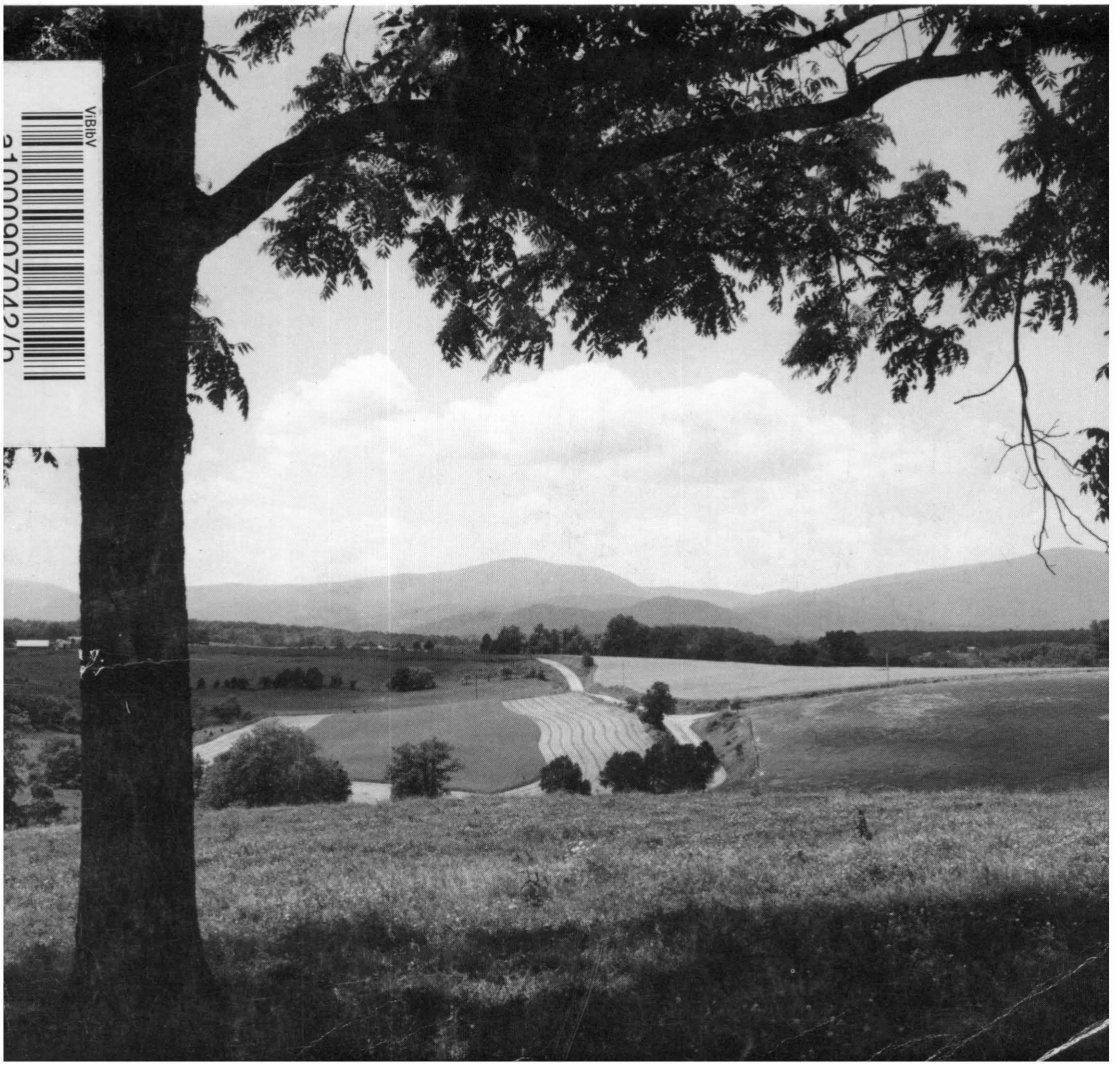
Supplemental Data for Soil Survey of Greene County, Virginia

S. K. Thomas, W. J. Edmonds, and J. C. Baker



James R. Nichols, Dean and Director
College of Agriculture and Life Sciences
Virginia Agricultural Experiment Station
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

The Virginia Agricultural and Mechanical College came into being in 1872 upon acceptance by the Commonwealth of the provisions of the Morrill Act of 1862 "to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." Research and investigations were first authorized at Virginia's land-grant college when the Virginia Agricultural Experiment Station was established by the Virginia General Assembly in 1886.

The Virginia Agricultural Experiment Station received its first allotment upon passage of the Hatch Act by the United States Congress in 1887. Other related Acts followed, and all were consolidated in 1955 under the Amended Hatch Act which states "It shall be the object and duty of the State agricultural experiment stations . . . to conduct original and other researches, investigations and experiments bearing directly on and contributing to the establishment and maintenance of a permanent and effective agricultural industry of the United States, including the researches basic to the problems of agriculture and its broadest aspects and such investigations as have for their purpose the development and improvement of the rural home and rural life and the maximum contributions by agriculture to the welfare of the consumer . . . "

In 1962, Congress passed the McIntire-Stennis Cooperative Forestry Research Act to encourage and assist the states in carrying on a program of forestry research, including reforestation, land management, watershed management, rangeland management, wildlife habitat improvement, outdoor recreation, harvesting and marketing of forest products, and "such other studies as may be necessary to obtain the fullest and most effective use of forest resources."

In 1966, the Virginia General Assembly "established within the Virginia Polytechnic Institute a division to be known as the Research Division . . . which shall encompass the now existing Virginia Agricultural Experiment Station . . . "

SUPPLEMENTAL DATA FOR SOIL SURVEY OF GREENE COUNTY, VIRGINIA

S. K. Thomas, W. J. Edmonds, and J. C. Baker

Agronomy Department
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

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COVER PHOTOGRAPH: Pasture, hay, and small grain on Elioak soils of the Piedmont in the foreground with forests on Myersville and Catoctin soils of the Blue Ridge in the background.

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Introduction

A soil survey of Greene County (Thomas and Crawford, 1986) was completed in 1984 by the Agronomy Department of Virginia Polytechnic Institute and State University, Research Division, in cooperation with the Soil Conservation Service of the United States Department of Agriculture, the Culpeper Soil and Water Conservation District, and the Greene County Board of Supervisors.

This survey was made to determine the kinds of soils within Greene County and how they can be used to their fullest potential. Soil scientists observed the steepness, length, and shape of slopes; the size of streams and general pattern of drainage; the kinds of native plants or crops; and the kinds of rocks. They dug many pits to describe and sample soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the land surface down into the parent material; i.e., weathered rock or unconsolidated sediments which have been changed little by plant roots.

Soil maps are produced when soil scientists draw boundaries on aerial photographs of the kinds of soils observed in the survey area. These photographs show trees, buildings, fields, roads, and other natural and cultural features that were used to locate these soil boundaries.

Mapping units are collections of delineations of natural soil bodies identified by a single symbol on soil maps. Most mapping units represent natural soil bodies composed of one kind of soil or of soils with similar properties and responses to use and management. Other mapping units are made up of two or more kinds of soils.

Since the Soil Survey of Greene County, Virginia, (Thomas and Crawford, 1986) does not include the actual laboratory data used to characterize, classify, and interpret the soils within the mapping units, this supplemental report presents these data.

Materials and Methods

Data for typical and supplemental soil profiles within the map units are presented in the following order:

Morphological descriptions

The morphology of each soil profile was described according to National Cooperative Soil Survey standards specified by the *Soil Survey Manual* (Soil Survey Staff, 1951), *Soil Taxonomy* (Soil Survey Staff, 1975), and the *National Soils Handbook* (USDA, 1983)

Laboratory data

The laboratory data for the profiles described and sampled are presented in the following tables:

A - Chemical properties
B - Chemical properties
C - Chemical properties
D - Particle-size distribution
E - Sand mineralogy
F - Clay mineralogy

Table A - Chemical properties

Table A gives:

1. NH_4OAc, pH 7.0, extractable Ca^{2+} , Mg^{2+}, and K^+ in cmol (+) kg^{-1} of soil.
2. exchange acidity, H^+ in cmol (+) kg^{-1} of soil
3. cation-exchange capacity, CEC, by sum of Ca^{2+}, Mg^{2+} , K^+, and H^+.
4. percent base saturation, BS, was estimated by the sum of exchangeable bases (Ca^{2+}, Mg^{2+}, and K^+) divided by the CEC times 100.

Exchangeable bases (Ca^{2+}, Mg^{2+}, and K^+) were determined by *N* NH_4OAc, pH 7.0, extraction with quantification by atomic absorption spectroscopy (Soil Conservation Service, 1972). Exchange acidity (H^+) was determined by the $BaCl_2$ – TEA , pH 8.2, method (Soil Conservation Service, 1972; Peech, 1965). Percent base saturation was determined by the sum of bases (Ca^{2+}, Mg^{2+}, and K^+) divided by the CEC times 100.

Table B - Chemical properties

Table B gives:

1. Organic matter content in g kg^{-1} of soil
2. pH
3. *N* KCl extractable Al^{3+}
4. Effective cation-exchange capacity, ECEC, by sum of Ca^{2+} , Mg^{2+}, K^+, and Al^{3+}
5. Effective base saturation, EBS, exchangeable bases (Ca^{2+}, Mg^{2+}, and K^+) divided by ECEC times 100.

The organic matter content was determined by the acid-dichromate digestion method of Allison (1965). The pH was determined for 1-to-1 soil-to-water suspension using a combination calomel-glass electrode. Exchangeable Al^{3+} was determined by the method of McLean (1965).

Table C - Chemical properties

Table C gives:

1. Ca^{2+} in ppm
2. Mg^{2+} in ppm
3. P in ppm
4. K^+ in ppm
5. Zinc in ppm
6. Manganese in ppm

These properties were determined by the procedures used by the Soil Testing Laboratory, Agronomy Department, Virginia Tech, Blacksburg, Virginia 24061 (Donohue and McCoy, 1972).

Table D - Particle-size distribution

Table D gives the g kg^{-1} of soil for:

1. very coarse sand (2.0 - 1.0 mm in diameter)
2. coarse sand (1.0 - 0.5 mm in diameter)
3. medium sand (0.5 - 0.25 mm in diameter)
4. fine sand (0.25 - 0.1 mm in diameter)
5. very fine sand (0.1 - 0.05 mm in diameter)
6. total sand
7. silt (0.05 - 0.002 mm in diameter)

8. clay (< 0.002 mm in diameter)

These particle sizes were determined by the hydrometer method of Bouyoucos (1962) or the pipette method of Day (1965).

Table E - Sand mineralogy

Table E gives minerals present in the sand fractions in g kg^{-1} of sand.

Samples for mineralogical analysis were pretreated with H_2O_2 and NaOAc adjusted to pH 5.0 followed by citrate-dithionite-bicarbonate to remove organic matter and oxide coatings.

Each sample was fractionated into sand, silt, and clay. Sand-size fraction was separated by sieving. Clay was separated from silt by centrifugation and decantation using dilute Na_2CO_3 adjusted to pH 9.5, as a dispersant (Tanner and Jackson, 1947; Jackson et al., 1950; Day, 1965; Jackson, 1979).

Sand-size minerals were identified using a Ziess polarizing microscope. Grain mounts were prepared using that portion of the sand fraction that passed a 40-mesh sieve, i.e. the 0.40 mm to 0.05 mm fraction, which constituted the major portion of the total sand fraction and was assumed to be representative. Grain counts were determined by the line-count method of Galehouse (1971) and frequency normalized to grains per one-hundred grains.

Table F - Clay mineralogy

Table F gives minerals present in the clay fractions in g kg^{-1} of clay.

Clay minerals were identified using x-ray diffraction and thermal analysis. Oriented mounts of the clay fractions were prepared according to procedures given by Rich (1969) and Rich and Barnhisel (1977). X-ray diffraction patterns of K-saturated clay mounts dried at room temperature (25° C), 110° C, 300° C, and 550° C and Mg-saturated, glycerol-solvated mounts at 25° C and 110° C were obtained using a Diano XRD-8300-AD x-ray diffractometer equipped with a graphite crystal momochrometer, LSI-11 computer, and printer. Samples were scanned at 2° 2θ $minute^{-1}$ using CuKα radiation. Thermal patterns were obtained using a Dupont 1090 Differential Scanning Calorimeter. Samples were heated in an N_2 atmosphere from 30° C to 625° C at a rate of 20° $minute^{-1}$. Semiquantitative determinations of the amount of gibbsite and kaolinite in clay fractions were made by integrating areas under respective differential scanning calorimeter endothermic peaks at approximately 280° and 520° and comparing with endothermic peaks of Reynolds synthetic gibbsite RH-31F and poorly crystalline Georgia kaolinite obtained from the University of Missouri clay mineral repository. Estimates of other clay minerals were made by proportioning integrated peak areas of appropriate

x-ray diffractograms, using gibbsite and kaolinite as internal standards, and assuming minerals detected were equal to 100 percent.

Table G - Silt mineralogy

Table G in the Appendix gives minerals present in the silt fractions in g kg^{-1} of silt.

Minerals in the silt fraction were identified using x-ray diffraction and thermal analysis. X-ray diffractograms of powder mounts of the silt fractions were obtained using procedures described for the clay fraction. Semiquantitative determinations of the amount of kaolinite in silt fractions were made using procedures described for the clay fraction. Estimates of other silt minerals were made by proportioning integrated peak areas of appropriate x-ray diffractograms, using gibbsite and kaolinite as internal standards, and assuming minerals detected were equal to 100 percent.

Classification of the soils

"When the fixed limits of taxa are superimposed on the fixed pattern of soils in nature, limits of taxonomic classes rarely, if ever, coincide precisely with mappable areas" (United States Department of Agriculture, 1983, p. 602-3). Therefore, only the typical profile is required to be a member of the soil series used to name the mapping unit. Supplemental profiles may members of different taxa at any level in the hierarchical system of *Soil Taxonomy* (Soil Survey Staff, 1975).

This supplemental report is to be used in conjunction with the Soil Survey of Greene County, Virginia (Thomas and Crawford, 1986). Therefore, no interpretations for the mapping unit or the data are presented.

Profile Descriptions and Data

Ashe Series

Soils of the Ashe series are moderately deep and somewhat excessively drained. These soils formed in materials weathered from granitic and gneissic rocks. They are on uplands in the Piedmont physiographic province. Slopes range from 7 to 75 percent.

A typical pedon of Ashe sandy loam, 15 to 25 percent slopes, is located about 1.1 miles north-northeast (20 degrees) of the intersection of Highways US-29 and US-33, 1.6 miles south-southwest (192 degrees) of the intersection of Highways US-29 and VA-645, and 1 mile northeast of Ruckersville.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

A--0 to 5 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many very fine, fine, medium, and coarse roots; many fine discontinuous tubular pores; 12 percent rock fragments; few fine flakes of mica; strongly acid; clear wavy boundary.

E--5 to 10 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; friable; many very fine, fine, medium, and coarse roots; many discontinuous tubular pores; 12 percent rock fragments; few fine flakes of mica; strongly acid; clear wavy boundary.

Bw--10 to 22 inches; strong brown (7.5YR 5/6) sandy loam; weak fine subangular blocky structure; friable; common very fine, fine, and medium roots; common fine discontinuous tubular pores; 12 percent rock fragments; few fine flakes of mica; strongly acid; clear smooth boundary.

C--22 to 30 inches; strong brown (7.5YR 5/6) fine sandy loam; massive; friable; common very fine, fine, and medium roots; many fine vesicular pores; 15 percent rock fragments; few fine flakes of mica; strongly acid; abrupt irregular boundary.

Cr--30 to 38 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), yellowish red (5YR 5/6), black (10YR 2/1), and white (10YR 8/1) slightly weathered granite rock that crushes to coarse sandy loam under moderate pressure; massive; very firm; 15 percent rock fragments; few fine flakes of mica; strongly acid; clear wavy boundary.

R--38 inches; hard fractured granite bedrock.

Table A: Chemical properties for Ashe sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-5	1.36	0.30	0.21	6.60	8.47	22.08
5-10	0.32	0.25	0.12	3.20	3.89	17.74
10-16	0.30	0.47	0.20	4.20	5.17	18.76
16-22	0.13	0.60	0.27	4.00	5.00	20.00
22-30	0.05	0.48	0.36	3.80	4.69	18.98

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Ashe sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-5	24.0	4.58	0.65	2.52	74.21
5-10	6.1	4.78	0.65	1.34	51.49
10-16	2.8	5.09	0.45	1.42	68.31
16-22	1.0	4.73	0.55	1.55	64.52
22-30	1.4	4.80	0.75	1.64	54.27

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Ashe sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-5	180	20	4	34	--	9.7
5-10	72	13	3	31	--	2.8
10-16	84	39	5	47	--	1.4
16-22	48	54	4	63	--	1.6
22-30	60	41	5	75	--	5.6

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Ashe sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-5	54	62	102	236	118	572	275	153
5-10	38	46	98	244	132	558	279	163
10-16	38	54	110	262	122	586	251	163
16-22	12	36	122	346	166	682	185	133
22-30	8	30	116	378	178	710	137	153

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Ashe sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
10-22	200	650	90	10	TR	40	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Ashe Series - Supplemental profile 1

Ashe sandy clay loam, in an area of Ashe sandy loam, 15 to 25 percent slopes, is located about 0.75 miles south of the intersection of Highways VA-633 and VA-617, and 1.1 miles southeast of the intersection of Highways VA-633 and VA-629.

A--0 to 2 inches; dark reddish brown (5YR 3/4) sandy clay loam; moderate fine and medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; neutral; clear smooth boundary.

Bt--2 to 11 inches; red (2.5YR 4/6) clay loam; common fine distinct yellowish red (5YR 5/8), reddish yellow (7.5YR 7/8), and white (N8/) mottles; moderate fine and medium subangular blocky structure; friable; slightly sticky, slightly plastic; common very fine and fine roots; common distinct clay films on faces of peds and in pores; neutral; gradual wavy boundary.

C--11 to 45+ inches; variegated red, yellow, brown, and white fine sandy loam; massive; very friable; few very fine and fine roots; strongly acid.

Table C: Chemical properties* for Ashe sandy clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-2	1679	199	100	105	--	--
2-11	504	199	8	52	--	--
11-45	42	43	7	41	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Ashe sandy clay loam

	Sand							
Depth	VC	C	M	F	VF	Total	Silt	Clay
inches	$g\ kg^{-1}$ of soil							
0-2	40	56	106	172	123	497	243	260
2-11	34	34	71	136	110	385	215	400
11-45	42	55	99	222	235	653	235	112

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Ashe Series - Supplemental profile 2

Ashe sandy clay loam, in an area of Ashe sandy loam, 15 to 25 percent slopes, is located about 0.75 mile northwest of the intersection of Highways VA-743 and US-33 and 0.45 mile south of the intersection of Highways VA-633 and US-33.

Ap--0 to 4 inches; dark reddish brown (5YR 3/3) sandy clay loam; few fine distinct yellowish red (5YR 5/6) mottles; weak medium granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 7 percent rock fragments; moderately acid; clear wavy boundary.

Bt--4 to 8 inches; yellowish red (5YR 4/6) clay; common fine distinct reddish yellow (5YR 6/8) and white (5YR 8/1) mottles; moderate fine subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; few faint clay films on faces of peds and in pores; 15 percent rock fragments; strongly acid; clear broken boundary.

C1--8 to 50 inches; variegated red, yellow, brown, and white sandy clay loam; massive; friable, slightly sticky, slightly plastic; few very fine roots; 5 percent rock fragments; strongly acid, clear irregular boundary.

C2--50 to 60 inches; variegated red, yellow, brown, and white sandy loam; massive; very friable; 1 percent rock fragments; strongly acid.

Table C: Chemical properties* for Ashe sandy clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	1245	199	4	45	--	--
4-8	252	136	4	21	--	--
8-50	52	53	6	30	--	--
50-60	42	18	4	27	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Ashe sandy clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-4	84	56	100	176	130	546	164	290
4-8	50	34	67	124	105	380	146	474
8-50	86	52	74	178	179	569	212	219
50-60	116	72	76	226	167	657	243	100

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Ashe Series - Supplemental profile 3

Ashe gravelly sandy loam, in an area of Ashe sandy loam, 15 to 25 percent slopes, is located about 0.1 mile northwest of the intersection of Highways VA-633 and VA-617 and 0.9 mile west of the intersection of Highways VA-633 and US-33.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 5 inches; dark brown (7.5YR 4/4) gravelly sandy loam; weak fine granular structure; very friable; many very fine, fine, and medium roots; 28 percent rock fragments; common fine flakes of mica; strongly acid; clear smooth boundary.

Bw--5 to 15 inches; strong brown (7.5YR 4/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 5 percent rock fragments; common fine flakes of mica; strongly acid; clear smooth boundary.

BC--15 to 23 inches; strong brown (7.5YR 4/6) sandy clay loam; common fine and medium distinct yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; many fine flakes of mica; strongly acid; abrupt wavy boundary.

C --- 23 to 72 inches; variegated red, yellow, brown and white sandy loam; massive; very friable; few very fine and fine roots; many fine flakes of mica; strongly acid.

Table D: Particle-size distribution* for Ashe sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-5	78	78	100	194	102	552	246	202
5-15	56	64	74	152	112	458	240	302
15-23	48	60	76	186	142	512	276	212
23-72	46	70	118	262	182	678	230	92

*Va Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Belvoir Series

Soils of the Belvoir series are very deep and somewhat poorly drained. These soils formed in colluvial and residual materials weathered from crystalline rocks. They are on footslopes, in heads of drainageways, and along intermittent drainageways in the Piedmont physiographic province. Slopes range from 2 to 7 percent.

A typical pedon of Belvoir sandy loam, 2 to 7 percent slopes, is located about 0.2 mile east (71 degrees) of the intersection of Highways VA-627 and VA-615, 0.5 mile northwest (313 degrees) of the intersection of Highways VA-615 and VA-650, and 1.6 miles north-northwest of Dyke.

Ap--0 to 6 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; friable; common very fine and fine roots; many medium discontinuous tubular pores; 2 percent rock fragments; very slightly acid; clear smooth boundary.

Btl--6 to 12 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine and medium subangular blocky structure; friable slightly sticky, slightly plastic; few very fine and fine roots; common medium discontinuous tubular pores; thin patchy clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2--12 to 28 inches; yellowish brown (10YR 5/8) clay loam; common medium distinct strong brown (7.5YR 5/8) and grayish brown (10YR 5/2) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common medium discontinuous tubular pores; thin patchy clay films on faces of peds; strongly acid; clear wavy boundary.

Bx--28 to 38 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium distinct strong brown (7.5YR 5/8) and light brownish gray (10YR 6/2) mottles; weak thick platy structure parting to weak fine and medium subangular blocky; firm, brittle, slightly sticky, slightly plastic; few medium vesicular pores; thin patchy clay films on faces of peds; strongly acid; clear smooth boundary.

C1--38 to 44 inches; yellowish brown (10YR 5/6) clay; common medium distinct strong brown (7.5YR 5/8) and light brownish gray (10YR 6/2) mottles; massive; firm, slightly sticky, slightly plastic; few medium vesicular pores; few fine flakes of mica; strongly acid; abrupt smooth boundary.

C2--44 to 63 inches; mottled brownish yellow (10YR 6/6), gray (10YR 6/1), and strong brown (7.5YR 5/8) clay; massive; firm, sticky, plastic; few fine vesicular pores; very strongly acid.

Table A: Chemical properties for Belvoir sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-6	3.81	1.30	0.24	3.99	9.34	57.28
6-12	2.17	1.15	0.39	3.57	7.28	50.96
12-28	2.10	1.65	0.31	8.19	12.25	33.14
28-38	0.82	1.74	0.16	9.24	11.96	22.74
38-44	0.90	2.40	0.25	12.18	15.73	22.57
44-63	0.86	2.20	0.24	11.97	15.27	21.61

*CEC = $Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**BS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Belvoir sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-6	--	6.30	0.05	5.40	99.07
6-12	--	6.50	0.05	3.76	98.67
12-28	--	6.15	1.45	5.51	73.68
28-38	--	6.00	2.65	5.37	50.65
38-44	--	5.75	4.15	7.70	46.10
44-63	--	5.65	4.65	7.95	41.51

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Belvoir sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	792	120	5	48	--	7.7
6-12	372	117	4	88	--	1.6
12-28	300	120	3	64	--	0.7
28-38	144	120	3	33	--	1.6
38-44	132	120	3	39	--	0.5
44-63	156	120	3	47	--	0.4

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Belvoir sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	66	131	167	169	86	619	282	99
6-12	56	121	147	139	74	537	324	139
12-28	61	113	117	124	64	479	291	230
28-38	72	117	145	140	62	536	255	209
38-44	32	78	94	74	43	321	353	326
44-63	21	81	78	93	49	322	374	304

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Belvoir sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
12-28	470	500	TR	10	TR	TR	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Braddock Series

Soils of the Braddock series are very deep and well drained. These soils formed in alluvial and colluvial materials weathered from crystalline rocks. They are on dissected alluvial fans and terraces in the Blue Ridge and Piedmont physiographic provinces. Slopes range from 2 to 25 percent.

A typical pedon of Braddock loam, 2 to 7 percent slopes, is located about 1 mile northeast (47 degrees) of the intersection of Highways VA-810 and VA-634, 1 mile northwest (316 degrees) of the intersection of Highways US-33 and VA-646, and 2 miles northwest of Stanardsville.

Ap--0 to 6 inches; brown (7.5YR 4/4) loam; many medium distinct reddish brown (5YR 4/4) mottles; moderate medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; common fine and medium discontinuous tubular pores; 7 percent rock fragments; slightly acid; clear wavy boundary.

Bt1--6 to 17 inches; yellowish red (5YR 4/6) clay loam; common medium distinct reddish brown (2.5YR 4/4) mottles; moderate medium subangular blocky structure; friable, very sticky, very plastic; common very fine and fine roots; common fine and medium discontinuous tubular pores; thin patchy clay films on faces of peds; 5 percent rock fragments; strongly acid; gradual wavy boundary.

Bt2--17 to 38 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, very sticky, very plastic; common very fine roots, common fine and medium discontinuous tubular pores; thin patchy clay films on faces of peds; 5 percent rock fragments; strongly acid; diffuse smooth boundary.

Bt3--38 to 72 inches; red (2.5YR 4/6) clay; few medium distinct strong brown (7.5YR 4/6 and 5/6) mottles; moderate fine and medium subangular blocky structure; firm, very sticky, very plastic; few very fine roots; common fine and medium discontinuous tubular pores; thin patchy clay films on faces of peds; 5 percent rock fragments; strongly acid.

Table A: Chemical properties for Braddock loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-6	4.69	1.01	0.22	5.40	11.32	52.30
6-17	3.03	1.12	0.29	4.60	9.04	49.12
17-38	2.62	2.30	0.24	9.40	14.56	35.44
38-72	0.15	1.05	0.30	11.40	12.90	11.63

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Braddock loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-6	19.0	4.98	0.35	6.27	94.42
6-17	6.1	6.02	0.15	4.59	96.73
17-38	1.8	5.40	0.45	5.61	91.98
38-72	2.4	4.88	3.25	4.75	31.58

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Braddock loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	840	120	67	43	--	--
6-17	537	144	9	71	--	--
17-38	302	199	6	30	--	--
38-72	84	112	9	47	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Braddock loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	20	60	70	88	60	298	328	374
6-17	16	50	70	84	46	266	300	434
17-38	18	38	56	70	36	218	162	620
38-72	18	40	56	65	30	209	171	620
17-23	14	38	54	70	34	210	224	566
23-29	20	40	56	66	30	212	208	580
29-35	20	40	54	66	34	214	196	590
35-41	18	40	52	58	28	196	210	594
41-47	20	36	48	58	30	192	184	624
47-53	16	36	50	63	30	195	201	604
53-59	20	40	54	64	34	212	188	600
59-65	16	38	54	62	34	204	176	620
65-71	24	44	56	68	34	226	170	604
74+	20	42	56	62	32	212	172	616

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Braddock loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
6-38	610	240	10	--	140	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Table F: Clay mineralogy* for Braddock loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
6-38	350	--	--	430	50	150	20	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Braddock Series - Supplemental profile 1

Braddock sandy clay loam, in an area of Braddock loam, 2 to 7 percent slopes, is located about 0.25 miles northwest of the intersection of Highways US-33 and VA-743 and 0.85 miles southeast of the intersection of Highways US-33 and VA-633.

Ap -- 0 to 8 inches; yellowish red (5YR 4/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine roots; neutral; abrupt smooth boundary.

Bt1 -- 8 to 28 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; common distinct clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt2 -- 28 to 56 inches; red (2.5YR 4/6) clay; few fine prominent very pale brown (10YR 7/3) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine roots; common distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt3 -- 56 to 72 inches; red (2.5YR 4/6) clay; few fine prominent yellowish red (5YR 5/6) and very pale brown (10YR 7/3) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; common distinct clay films on faces of peds; very strongly acid.

Table C: Chemical properties* for Braddock sandy clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-8	840	143	37	75	--	--
8-28	602	181	8	3	--	--
28-56	0	52	3	15	--	--
56-72	28	13	8	9	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Braddock sandy clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-8	12	21	124	242	107	506	221	273
8-28	6	10	50	118	57	241	115	644
28-56	6	16	66	157	85	330	96	574
56-72	9	15	78	205	102	409	95	496

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Braddock Series - Supplemental profile 2

Braddock loam; 2 to 7 percent slopes, is located about 1.1 miles west of the intersection of Highways VA-604 and VA-674 and 1.25 miles northwest of the intersection of Highways VA-604 and VA-633.

Ap1 -- 0 to 3 inches; dark brown (10YR 4/3) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; 2 percent rock fragments; slightly acid; clear smooth boundary.

Ap2 -- 3 to 8 inches; yellowish brown (10YR 5/4) loam; common medium distinct dark brown (10YR 4/3) and strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine roots; 2 percent rock fragments; slightly acid; clear smooth boundary.

Bt1 -- 8 to 28 inches; red (2.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/4) and yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; common very fine and fine roots; common faint clay films on faces of peds; 1 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2 -- 28 to 47 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/6), yellowish brown (10YR 5/4), and yellowish red (5YR 4/6) mottles; weak medium platy structure parting to moderate fine angular blocky; firm, sticky, plastic; common distinct clay films on faces of peds; 1 percent rock fragments; very strongly acid; gradual smooth boundary.

2Bt3 -- 47 to 63 inches; red (2.5YR 4/6) clay; common medium distinct reddish brown (5YR 4/4), strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) mottles; moderate fine angular blocky structure; firm, sticky, plastic; common distinct clay films on faces of peds; 1 percent rock fragments; very strongly acid; gradual wavy boundary.

2BCt -- 63 to 75 inches; red (2.5YR 4/6) silty clay; many medium distinct strong brown (7.5YR 5/6), dark yellowish brown (10YR 4/4), and white (10YR 8/2) mottles of saprolite; weak medium and coarse subangular blocky structure; firm, sticky, plastic; common faint clay films on faces of peds; 1 percent rock fragments; very strongly acid; gradual wavy boundary.

2Ct -- 75 to 105 inches; variegated red, yellow, brown, black and white silty clay loam; massive; friable, slightly sticky, slightly plastic; few clay flows; 1 percent rock fragments; very strongly acid.

Table C: Chemical properties* for Braddock loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-3	1243	199	21	188	1.8	--
3-8	806	128	22	177	0.8	--
8-28	219	153	125	104	0.5	--
28-47	101	92	31	66	0.6	--
47-63	67	44	14	24	0.7	--
63-75	51	32	20	26	0.7	--
75-105	51	36	23	30	0.7	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Braddock loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	20	80	102	107	66	375	464	161
3-8	26	69	87	100	60	342	428	230
8-28	17	38	48	57	32	192	287	521
28-47	2	11	16	29	12	70	210	720
47-63	1	8	18	41	12	80	310	610
63-75	1	7	17	46	22	93	427	480
75-105	12	32	33	36	22	135	585	280

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Buckhall Series

Soils of the Buckhall series are very deep and well drained. These soils formed in materials weathered from granitic and gneissic rocks. They are on uplands in the Piedmont physiographic province. Slopes range from 7 to 25 percent.

A typical pedon of Buckhall loam, 7 to 15 percent slopes, is located about 0.2 mile northeast (50 degrees) of the intersection of Highways VA-810 and VA-631, 1 mile north (18 degrees) of the intersection of Highways VA-810 and VA-633, and 2.6 miles northeast of Dyke.

Ap--0 to 9 inches; yellowish brown (10YR 5/6) loam; moderate fine and medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; common fine discontinuous tubular pores; 5 percent rock fragments; few fine flakes of mica; strongly acid; abrupt smooth boundary.

Bt--9 to 27 inches; yellowish red (5YR 5/8) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; common very fine and fine roots; many fine and discontinuous tubular pores; thick continuous clay films on faces of peds; few fine flakes of mica; strongly acid; clear smooth boundary.

BCt--27 to 36 inches; yellowish red (5YR 5/8) loam; many medium distinct reddish yellow (7.5YR 6/8) and white (10YR 8/1) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; many fine discontinuous tubular pores; thin discontinuous clay film on faces of peds; common fine flakes of mica; very strongly acid; clear wavy boundary.

C--36 to 62 inches; mottled reddish yellow (7.5YR 6/8), white (10YR 8/1), and yellowish red (5YR 5/8) loam; massive; friable; common fine vesicular pores; common fine flakes of mica; very strongly acid.

Table A: Chemical properties for Buckhall loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-9	2.08	0.85	0.70	11.80	15.43	23.53
9-27	1.30	0.93	0.60	13.00	15.83	17.88
27-36	0.37	0.45	0.50	12.60	13.92	9.48
36-62	0.10	0.25	0.16	10.20	10.71	4.76

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Buckhall loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-9	1.7	4.55	1.65	5.28	68.75
9-27	0.7	4.29	4.45	7.28	38.87
27-36	0.6	3.81	6.45	7.77	16.99
36-62	0.5	4.07	6.35	6.86	7.43

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Buckhall loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-9	312	75	3	155	--	1.3
9-27	180	65	3	124	--	0.1
27-36	36	29	2	47	--	0.1
36-62	36	21	3	26	--	0.1

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Buckhall loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-9	56	75	71	83	61	346	385	269
9-27	27	46	49	47	37	206	366	428
27-36	37	76	74	57	49	293	503	204
36-62	53	122	96	61	51	383	512	105

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Buckhall loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
9-27	--	TR	200	550	TR	--	--	250#

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.
#Interstratified vermiculite/mica.

Cataska Series

Soils of the Cataska series are moderately deep and excessively drained. These soils formed in materials weathered from siltstone, shale, and phyllite. They are on uplands in the Blue Ridge physiographic province. Slopes range from 25 to 75 percent.

A typical pedon of Cataska channery silt loam, in an area of Cataska very stony silt loam, 25 to 75 percent slopes, is located about 0.1 mile northeast (38 degrees) from Ivy Creek Overlook and 0.5 mile south (180 degrees) from Brown Mountain Overlook on the Skyline Drive.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

A--0 to 2 inches; very dark grayish brown (10YR 3/2) channery silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; common fine discontinuous tubular pores; 25 percent rock fragments; very strongly acid; abrupt smooth boundary.

E--2 to 7 inches; yellowish brown (10YR 5/4) channery loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; common fine discontinuous tubular pores; 30 percent rock fragments; very strongly acid; clear smooth boundary.

Bw--7 to 17 inches; yellowish brown (10YR 5/6) very channery silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; common fine discontinuous tubular pores; 45 percent rock fragments; very strongly acid; clear smooth boundary.

Cr--17 to 36 inches; yellowish brown (10YR 5/4) slightly weathered siltstone that crushes to extremely channery loam under moderate pressure; massive; friable, slightly sticky, slightly plastic; 80 percent rock fragments; very strongly acid; abrupt smooth boundary.

R--36 inches; fractured hard siltstone bedrock.

Table A: Chemical properties for Cataska channery silt loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inchess	cmol (+) kg^{-1} soil					%
0-2	0.34	0.25	0.39	31.40	32.38	3.03
2-7	0.07	0.11	0.18	14.80	15.16	2.37
7-17	0.19	0.26	0.18	15.60	16.23	3.88
17-36	0.23	0.33	0.14	10.20	10.90	6.42

$$*CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$$

$$**BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$$

Table B: Chemical properties for Cataska channery silt loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inchess	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-2	84.6	3.75	7.25	8.23	11.91
2-7	23.7	4.19	4.55	4.91	7.33
7-17	12.9	4.35	6.25	6.88	9.16
17-36	6.4	4.34	3.65	4.35	16.09

$$*ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$$

$$**EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$$

Table C: Chemical properties* for Cataska channery silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inchess	ppm					
0-2	120	15	15	33	--	8.4
2-7	36	7	21	18	--	2.2
7-17	72	25	57	28	--	2.0
17-36	60	24	55	26	--	1.4

*Soil Testing Laboratory, *Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Cataska channery silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inchess	g kg^{-1} of soil							
0-2	21	21	42	135	171	390	532	78
2-7	27	29	39	143	196	434	368	198
7-17	72	74	89	134	116	485	241	274
17-36	89	119	133	188	126	655	177	168

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for channery silt loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inchess	g kg^{-1} of sand						
7-17	210	60	##	TR	TR	720	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.
##X-ray analysis indicates about 20 to 30 percent mica, probably a component of the rock fragments.

Cataska Series - Supplemental profile 1

Cataska very channery loam, in an area of Cataska very stony silt loam, 25 to 75 percent slopes, is located about 0.4 mile west of Pinefield Gap and 0.45 mile east of Brown Mountain Overlook on the Skyline Drive.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

A--0 to 4 inches; very dark grayish brown (10YR 3/2) very channery loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; 40 percent rock fragments; extremely acid; clear smooth boundary.

Bw1--4 to 16 inches; yellowish brown (10YR 5/6) very channery clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; few faint clay films on faces of peds; 40 percent rock fragments; very strongly acid; clear smooth boundary.

Bw2--16 to 26 inches; yellowish brown (10YR 5/6) very channery sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; few faint clay films on faces of peds; 42 percent rock fragments; very strongly acid; clear smooth boundary.

Cr--26 to 33 inches; yellowish brown (10YR 5/4) slightly weathered bedrock that crushes under moderate pressure to extremely channery sandy loam; massive; friable; few very fine and fine roots; 70 percent rock fragments; very strongly acid; abrupt smooth boundary.

R--33 inches; fractured hard siltstone bedrock.

Table C: Chemical properties* for Cataska channery loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	60	8	23	39	--	4.2
4-16	36	5	6	28	--	1.1
16-26	36	6	5	23	--	0.9
26-33	60	13	49	28	--	3.3

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Cataska channery loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	44	40	44	106	120	354	456	190
4-16	36	28	26	104	134	328	382	290
16-26	98	66	62	156	154	536	254	210
26-33	134	68	64	148	138	552	258	190

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Catoctin Series

Soils of the Catoctin series are moderately deep and well drained. These soils formed in materials weathered from metabasalts and associated metavolcanic and metasedimentary rocks. They are on uplands in the Blue Ridge physiographic province. Slopes range from 7 to 80 percent.

A typical pedon of Catoctin channery silt loam, in an area of Myersville and Catoctin very stony silt loams, 7 to 15 percent slopes, is located about 0.9 mile northeast (45 degrees) of the intersection of Highways VA-632 and VA-637 at Mountain Grove Chapel in Bacon Hollow and 2 miles south-southeast (155 degrees) of the intersection of the Skyline Drive with the Greene and Rockingham County lines.

A--0 to 5 inches; dark brown (10YR 3/3) channery silt loam; moderate fine granular structure; very friable, slightly sticky, slightly plastic; many very fine and fine roots; common fine discontinuous tubular pores; 30 percent rock fragments; moderately acid; clear wavy boundary.

Bw--5 to 18 inches; yellowish brown (10YR 5/6) channery silt loam; weak very fine subangular blocky structure, interrupted by thin lenses and irregularly shaped areas of reddish brown (5YR 4/4) channery silty clay loam with moderate very fine and fine subangular blocky structure; thin patchy clay films on faces of peds; friable, slightly sticky, slightly plastic; common very fine and fine roots; common fine discontinuous tubular pores; 30 percent rock fragments; moderately acid; abrupt wavy boundary.

C--18 to 26 inches; yellowish brown (10YR 5/6) extremely channery silt loam; massive; friable, slightly sticky, slightly plastic; few very fine roots; common fine vesicular pores; 70 percent rock fragments; slightly acid; clear wavy boundary.

R--26 inches; hard greenstone bedrock.

Table A: Chemical properties for Catoctin channery silt loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-5	5.70	2.10	3.50	16.60	27.90	40.50
5-18	6.20	1.60	1.20	11.00	20.00	45.00
18-26	12.10	3.80	0.19	8.60	24.69	65.17

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Catoctin channery silt loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-5	65.0	4.88	0.15	11.45	98.69
5-18	10.7	5.30	0.35	9.35	96.26
18-26	4.40	5.82	0.15	16.24	99.08

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Catoctin channery silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-5	1192	199	33	188	--	--
5-18	621	132	11	188	--	--
18-26	1209	199	12	43	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Catoctin channery silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-5	115	67	37	33	9	261	490	249
5-18	66	57	31	31	28	213	518	269
18-26	76	50	30	35	25	216	548	236

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Catoctin channery silt loam

Depth	Quartz	Feldspar	Mica##	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
5-26	120	--	760	--	120	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.
##Mainly chlorite.

Photograph 1: Catoctin-Rock outcrop complex, 25 to 80 percent slopes.

Catoctin Series - Supplemental profile 1

Catoctin channery silt loam, in an area of Myersville and Catoctin very stony silt loams, 7 to 15 percent slopes, is located about 1.5 miles east-southeast of Bacon Hollow overlook on the Skyline Drive and 0.5 mile southeast of the National Park Service gate on Highway VA-626.

Ap--0 to 6 inches; dark brown (10YR 3/3) very channery silt loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; 42 percent rock fragments; very strongly acid; clear smooth boundary.

Bw--6 to 12 inches; brown (10YR 4/3) very channery clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; 38 percent rock fragments; very strongly acid; clear irregular boundary.

C--12 to 22 inches; brown (10YR 4/3) very channery silt loam; massive; friable, slightly sticky, slightly plastic; few very fine, fine, and medium roots; 50 percent rock fragments; strongly acid; clear wavy boundary.

R--22+ inches; greenstone bedrock.

Table C: Chemical properties* for Catoctin channery silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	386	96	11	93	--	--
6-12	135	50	10	47	--	--
12-22	302	187	6	23	--	--

*Soil Testing Laboratory, *Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Catoctin channery silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-6	80	78	50	42	24	274	516	210
6-12	52	56	38	36	38	220	500	280
12-22	40	46	40	44	32	202	558	240

**Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Photograph 2: Myersville and Catoctin extremely stony silt loams, 15 to 25 percent slopes.

Chatuge Series

Soils of the Chatuge series are very deep and poorly drained. These soils formed in colluvial materials weathered from crystalline rocks. They are along intermittent drainageways and on footslopes in the Piedmont physiographic province. Slopes range from 1 to 4 percent.

A typical pedon of Chatuge sandy loam, 1 to 4 percent slopes, is located about 0.9 mile south-southeast (158 degrees) of the intersection of Highways VA-606 and VA-607, 0.5 mile northeast (34 degrees) of the intersection of Highways VA-607 and VA-670, and 2.5 miles south of Ruckersville.

Ap--0 to 6 inches; dark grayish brown (10YR 4/2) sandy loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak fine granular structure; friable; many very fine, fine, and medium roots; common fine discontinuous tubular pores; 4 percent rock fragments; few fine flakes of mica; very strongly acid; abrupt smooth boundary.

Bg--6 to 9 inches; light brownish gray (10YR 6/2) sandy loam; few fine distinct strong brown (7.5YR 5/8) and yellow (10YR 7/8) mottles; weak thick platy structure parting to weak medium subangular blocky; friable; common very fine and fine roots; common fine discontinuous tubular pores and vesicular pores; thin very patchy clay films on faces of peds; 4 percent rock fragments; very few fine flakes of mica; strongly acid; clear wavy boundary.

Btg1--9 to 15 inches; gray (10YR 6/1) sandy loam; many fine and medium distinct brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common very fine and fine roots; common fine discontinuous tubular pores; thin patchy clay films on faces of peds; 4 percent rock fragments; few fine flakes of mica; very strongly acid; clear smooth boundary.

Btg2--15 to 36 inches; gray (10YR 6/1) sandy clay loam; common and medium distinct strong brown (7.5YR 5/8) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; common fine discontinuous tubular pores; thin patchy clay films on faces of peds; 5 percent rock fragments; strongly acid; clear wavy boundary.

Btg3--36 to 41 inches; gray (10YR 6/1) sandy clay loam; few fine distinct brownish yellow (10YR 6/8) mottles; weak thick platy structure parting to weak medium subangular blocky; friable, slightly sticky, slightly plastic; few very fine roots; few fine vesicular pores; thin patchy clay films on faces of peds; 4 percent rock fragments; common fine flakes of mica; very strongly acid; abrupt wavy boundary.

Cg1--41 to 56 inches; gray (N 6/) sandy loam; massive; friable; few very fine and fine roots; common fine vesicular pores; 10 percent rock fragments; common fine flakes of mica; strongly acid; abrupt wavy boundary.

2Cg2--56 to 65 inches; mottled brown, white, and yellow highly weathered bedrock that crushes to loam; massive; friable, slightly sticky, slightly plastic; common fine vesicular pores; 10 percent rock fragments; many fine flakes of mica; very strongly acid.

Table A: Chemical properties for Chatuge sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-6	0.26	0.16	0.07	5.60	6.09	8.05
6-9	0.13	0.15	0.33	3.80	4.41	13.83
9-15	0.23	0.29	0.01	3.40	3.93	13.49
15-36	0.29	0.68	0.03	5.20	6.20	16.13
36-41	0.24	0.79	0.07	5.80	6.90	15.94
41-56	0.28	0.76	0.14	4.20	5.38	21.93
56-65	0.75	1.15	0.33	8.80	11.03	20.22

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Chatuge sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-6	16.3	4.22	1.45	1.94	25.26
6-9	2.80	3.91	1.25	1.86	32.80
9-15	1.00	4.34	1.55	2.08	25.48
15-36	0.30	4.40	2.15	3.15	31.75
36-41	0.30	4.56	2.25	3.35	32.84
41-56	0.00	3.99	1.15	2.33	50.64
56-65	1.70	3.90	4.45	6.68	33.38

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Chatuge sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	132	15	5	26	--	3.4
6-9	132	19	6	17	--	2.6
9-15	96	21	6	9	--	1.3
15-36	72	60	5	11	--	0.8
36-41	72	63	4	17	--	1.8
41-56	84	60	5	28	--	4.3
56-65	108	69	10	70	--	13.2

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Chatuge sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	34	49	110	245	208	646	247	107
6-9	43	72	134	240	161	650	233	117
9-15	50	61	109	257	162	639	218	143
15-36	66	57	103	213	152	591	177	232
36-41	49	56	136	305	145	691	79	230
41-56	177	135	138	229	115	794	85	121
56-65	7	9	23	217	317	573	333	94

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Chatuge sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
6-36	410	540	30	TR	TR	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Table F: Clay mineralogy* for Chatuge sandy loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
9-36	150	50	90	660	TR	--	TR	50

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous, mostly chlorite.

Chatuge Series - Supplemental profile 1

Chatuge loam, in an area of Chatuge sandy loam, 2 to 7 percent slopes, is located about 0.5 mile south of the intersection of Highways VA-637 and VA-621 and 1.1 miles northwest of the intersection of Highways VA-621 and US-33.

Ap--0 to 9 inches; brown (10YR 5/3) loam; common fine distinct yellowish brown (10YR 5/6) and few fine faint grayish brown mottles; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; few fine flakes of mica; moderately acid; clear wavy boundary.

Btg1--9 to 16 inches; light brownish gray (2.5Y 6/2) loam; yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; common faint clay films on faces of peds; few fine flakes of mica; strongly acid; clear smooth boundary.

Btg2--16 to 36 inches; gray (10YR 5/1) sandy clay loam; common fine distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; common distinct clay films on faces of peds; few fine flakes of mica; moderately acid; clear smooth boundary.

Btg3--36 to 55 inches; gray (10YR 5/1) clay loam; common medium and coarse distinct light brownish gray (2.5Y 6/2) mottles; weak medium angular blocky structure; friable, slightly sticky, slighlty plastic; few very fine roots; common distinct clay films on faces of peds; few fine flakes of mica; slightly acid; abrupt wavy boundary.

2C--55 to 62 inches; mottled yellow, brown, and gray weathered bedrock that crushes under slight pressure to silt loam and sandy loam; friable; few very fine roots; common fine flakes of mica; neutral.

Table A: Chemical properties for Chatuge loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-9	1.40	0.52	0.07	7.20	9.19	21.65
9-16	1.32	0.67	0.02	3.20	5.21	38.58
16-25	2.55	2.10	0.03	2.80	7.48	62.57
25-36	4.38	3.70	0.07	3.20	11.35	71.81
36-55	7.30	7.40	0.13	1.60	16.43	90.26
55-62	14.70	9.80	0.18	4.20	28.88	85.46

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Chatuge loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-9	--	5.00	0.75	2.74	72.63
9-16	--	5.40	0.25	2.26	88.94
16-25	--	5.98	0.05	4.73	98.94
25-36	--	6.45	0.10	8.25	98.79
36-55	--	6.53	0.05	14.88	99.66
55-62	--	7.07	0.15	24.83	99.40

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Chatuge loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-9	252	42	2	15	--	5.0
9-16	240	67	2	6	--	1.8
16-25	408	120	2	9	--	0.6
25-36	528	120	1	11	--	1.2
36-55	684	120	2	17	--	3.8
55-62	1200	120	3	29	--	5.0

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Chatuge loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-9	24	82	118	128	52	404	385	211
9-16	28	90	128	140	66	452	307	241
16-36	24	104	166	176	68	538	191	271
36-55	10	54	94	108	52	318	311	371
55-62	8	32	46	88	84	258	531	211

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Chatuge loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
9-16	100	50	150	540	100	60	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Chester Series

Soils of the Chester series are very deep and well drained. These soils formed in materials weathered from granodiorite, granite gneiss, and biotite gneiss. They are on uplands in the Piedmont and Blue Ridge physiographic provinces. Slopes range from 7 to 25 percent.

A typical pedon of Chester loam, 7 to 15 percent slopes, is located about 1.3 miles west (269 degrees) of the intersection of Highways US-33 and VA-638, 0.9 mile north-northwest (340 degrees) of the intersection of Highways VA-634 and VA-635, and 1 mile west of Lydia.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 7 inches; dark brown (10YR 4/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; common fine discontinuous tubular pores; 10 percent rock fragments; strongly acid; abrupt wavy boundary.

Bt1--7 to 12 inches; strong brown (7.5YR 4/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine discontinuous tubular pores; thin patchy clay films on faces of peds; 10 percent rock fragments; strongly acid; clear smooth boundary.

Bt2--12 to 17 inches; strong brown (7.5YR 5/8) clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine, fine, and medium roots; common fine discontinuous tubular pores; thin patchy clay films on faces of peds; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt3--17 to 39 inches; yellowish red (5YR 5/8) clay loam; few medium distinct yellowish brown (10YR 5/6) mottles in the lower part; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; common fine discontinuous tubular pores; thin continuous clay films on faces of peds; 5 percent rock fragments; strongly acid; clear smooth boundary.

BCt--39 to 46 inches; yellowish red (5YR 5/8) clay loam; many medium distinct reddish yellow (7.5YR 6/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; common fine discontinuous tubular pores; thin very patchy clay films on faces of peds; 5 percent rock fragments; strongly acid; clear smooth boundary.

C--46 to 62 inches; mottled strong brown (7.5YR 5/8) and yellowish red (5YR 5/8) loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; common fine discontinuous vesicular pores; 2 percent rock fragments; strongly acid.

Table A: Chemical properties for Chester loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-7	2.03	0.47	0.37	25.00	27.87	10.30
7-12	1.11	0.34	0.09	19.40	20.94	7.35
12-17	1.55	0.47	0.10	15.60	17.72	11.96
17-39	1.08	0.43	0.08	16.00	17.59	9.04
39-46	0.27	0.29	0.06	16.40	17.02	3.64
46-62	0.13	0.16	0.04	14.20	14.53	2.27

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Chester loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-7	4.8	5.02	1.15	4.02	71.39
7-12	1.9	5.12	1.55	3.09	49.84
12-17	0.9	5.35	1.45	3.57	59.38
17-39	0.7	5.42	1.75	3.34	47.60
39-46	0.7	5.25	2.55	3.17	19.56
46-62	0.6	5.26	2.15	2.48	13.31

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Chester loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-7	312	33	3	40	--	4.9
7-12	168	25	1	17	--	2.2
12-17	216	37	1	14	--	1.2
17-39	156	31	1	11	--	0.4
39-46	60	23	2	8	--	0.1
46-62	36	13	3	8	--	0.1

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Chester loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-7	41	78	101	91	49	360	325	315
7-12	56	77	80	89	52	354	321	325
12-17	44	77	81	80	49	331	335	334
17-39	38	63	60	64	40	265	381	354
39-46	42	73	74	74	58	321	328	351
46-62	27	72	79	72	57	307	407	286

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Chester loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
12-39	550	70	TR	70	10	70	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Table F: Clay mineralogy* for Chester loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC
inches	g kg^{-1} of clay							
12-39	150	--	--	770	30	--	30	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Codorus Series

Soils of the Codorus series are very deep and moderately well and somewhat poorly drained. These soils formed in alluvial materials weathered from crystalline rocks. They are on floodplains in the Piedmont physiographic province. Slopes range from 0 to 4 percent.

A typical pedon of Codorus loam, in an area of Suches-Codorus complex, is located about 1 mile southeast (120 degrees) of the intersection of Highways VA-622 and VA-624, 1.2 miles northeast (26 degrees) of the intersection of Highways VA-624 and VA-623 near Greene Mountain Lake, and 2 miles south of Stanardsville.

Ap--0 to 11 inches brown (10YR 4/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; few fine discontinuous tubular pores; common fine flakes of mica; moderately acid; abrupt smooth boundary.

Bw1--11 to 18 inches yellowish brown (10YR 5/4) loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; common fine discontinuous tubular pores; common fine flakes of mica; strongly acid; clear smooth boundary.

Bw2--18 to 31 inches yellowish brown (10YR 5/4) loam; many fine, medium, and coarse distinct strong brown (7.5YR 5/6) and light gray (10YR 7/2) mottles; weak very coarse platy structure parting to weak medium subangular blocky; friable, slightly sticky, slightly plastic; few very fine roots; common fine discontinuous tubular pores and vesicular pores; common fine flakes of mica; moderately acid; clear wavy boundary.

Bw3--31 to 39 inches; strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak very coarse platy structure parting to weak medium subangular blocky; friable, slightly sticky, slightly plastic; common fine discontinuous tubular pores and vesicular pores; many fine flakes of mica; moderately acid; clear smooth boundary.

Bw4--39 to 45 inches strong brown (7.5YR 5/6) loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) mottles; weak very thick platy structure; friable, slightly sticky, slightly plastic; few fine discontinuous tubular pores and vesicular pores; common fine flakes of mica; strongly acid; abrupt wavy boundary.

C--45 to 60 inches yellowish brown (10YR 5/4) loamy sand; single grain; loose; common fine vesicular pores; few fine flakes of mica; moderately acid.

Table A: Chemical properties for Codorus loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-11	4.21	1.22	0.07	9.20	14.70	37.41
11-18	1.32	0.46	0.06	7.40	9.24	19.91
18-31	1.75	1.19	0.07	6.40	9.41	31.99
31-39	3.00	2.90	0.09	8.20	14.19	42.21
39-45	1.33	1.18	0.08	5.80	8.39	30.87
45-60	0.60	0.47	0.05	3.80	4.92	22.76

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Codorus loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-11	15.6	4.99	0.17	5.67	97.00
11-18	3.00	4.65	1.35	3.19	57.68
18-31	1.00	5.14	0.95	3.96	76.01
31-39	1.70	5.15	1.65	7.64	78.40
39-45	1.40	4.90	1.35	3.94	65.74
45-60	1.00	5.19	0.25	1.37	81.75

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Codorus loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-11	648	98	5	11	--	--
11-18	228	44	2	11	--	--
18-31	276	101	3	9	--	--
31-39	420	120	2	11	--	--
39-45	252	116	5	15	--	--
45-60	192	47	9	12	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Codorus loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-11	3	13	54	159	185	414	440	146
11-18	4	12	42	189	192	439	426	135
18-31	3	10	65	258	195	531	357	112
31-39	4	10	14	73	189	290	546	164
39-45	5	13	66	145	205	434	421	145
45-60	24	98	330	290	89	831	124	45

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Codorus loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
11-39	450	440	50	40	10	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Codorus Series - Supplemental profile 1

Codorus loam, in an area of Suches-Codorus complex, 0 to 2 percent slopes, is located about 0.1 mile east-southeast of the intersection of Highways VA-619 and VA-609 and 1.4 miles west-northwest of the intersection of Highways VA-609 and US-29.

Ap--0 to 3 inches; dark brown (10YR 4/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; many fine and medium flakes of mica; strongly acid; clear smooth boundary.

Bw1--3 ot 13 inches; yellowish red (5YR 4/6) loam; few medium distinct yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; many fine and medium flakes of mica; moderately acid; clear wavy boundary.

Bw2--13 to 30 inches; mottled yellowish red (5YR 4/6) and light brownish gray (2.5Y 6/2) sandy clay loam; weak coarse platy structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; many fine and medium flakes of mica; moderately acid; clear smooth boundary.

C1--30 to 37 inches; mottled light brownish gray (2.5Y 6/2) and strong brown (7.5YR 4/6) clay loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; many fine flakes of mica; strongly acid; abrupt smooth boundary.

Ab--37 to 40 inches; mottled yellowish brown (10YR 5/4) and dark brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; 2 percent rock fragments; common fine flakes of mica; moderately acid; clear smooth boundary.

Bwb2--40 to 53 inches; brown (7.5YR 4/4) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; 2 percent rock fragments, common fine flakes of mica; moderately acid; clear smooth boundary.

Bwb3--53 to 61 inches; mottled brown (10YR 5/3), dark yellowish brown (10YR 4/6), and yellowish red (5YR 5/8) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; 10 percent rock fragments; common fine flakes of mica; moderately acid; abrupt wavy boundary.

2C2--61 to 65 inches; variegated red, brown, yellow, and white granite gneiss that crushes to sandy loam; massive; very friable; moderately acid.

Table C: Chemical properties* for Codorus loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-3	302	58	11	53	--	--
3-13	336	64	13	21	--	--
13-30	302	60	10	17	--	--
30-37	269	54	33	12	--	--
37-40	151	24	49	13	--	--
40-53	202	44	30	32	--	--
53-61	219	54	20	24	--	--
61-65	588	52	125	39	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Codorus loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-3	8	18	54	232	188	500	323	177
3-13	4	10	50	162	178	404	369	227
13-30	4	14	38	270	214	540	246	214
30-37	4	10	26	118	122	280	383	337
37-40	16	30	84	192	110	432	301	267
40-53	12	24	74	170	102	382	341	277
53-61	12	28	74	192	128	434	299	267
61-65	30	74	136	258	166	664	249	87

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Codorus Series - Supplemental profile 2

Codorus clay loam in an area of Codorus silt loam, 0 to 2 percent slopes, is located about 1.1 miles north of the intersection of Highways VA-609 and VA-672 and 1.3 miles northeast of the intersection of Highways VA-623 and US-33.

Ap--0 to 9 inches; yellowish brown (10YR 5/4) clay loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; common fine discontinuous tubular pores between peds; 4 percent rock fragments; common fine flakes of mica; neutral; abrupt smooth boundary.

Bt1--9 to 23 inches; yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; few faint clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt2--23 to 30 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct strong brown (7.5YR 5/8) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; few faint clay films on faces of peds; common fine flakes of mica; very strongly acid; clear wavy boundary.

Bt3--30 to 37 inches; yellowish brown (10YR 5/6) clay loam; common fine and medium distinct strong brown (7.5YR 5/8) and light brownish gray (10YR 6/2) mottles; weak medium and coarse platy structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; few very fine and fine roots; few faint clay films on faces of peds; common fine flakes of mica; very strongly acid; clear wavy boundary.

C1--37 to 53 inches; dark yellowish brown (10YR 4/4) sandy clay loam; common medium distinct light brownish gray (2.5Y 6/2), strong brown (7.5YR 5/8), and very dark grayish brown (10YR 3/2) mottles; massive; friable, slightly sticky, slightly plastic; few very fine roots; common fine flakes of mica; strongly acid; abrupt smooth boundary.

2C2--53 to 61+ inches; yellowish brown (10YR 5/4) extremely cobbly sandy clay loam; massive; friable, slightly sticky, slightly plastic; 70 percent rock fragments; few fine flakes of mica; strongly acid.

Table C: Chemical properties* for Codorus clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-9	804	120	7	14	--	11.2
9-23	252	62	8	9	--	0.4
23-30	120	60	7	11	--	0.4
30-37	120	77	8	11	--	0.6
37-53	168	101	11	12	--	2.2
53-61	216	108	23	18	--	4.8

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Codorus clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-9	2	10	22	112	142	288	404	308
9-23	8	24	20	78	94	224	452	324
23-30	2	6	16	72	94	190	426	384
30-37	2	6	50	142	120	320	396	284
37-53	14	52	160	240	88	554	222	224
53-61	116	122	176	144	46	604	192	204

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Codorus Series - Supplemental profile 3

Codorus silt loam, 0 to 2 percent slopes, is located about 0.9 mile northwest of the intersection of Highways VA-609 and VA-619 and 1.7 miles northeast of the intersection of Highways US-33 and VA-609.

Ap1--0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; 2 percent rock fragments; common fine flakes of mica; very strongly acid; abrupt smooth boundary.

Ap2--6 to 13 inches; dark brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; 2 percent rock fragments; common fine flakes of mica; moderately acid; abrupt smooth boundary.

Bt1--13 to 20 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint strong brown (7.5YR 5/8) mottles; few very fine roots; few faint clay films on faces of peds; common fine flakes of mica; strongly acid; clear smooth boundary.

Bt2--20 to 36 inches; mottled brown (7.5YR 5/4), gray (10YR 6/1), and yellowish brown (10YR 5/4) silty clay loam; weak coarse platy structure parting to moderate fine subangular blocky; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds; many fine flakes of mica; moderately acid; clear smooth boundary.

BCt--36 to 43 inches; mottled gray (10YR 5/1) and brown (7.5YR 5/4) loam; weak medium platy structure parting to weak very fine subangular blocky; friable, slightly sticky, slightly plastic; many fine and medium flakes of mica; slightly acid; clear smooth boundary.

C1--43 to 51 inches; mottled gray (10YR 6/1) and brown (7.5YR 5/8) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica; slightly acid; abrupt smooth boundary.

2C2--51 to 61 inches; mottled in shades of brown and gray sandy loam; massive; very friable; 4 percent rock fragments; common fine flakes of mica; moderately acid.

Table C: Chemical properties* for Codorus silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	540	95	7	42	--	--
6-13	648	105	5	12	--	--
13-20	372	120	3	4	--	--
20-36	468	120	3	6	--	--
36-43	672	120	4	6	--	--
43-51	528	120	6	8	--	--
51-61	288	120	20	9	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Codorus silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	8	30	31	48	87	204	559	237
6-13	12	19	28	48	97	204	549	247
13-20	7	18	15	43	107	190	514	296
20-36	1	7	11	56	110	185	495	320
36-43	4	12	46	181	171	414	344	242
43-51	1	9	76	206	204	496	269	235
51-61	39	176	283	181	62	741	108	151

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Codorus silt loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
13-36	52	33	5	3	6	1	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Table F: Clay mineralogy* for Codorus silt loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
13-36	80	50	200	520	50	--	--	50

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Comus Series

Soils of the Comus series are very deep and well drained. These soils formed in recent alluvial materials weathered from crystalline rocks. They are on floodplains in the Piedmont physiographic province. Slopes range from 0 to 2 percent.

A typical pedon of Comus fine sandy loam is located about 0.6 mile southwest (242 degrees) of the intersection of Highways VA-604 and VA-648, 1.3 miles east (82 degrees) of the intersection of Highways VA-602 and VA-603, and 1 mile west of Celt.

Ap--0 to 7 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable; many very fine, fine, and medium roots; few fine discontinuous tubular pores; strongly acid; abrupt smooth boundary.

Bw1--7 to 16 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular and subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; common very fine and fine roots; common fine discontinuous tubular pores; 2 percent rock fragments; few fine flakes of mica; moderately acid; clear wavy boundary.

Bw2--16 to 25 inches; dark yellowish brown (10YR 4/6) fine sandy loam; weak fine subangular blocky structure; friable; common very fine and fine roots; common fine discontinuous tubular pores; few fine flakes of mica; moderately acid; clear smooth boundary.

Bw3--25 to 37 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; common fine discontinuous tubular pores; few fine flakes of mica; moderately acid; clear smooth boundary.

C1--37 to 45 inches; yellowish brown (10YR 5/4) loam; common fine distinct strong brown (7.5YR 4/6) and dark yellowish brown (10YR 4/4) mottles; massive; friable, slightly sticky, slightly plastic; common very fine and fine roots; few fine vesicular pores; 2 percent rock fragments; few fine flakes of mica; moderately acid; clear smooth boundary.

C2--45 to 63 inches; mottled strong brown (7.5YR 4/6), yellowish brown (10YR 5/4), and grayish brown (10YR 5/2) loamy sand; single grain; loose; few very fine and fine roots; common fine vesicular pores; few fine flakes of mica; moderately acid.

Table A: Chemical properties for Comus fine sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-7	2.55	0.74	0.08	4.40	7.77	43.37
7-16	4.34	0.77	0.06	5.00	10.17	50.84
16-25	3.23	0.51	0.04	5.20	8.98	42.09
25-37	3.43	0.58	0.04	5.80	9.85	41.12
37-45	2.86	0.57	0.04	6.80	10.27	33.79
45-63	1.05	0.28	0.03	4.40	5.76	23.61
63+	--	--	--	--	--	--

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Comus fine sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-7	14.9	5.41	0.05	3.42	98.54
7-16	15.2	5.96	0.05	5.22	99.04
16-25	6.40	6.36	0.05	3.83	98.69
25-37	4.10	6.26	0.05	4.10	98.78
37-45	3.00	6.09	0.05	3.52	98.58
45-63	1.00	5.93	0.05	1.41	96.45
63+	--	--	--	--	--

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Comus fine sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-7	408	59	6	12	--	--
7-16	804	66	3	6	--	--
16-25	480	42	3	8	--	--
25-37	408	39	2	4	--	--
37-45	348	37	1	4	--	--
45-54	240	27	1	3	--	--
54-63	156	20	2	3	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Comus fine sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-7	32	87	242	317	98	776	147	77
7-16	8	14	88	317	166	593	272	135
16-25	3	11	97	276	141	528	308	164
25-37	1	13	99	276	183	572	282	146
37-45	2	33	148	276	148	607	263	126
45-63	12	89	385	327	55	868	81	51

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Comus fine sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
16-37	310	560	10	40	30	50	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Craigsville Series

Soils of the Craigsville series are very deep and well drained. These soils formed in recent alluvial materials weathered from crystalline rocks. They are on floodplains in the Blue Ridge and Piedmont physiographic provinces. Slopes range from 0 to 2 percent.

A typical pedon of Craigsville cobbly sandy loam is located about 0.2 mile west (262 degrees) of the intersection of Highways VA-637 and VA-638, 0.3 mile southeast (138 degrees) of the intersection of Highways VA-637 and VA-634, and 3 miles north of Stanardsville.

Ap--0 to 6 inches; brown (10YR 4/3) cobbly sandy loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; common fine discontinuous tubular pores; 32 percent rock fragments; moderately acid; abrupt wavy boundary.

Bw--6 to 22 inches; strong brown (7.5YR 5/6) very gravelly sandy loam; weak fine subangular blocky structure; friable; common very fine, fine, and medium roots; common fine discontinuous tubular pores; 40 percent rock fragments; strongly acid; gradual smooth boundary.

2C--22 to 64 inches; brown (7.5YR 4/4) extremely cobbly loamy sand; single grain; loose; few very fine and fine roots; many fine vesicular pores; 65 percent rock fragments; strongly acid.

Table A: Chemical properties for Craigsville cobbly sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-6	2.10	0.47	0.41	20.40	23.38	12.75
6-22	0.36	0.12	0.11	9.20	9.79	6.03
22-64	0.74	0.17	0.15	7.20	8.26	12.83

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Craigsville cobbly sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-6	3.7	5.32	0.95	3.93	75.83
6-22	1.0	5.10	1.05	1.64	35.98
22-64	0.8	5.60	0.25	1.31	80.92

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Craigsville cobbly sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	336	37	45	44	--	--
6-22	60	8	35	20	--	--
22-64	180	24	25	45	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Craigsville cobbly sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	115	162	143	96	50	566	272	162
6-22	134	209	165	124	56	688	200	112
22-64	177	239	211	108	44	779	125	96

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Craigsville cobbly sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
6-22	410	190	20	20	30	350	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Photograph 3: A profile of Craigsville cobbly sandy loam.

Photograph 4: Hay on Craigsville cobbly sandy loam.

Dyke Series

Soils of the Dyke series are very deep and well drained. These soils formed in colluvial and alluvial materials weathered from crystalline rocks. They are on alluvial fans and terraces in the Blue Ridge and Piedmont physiographic provinces. Slopes range from 2 to 15 percent.

A typical profile of Dyke clay loam, 2 to 7 percent slopes, severely eroded, is located 1 mile east (82 degrees) of the intersection of Highways VA-609 and VA-619, 0.9 mile north-northwest (340 degrees) of the intersection of Highways US-29 and VA-609, and 3.7 miles north of Ruckersville.

Ap--0 to 8 inches; dark reddish brown (5YR 3/3) clay loam; moderate fine granular structure; friable, sticky, plastic; many very fine, fine and medium roots; common fine discontinuous pores; moderately acid; abrupt smooth boundary.

Bt1--8 to 29 inches; dark red (2.5YR 3/6) clay; moderate fine subangular blocky structure; firm, very sticky, very plastic; few very fine roots; common fine discontinuous tubular pores; thin continuous clay films on faces of peds; few fine flakes of mica; strongly acid; gradual smooth boundary.

Bt2--29 to 48 inches; dark red (2.5YR 3/6) clay; moderate fine subangular blocky structure; firm, very sticky, very plastic; few very fine roots; common fine discontinuous tubular pores; thin continuous clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual smooth boundary.

Bt3--48 to 75 inches; dark red (2.5YR 3/6) clay; weak fine subangular blocky structure; firm, very sticky, very plastic; few very fine roots; common fine discontinuous tubular pores; thin patchy clay films on faces of peds; few fine flakes of mica; very strongly acid.

Table A: Chemical properties for Dyke clay loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-8	4.93	1.68	0.50	10.40	17.51	40.61
8-29	3.99	2.70	0.24	11.60	18.53	37.40
29-48	0.42	1.40	0.25	14.60	16.67	12.42
48-75	0.34	1.30	0.31	14.20	16.15	12.07

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Dyke clay loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-8	19.9	5.80	0.15	7.26	97.93
8-29	3.0	5.59	0.35	7.28	95.19
29-48	1.4	4.72	2.85	4.92	42.07
48-75	1.0	4.83	2.95	4.90	39.80

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Dyke clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-8	684	120	6	63	--	--
8-29	324	117	9	9	--	--
29-48	72	51	11	11	--	--
48-75	72	54	12	17	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Dyke clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-8	5	15	47	92	56	215	342	443
8-29	7	11	30	64	46	158	171	671
29-48	4	12	29	64	40	149	123	728
48-75	6	13	30	62	43	154	112	734

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Dyke clay loam

Depth*	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
8-29	250	20	--	700	30	--	TR	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Elioak Series

Soils of the Elioak series are very deep and well drained. These soils formed in materials weathered from granite gneiss, phyllite, mica schist, and graywacke sandstone. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 25 percent.

A typical pedon of Elioak loam, 2 to 7 percent slope, is located 0.5 mile north (10 degrees) of the intersection of Highways VA-608 and US-33, 0.4 mile southeast (140 degrees) of the intersection of Highways VA-609 and US-33, and 1 mile north of Quinque.

Oi--2 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 6 inches; brown (7.5YR 4/4) loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common fine discontinuous tubular pores; very strongly acid; clear smooth boundary.

Bt1--6 to 26 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine, fine, and medium roots; common fine discontinuous tubular pores; thin continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2--26 to 32 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; common fine discontinuous tubular pores; thin continuous clay films on faces of peds; many fine flakes of mica; very strongly acid; clear smooth boundary.

Bt3--32 to 49 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; common fine discontinuous tubular pores; thin continuous clay films on faces of peds; many fine flakes of mica; very strongly acid; clear smooth boundary.

C--49 to 72 inches; mottled red (2.5YR 4/8), pinkish white (5YR 8/2), strong brown (7.5YR 5/6), and yellowish red (5YR 5/8) fine sandy loam; massive; friable; few very fine and fine roots; common fine vesicular pores; few thin clay flows in root channels; very strongly acid.

Table A: Chemical properties for Elioak loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-6	0.02	0.01	0.10	8.97	9.10	1.43
6-26	0.08	0.79	0.21	13.03	14.11	7.65
26-32	0.00	0.34	0.12	10.02	10.48	4.39
32-49	0.00	0.14	0.09	8.97	9.20	2.50
49-72	0.00	0.07	0.09	5.70	5.86	2.73

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Elioak loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-6	19.7	4.2	2.26	2.39	5.44
6-26	7.2	4.9	3.67	4.75	22.74
26-32	2.9	5.2	3.38	3.84	11.98
32-49	1.4	5.1	3.48	3.71	6.20
49-72	0.9	5.0	2.63	2.79	5.73

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table D: Particle-size distribution* for Elioak loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	32	38	100	207	121	498	351	151
6-26	12	16	25	53	58	164	156	680
26-32	28	31	37	96	114	306	149	545
32-49	26	30	43	117	140	356	235	409
49-72	42	62	67	215	234	620	229	151

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Elioak loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
6-26	280	--	--	700	20	--	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Photograph 5: Pasture on Elioak clay loam, 7 to 15 percent slopes in the foreground with a farmstead on Dyke clay loam, 2 to 7 percent slopes, in the background.

Elioak Series - Supplemental profile 1

Elioak sandy clay loam, in an area of Elioak loam, 2 to 7 percent slopes, is located about 0.8 mile south-southeast of the intersection of Highways VA-609 and US-33 and 0.5 mile southeast of the water tower on Highway US-33.

Ap--0 to 7 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine and few fine and medium roots; few fine flakes of mica; very strongly acid; abrupt smooth boundary.

E--7 to 11 inches; strong brown (7.5YR 5/8) loam; weak fine subangular blocky structure; firm, slightly sticky, slightly plastic; few fine and medium roots; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bt1--11 to 14 inches; yellowish red (5YR 5/6) clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; thin patchy clay films on faces of peds; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bt2--14 to 37 inches; red (2.5YR 5/6) clay; few medium distinct strong brown (7.5YR 5/8) mottles; moderate fine angular blocky structure; firm, sticky, plastic; few fine roots in upper part; thin continuous clay films on faces of peds; few fine flakes of mica; strongly acid; gradual smooth boundary.

Bt3--37 to 63 inches; red (2.5YR 4/6) clay; few medium faint dark red (2.5YR 3/6) mottles; moderate fine and medium angular blocky structure; thin continuous clay films on faces of peds; common fine flakes of mica; strongly acid; gradual smooth boundary.

Table D: Particle-size distribution* for Elioak sandy clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-7	32	56	110	218	110	526	265	209
7-11	26	44	90	184	94	438	299	263
11-14	36	44	76	146	72	374	250	376
14-20	22	30	64	128	70	314	176	510
20-37	18	30	52	98	58	256	143	601
37-43	22	30	47	96	60	255	161	584
43-50	12	20	38	98	100	268	153	579
50-63	19	28	54	143	116	360	203	437

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 2

Elioak loam, 2 to 7 percent slopes, is located about 0.6 mile north of the intersection of Highways VA-608 and US-33 and 0.3 mile southeast of the water tower on Highway US-33.

Oi--2 to 0 inches; partially decomposed leaves and twigs.

A--0 to 4 inches; dark yellowish brown (10YR 4/4) loam; moderate very fine and fine granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; 8 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1--4 to 11 inches; yellowish red (5YR 5/6) loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; thin very patchy clay films on faces of peds; 2 percent rock fragments; very strongly acid; clear smooth boundary.

Bt2--11 to 29 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine, fine, and medium roots; thin continuous clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3--29 to 39 inches; red (2.5YR 4/6) clay; few medium distinct strong brown (7.5YR 5/6) mottles; moderate coarse platy structure parting to moderate very fine and fine subangular blocky; firm, sticky, plastic; few very fine, fine, and medium roots; thin continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt4--39 to 60 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; thin patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

Ct--60 to 80 inches; red (2.5YR 4/8) sandy clay loam; common fine and medium distinct dark reddish brown (5YR 3/2) and light red (2.5YR 6/8) mottles; massive; friable, slightly sticky, slightly plastic; few thin clay flows in relic rock joints; strongly acid.

Table C: Chemical properties* for Elioak loam

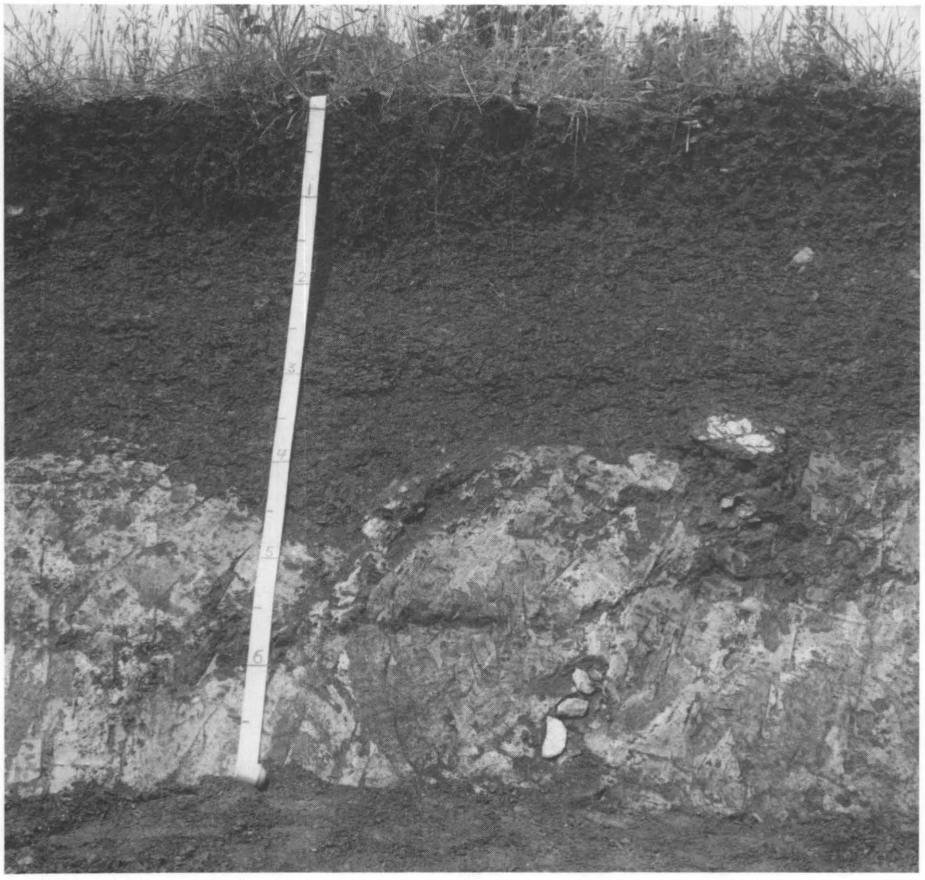
Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	42	5	2	40	--	--
4-11	42	2	1	24	--	--
11-29	42	118	5	34	--	--
29-39	56	76	4	44	--	--
39-60	42	28	2	22	--	--
60-80	42	20	2	24	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	10	46	134	200	105	495	309	196
4-11	18	25	104	194	109	450	284	266
11-29	2	6	38	93	58	197	196	607
29-39	2	7	36	110	89	244	177	579
39-60	4	14	48	158	190	414	150	436
60-80	10	26	68	216	248	568	149	283

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.



Photograph 6: A profile of Elioak loam, 2 to 7 percent slopes.

Elioak Series - Supplemental profile 3

Elioak gravelly loam, in an area of Elioak loam 2 to 7 percent slopes, is located about 1 mile south-southwest of the intersection of Highways US-33 and VA-743 and .03 mile north of the intersection of Highways VA-743 and VA-671.

Ap--0 to 7 inches; brown (7.5YR 4/4) gravelly loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 26 percent rock fragments; very strongly acid; gradual smooth boundary.

Bt1--7 to 27 inches; red (2.5YR 4/8) clay; moderate fine subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thin patchy clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2--27 to 40 inches; red (2.5YR 4/8) clay; moderate medium platy structure parting to moderate fine subangular blocky; firm, sticky, plastic; few very fine, fine, and medium roots; thin continuous clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt3--40 to 47 inches; red (2.5YR 4/8) clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine, fine, and medium roots; thin very patchy clay films on faces of peds and in root channels; strongly acid; abrupt smooth boundary.

C--47 to 72 inches; red (2.5YR 4/8) fine sandy loam; common medium prominent white (10YR 8/1) and strong brown (7.5YR 5/8) mottles and many medium distinct yellowish red (5YR 5/6) mottles; massive; friable; few very fine and fine roots; strongly acid.

Table A: Chemical properties for Elioak gravelly loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-7	0.0	0.0	0.1	10.4	10.5	1.0
7-27	0.0	1.2	0.2	11.3	12.7	11.0
27-40	0.0	0.5	0.2	11.3	12.0	5.8
40-47	0.0	0.2	0.1	10.2	10.5	2.9
47-72	0.0	0.1	0.1	8.2	8.4	2.4

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Elioak gravelly loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-7	2.2	4.7	2.0	2.10	4.76
7-27	0.6	5.1	2.7	4.10	34.15
27-40	0.2	5.4	2.6	3.30	21.21
40-47	0.2	5.4	2.5	2.80	10.71
47-72	0.1	5.4	2.5	2.70	7.41

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table D: Particle-size distribution* for Elioak gravelly loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-7	25	32	120	170	70	417	307	276
7-27	7	22	58	104	51	242	175	583
27-40	7	21	63	150	88	329	127	544
40-47	12	32	83	184	110	421	175	404
47-72	6	30	104	264	168	572	184	244

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Elioak gravelly loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
7-27	250	--	--	370	50	--	20	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Elioak Series - Supplemental profile 4

Elioak clay loam, 7 to 15 percent slopes, is located about 0.2 mile southeast of the intersection of Highways VA-633 and VA-640 and .08 mile south of Highway VA-633.

Ap--0 to 6 inches; reddish brown (5YR 4/3) clay loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; 6 percent rock fragments; few fine flakes of mica; moderately acid, abrupt smooth boundary.

Bt1--6 to 30 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; thin continuous clay films on faces of peds; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt2--30 to 34 inches; red (2.5YR 4/6) sandy clay; many medium distinct dark reddish brown (5YR 3/4) mottles; moderate fine and medium subangular blocky structure; firm, sticky, plastic; patchy clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.

Ct--34 to 68 inches; mottled red (2.5YR 4/6), yellowish red (5YR 4/6), and dark reddish brown (5YR 3/3) fine sandy loam; massive; friable; common fine discontinuous vesicular pores; few thin clay flows in relic rock joints; common fine flakes of mica; strongly acid.

Table A: Chemical properties for Elioak clay loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-6	5.0	1.7	0.7	8.5	15.9	46.5
6-16	2.1	2.2	0.4	9.7	14.4	32.6
16-30	0.1	1.0	0.4	12.7	14.2	10.6
30-34	0.0	0.3	0.2	11.5	12.0	4.2
34-68	0.0	0.1	0.2	10.0	10.3	2.9

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Elioak clay loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-6	3.5	5.6	0.1	7.50	98.67
6-16	0.8	5.4	0.9	5.60	83.93
16-30	0.2	5.3	3.8	5.30	28.30
30-34	0.1	5.2	4.1	4.60	10.87
34-68	0.0	5.1	3.8	4.10	7.32

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Elioak clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	896	193	6	147	--	--
6-16	280	189	2	92	--	--
16-30	56	78	2	86	--	--
30-34	42	35	4	58	--	--
34-68	70	32	6	40	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	12	13	110	207	110	452	244	304
6-16	10	18	68	145	88	329	195	476
16-30	8	16	38	140	98	300	101	599
30-34	7	19	59	218	148	451	85	464
34-68	10	34	87	290	200	621	214	165

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Elioak clay loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
6-16	300	50	--	330	30	--	10	--
16-30	400	50	--	400	50	50	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Elioak Series - Supplemental profile 5

Elioak sandy clay loam, in an area of Elioak clay loam, 7 to 15 percent slopes, is located about .04 mile west of the intersection of Highways VA-743 and VA-607, and .06 mile east of the intersection of Highways VA-743 and VA-629.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 5 inches; strong brown (7.5YR 5/6) sandy clay loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; 8 percent rock fragments; very strongly acid; clear smooth boundary.

Bt--5 to 22 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky, plastic; many very fine and fine roots; thin continuous clay films on faces of peds; few fine flakes of mica; strongly acid; clear wavy boundary.

Ct--22 to 55 inches; red (2.5YR 4/6) sandy clay loam; few fine distinct strong brown (7.5YR 5/8) mottles; massive; friable, slightly sticky, slightly plastic; few fine and very fine roots in upper part; few thin clay flows in root channels and relic rock joints; common fine flakes of mica; very strongly acid.

Table C: Chemical properties* for Elioak sandy clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-1	56	20	3	30	--	--
1-5	42	158	1	66	--	--
5-22	28	67	2	52	--	--
22-30	28	43	2	41	--	--
30-55	--	--	--	--	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak sandy clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-1	18	34	140	242	104	538	226	236
1-5	20	42	128	216	96	502	224	274
5-8	4	10	60	154	72	300	126	574
8-22	1	10	50	168	88	317	117	566
22-30	2	14	92	304	138	550	152	298
30-55	7	28	137	316	143	631	160	209

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 6

Elioak clay loam, in an area of Elioak loam, 2 to 7 percent slopes, is located about 0.4 mile southwest of the intersection of Highways VA-743 and VA-671 and 0.4 mile north-northeast of the intersection of Highways VA-607 and VA-743.

Ap--0 to 9 inches; reddish brown (5YR 4/4) clay loam; common fine and medium distinct red (2.5YR 4/6) mottle; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 10 percent rock fragments; few fine flakes of mica; neutral; abrupt smooth boundary.

Bt1--9 to 32 inches; red (2.5YR 4/6) clay; moderate medium platy structure parting to very fine and fine subangular blocky; firm, sticky, plastic; few very fine roots; thin patchy clay films on faces of peds; common fine flakes of mica; strongly acid; gradual smooth boundary.

Bt2--32 to 59 inches; red (2.5YR 4/6) clay, common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine roots in upper part; thin patchy clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual smooth boundary.

Ct--59 to 71 inches; red (2.5YR 4/6) clay loam; many fine and medium distinct strong brown (7.5YR 5/8) mottles; massive; friable, slightly sticky, slightly plastic; many thin clay flows; common fine flakes of mica; strongly acid.

Table C: Chemical properties* for Elioak clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-9	798	177	13	30	--	--
9-17	532	177	6	11	--	--
17-32	168	100	5	11	--	--
32-42	42	40	3	12	--	--
42-59	14	13	4	16	--	--
59-71	42	8	8	9	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-9	22	36	90	184	85	417	243	340
9-17	6	8	21	52	34	121	105	774
17-32	2	3	9	50	61	125	115	760
32-42	1	2	10	92	106	211	129	660
42-59	1	2	14	149	164	330	160	510
59-71	1	3	22	226	200	452	188	360

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 7

Elioak gravelly clay loam, in an area of Elioak clay loam, 7 to 15 percent slopes, is located about 0.8 mile west-northwest of the intersection of Highways VA-633 and VA-743 and 1.8 miles northwest of the intersection of Highways VA-743 and US-33.

Ap--0 to 7 inches; yellowish red (5YR 5/6) gravelly clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; 20 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1--7 to 25 inches; red (2.5YR 4/6) clay; weak and moderate medium subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thin continuous clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2--25 to 37 inches; mottled reddish brown (2.5YR 4/4), red (2.5YR 4/6), and light red (2.5YR 6/8) clay; moderate coarse platy structure parting to moderate medium subangular blocky; firm, sticky, plastic; common very fine, fine, medium, and coarse roots; thick patchy clay films on faces of peds; strongly acid; clear irregular boundary.

Ct--37 to 63 inches; mottled yellowish red (5YR 5/6), red (2.5YR 4/6), pink (5YR 7/4), and strong brown (7.5YR 4/6) fine sandy loam; massive; friable; common very fine, fine, and medium roots; few thin clay flows; strongly acid.

Table C: Chemical properties* for Elioak gravelly clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-7	168	43	17	66	--	--
7-25	217	199	6	99	--	--
25-37	84	89	5	52	--	--
37-63	70	52	4	47	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak gravelly clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-7	12	24	69	163	120	388	285	327
7-25	21	20	37	108	110	296	147	557
25-37	14	32	56	166	158	426	125	449
37-63	26	54	90	262	231	663	128	209

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 8

Elioak clay loam, 7 to 15 percent slopes, is located about 0.4 mile north of the intersection of Highways US-33 and VA-743 and 0.9 mile southeast of the intersection of Highways VA-633 and US-33.

Ap--0 to 3 inches; dark reddish brown (5YR 3/4) clay loam; common medium distinct red (2.5YR 3/6) mottles; moderate fine granular structure; friable, slightly sticky, slightly plastic; many very fine roots; 5 percent rock fragments; few fine flakes of mica; very strongly acid; clear smooth boundary.

Bt1--3 to 23 inches; red (2.5YR 4/6) clay; few fine distinct yellowish red (5YR 5/8) mottles in lower part; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; clear irregular boundary.

Bt2--23 to 33 inches; red (2.5YR 4/6) clay; common fine distinct yellowish red (5YR 5/8) and brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual broken boundary.

Ct1--33 to 54 inches; red (2.5YR 4/6) sandy clay loam; many fine distinct brown (7.5YR 4/4), yellowish red (5YR 5/8), and very grayish brown (10YR 3/2) mottles; massive; friable, slightly sticky, slightly plastic; few very fine roots; common thin clay flows; few fine flakes of mica; strongly acid; clear wavy boundary.

2C2--54 to 78 inches; mottled dark brown (7.5YR 32/4), black (N 2/), very pale brown (10YR 8/3), and strong brown (7.5YR 4/6) loamy sand; massive; very friable; many fine flakes of mica; strongly acid.

Table A: Chemical properties for Elioak clay loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-3	3.9	1.1	0.6	15.5	21.1	26.5
3-10	2.3	0.8	0.4	12.4	15.9	22.0
10-23	0.2	0.3	0.2	12.7	13.4	5.2
23-33	0.0	0.2	0.2	13.0	13.4	3.0
33-54	0.0	0.0	0.2	10.9	11.1	1.8
54-78	0.0	0.0	0.1	7.5	7.6	1.3

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Elioak clay loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-3	4.3	4.7	0.8	6.40	87.50
3-10	0.5	5.2	2.4	5.90	59.32
10-23	0.1	4.9	4.0	4.70	14.89
23-33	0.1	5.4	4.3	4.70	8.51
33-54	0.0	5.2	3.3	3.50	5.71
54-78	0.1	5.2	2.4	2.50	4.00

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Elioak clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-3	798	151	6	110	--	--
3-10	280	80	2	62	--	--
10-23	98	50	4	56	--	--
23-33	70	23	7	38	--	--
33-54	70	15	13	45	--	--
54-78	56	8	35	24	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	30	28	90	185	78	411	166	423
3-10	25	14	29	101	74	243	202	555
10-23	21	18	35	102	75	251	144	605
23-33	14	22	57	197	130	420	150	430
33-54	80	74	87	205	165	611	177	218
54-78	122	78	133	293	168	794	151	55

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Elioak clay loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
3-10	250	--	--	400	20	--	20	--
10-23	350	--	--	470	50	30	30	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Elioak Series - Supplemental profile 9

Elioak clay loam, in an area of Elioak loam, 2 to 7 percent slopes, is located about 0.3 mile south-southwest of the intersection of Highways VA-743 and US-33 and 1.6 miles north-northeast of the intersection of Highways VA-743 and VA-607.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 6 inches; yellowish red (5YR 5/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; extremely acid; abrupt smooth boundary.

Bt1--6 to 31 inches; red (2.5YR 4/6) clay; few fine distinct strong brown (7.5YR 5/8) mottles in the lower part; moderate coarse platy structure parting to moderate fine subangular blocky; firm, sticky, plastic; common very fine, fine, and medium roots; thin continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2--31 to 59 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/8), white (10YR 8/2), yellow (10YR 7/6), and light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; few fine roots; thin continuous clay films on faces of peds; very strongly acid; diffuse irregualr boundary.

Ct--59 to 73 inches; red (2.5YR 4/6) clay loam; common medium distinct strong brown (7.5YR 5/8), white (10YR 8/2), yellow (10YR 7/6), and light gray (10YR 7/2) mottles; massive; friable, slightly sticky, slightly plastic; few very fine roots; few fine clay flows; very strongly acid.

Table C: Chemical properties* for Elioak clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	84	18	2	36	--	--
6-22	70	199	1	36	--	--
22-31	70	60	1	34	--	--
31-45	70	20	0	15	--	--
45-59	70	13	0	11	--	--
59-73	70	10	2	15	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	21	39	113	166	76	415	294	291
6-22	8	20	55	90	42	215	173	612
22-31	10	20	50	84	56	220	106	674
31-45	8	12	48	124	104	296	151	553
45-59	8	13	62	156	144	383	183	434
59-73	4	12	58	182	200	456	175	369

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Photograph 7: Hay on Elioak loam, 2 to 7 percent slopes.

Elioak Series - Supplemental profile 10

Elioak gravelly clay, in an area of Elioak clay loam, 7 to 15 percent slopes, is located about 0.3 mile west of the intersection of Highways VA-629 and VA-743 and 0.7 mile north of the intersection of Highway VA-743 and the county line.

Ap--0 to 5 inches; reddish brown (5YR 4/4) gravelly clay; moderate medium subangular blocky structure; friable, sticky, plastic; common very fine roots; 17 percent rock fragments; neutral; clear wavy boundary.

Bt1--5 to 13 inches; red (2.5YR 4/6) clay; common medium faint reddish brown (5YR 4/3) mottles; moderate fine and medium subangular blocky structure; firm, sticky, plastic; common very fine roots; thin continuous clay films on faces of peds; 5 percent rock fragments; slightly acid; clear wavy boundary.

Bt2--13 to 30 inches; red (2.5YR 4/6) clay; common medium distinct brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine roots; thin patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

Ct1--30 to 40 inches; brown (10YR 4/3) clay loam; many coarse distinct red (2.5YR 4/6) mottles; massive; friable, slightly sticky, slightly plastic; few thick clay flows; very strongly acid; clear wavy boundary.

Ct2--40 to 51 inches; brown (10YR 4/3) sandy clay loam; many coarse distinct red (2.5YR 4/6) mottles; massive; friable, slightly sticky, slightly plastic; few thick clay flows; very strongly acid; clear smooth boundary.

C3--51 to 72 inches; mottled yellowish red (5YR 5/8), red (2.5YR 5/8), pinkish white (7.5YR 8/2), and dark grayish brown (10YR 4/2) fine sandy loam; massive; friable; very strongly acid.

Table C: Chemical properties* for Elioak gravelly clay

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-5	1679	199	94	106	--	--
5-13	910	199	9	16	--	--
13-30	112	81	9	28	--	--
30-40	56	23	3	34	--	--
40-51	56	15	5	32	--	--
51-72	56	15	5	30	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak gravelly clay

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-5	52	38	56	120	86	352	138	510
5-13	30	22	23	54	80	209	122	669
13-30	47	34	29	69	98	277	156	567
30-40	60	42	35	99	154	390	210	400
40-51	78	48	43	128	206	503	230	267
51-72	64	50	46	166	240	566	247	187

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 11

Elioak sandy clay loam, in an area of Elioak clay loam, 7 to 15 percent slopes, is located about 0.4 mile south-southwest of the intersection of Highways VA-633 and VA-629 and 1.5 miles north-northwest of the intersection of Highways VA-633 and VA-623.

Ap--0 to 2 inches; dark reddish brown (5YR 3/4) sandy clay loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 10 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1--2 to 6 inches; mottled yellowish red (5YR 4/6) and red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thin patchy clay films on faces of peds; 4 percent rock fragments; very strongly acid; clear smooth boundary.

Bt2--6 to 23 inches; red (2.5YR 4/6) clay; weak moderate angular blocky structure; firm, sticky, plastic; few very fine, fine, and medium and common coarse roots; thin continuous clay films on faces of peds; strongly acid; clear wavy boundary.

Ct1--23 to 37 inches; mottled red (2.5YR 5/8), reddish yellow (5YR 6/8), and brown (10YR 4/3) clay loam; massive; friable, slightly sticky, slightly plastic; few very fine, fine, and medium roots; common thin clay flows; strongly acid; gradual wavy boundary.

C2--37 to 74 inches; mottled red (2.5YR 5/8), reddish yellow (5YR 6/8), and brown (10YR 4/3) fine sandy loam; massive; friable; few very fine and fine roots; strongly acid.

Table C: Chemical properties* for Elioak sandy clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-2	462	179	7	116	--	--
2-6	112	115	4	110	--	--
6-23	56	189	4	99	--	--
23-37	70	81	6	54	--	--
37-56	56	53	7	54	--	--
56-74	42	63	10	59	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak sandy clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-2	18	38	80	174	140	450	286	264
2-6	12	20	40	126	142	340	206	454
6-23	8	12	20	64	92	196	130	674
23-37	8	20	35	147	204	414	222	364
37-56	16	30	52	198	284	580	233	187
56-74	6	22	50	198	306	582	269	149

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 12

Elioak gravelly clay loam, in an area of Elioak loam, 2 to 7 percent slopes, is located about 0.5 mile south of the intersection of Highways VA-623 and US-33 and 0.4 mile southwest of the Greene County Technical Center.

Ap--0 to 6 inches; reddish yellow (7.5YR 6/6) gravelly clay loam; common medium faint brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 17 percent rock fragments; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt1--6 to 13 inches; yellowish red (5YR 5/6) clay; common medium distinct red (2.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; few thin patchy clay films on faces of peds; 11 percent rock fragments; common fine flakes of mica; very strongly acid; gradual smooth boundary.

Bt2--13 to 37 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; many thin continuous clay films on faces of peds; 10 percent rock fragments; common fine flakes of mica; strongly acid; gradual smooth boundary.

C1--37 to 57 inches; red (2.5YR 4/6) clay loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; 2 percent rock fragments; many fine flakes of mica; strongly acid; gradual smooth boundary.

C2--57 to 69 inches; yellowish red (5YR 5/6) loam; massive; friable, slightly sticky, slightly plastic; few very fine roots; 2 percent rock fragments; many fine flakes of mica; strongly acid.

Table A: Chemical properties for Elioak gravelly clay loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
2-4	0.03	0.10	0.06	7.63	7.82	2.43
4-6	0.01	0.04	0.07	5.34	5.46	2.20
6-8	0.01	0.04	0.07	6.43	6.55	1.83
10-12	0.01	0.07	0.08	4.69	4.85	3.30
14-16	0.02	0.17	0.11	5.12	5.42	5.54
18-20	0.02	0.31	0.12	4.03	4.48	10.04
22-24	0.02	0.36	0.12	3.82	4.32	11.57
26-28	0.03	0.55	0.14	6.43	7.15	10.07
30-32	0.02	0.68	0.13	4.14	4.97	16.70
34-36	0.05	1.02	0.13	4.69	5.89	20.37

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Elioak gravelly clay loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
2-4	--	5.4	2.02	2.21	8.60
4-6	--	5.4	1.56	1.68	7.14
6-8	--	5.4	1.84	1.96	6.12
10-12	--	5.3	1.29	1.45	11.03
14-16	--	5.4	1.47	1.77	16.95
18-20	--	5.2	1.01	1.46	30.82
22-24	--	5.5	0.92	1.42	35.21
26-28	--	5.5	1.29	2.01	35.82
30-32	--	5.7	1.10	1.93	43.01
34-36	--	5.5	0.92	2.12	56.60

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Elioak gravelly clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	118	8	3	26	--	--
6-13	101	6	2	23	--	--
13-25	84	46	2	49	--	--
25-37	67	26	4	23	--	--
37-57	67	6	5	10	--	--
57-69	67	2	5	12	--	--
69-84	51	2	6	12	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak gravelly clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-6	4	10	24	114	164	316	404	280
6-13	10	2	10	76	162	260	320	420
13-37	0	2	2	44	116	164	257	579
37-57	0	2	14	122	236	374	326	300
57-69	0	0	2	98	472	572	350	8

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 13

Elioak clay loam, in an area of Elioak loam, 2 to 7 percent slopes, is located 0.2 mile southeast of the intersection of Highways VA-743 and US-33 and 1 mile northeast of the intersection of Highways VA-743 and VA-671.

Ap--0 to 6 inches; dark reddish brown (5YR 3/4) clay loam; common fine faint dark red (2.5YR 3/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; 2 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1--6 to 26 inches; dark red (2.5YR 3/6) clay; moderate fine angular blocky structure; firm, sticky, plastic; common fine roots; thin continuous clay films on faces of peds; 1 percent rock fragments; strongly acid; gradual smooth boundary.

Bt2--26 to 40 inches; dark red (2.5YR 3/6) clay; moderate fine angular blocky structure; firm, sticky, plastic; few fine roots; thin continuous clay films on faces of peds; 2 percent rock fragments; strongly acid; gradual wavy boundary.

Bt3--40 to 62 inches; red (2.5YR 4/6) clay; moderate fine subangular blocky structure; firm, sticky, plastic; thin patchy clay films on faces of peds; 2 percent rock fragments; strongly acid; clear wavy boundary.

Ct--62 to 78 inches; brown (7.5YR 4/4) clay; massive; firm, sticky, plastic; common clay flows; 2 percent rock fragments; strongly acid.

Table C: Chemical properties* for Elioak clay loam

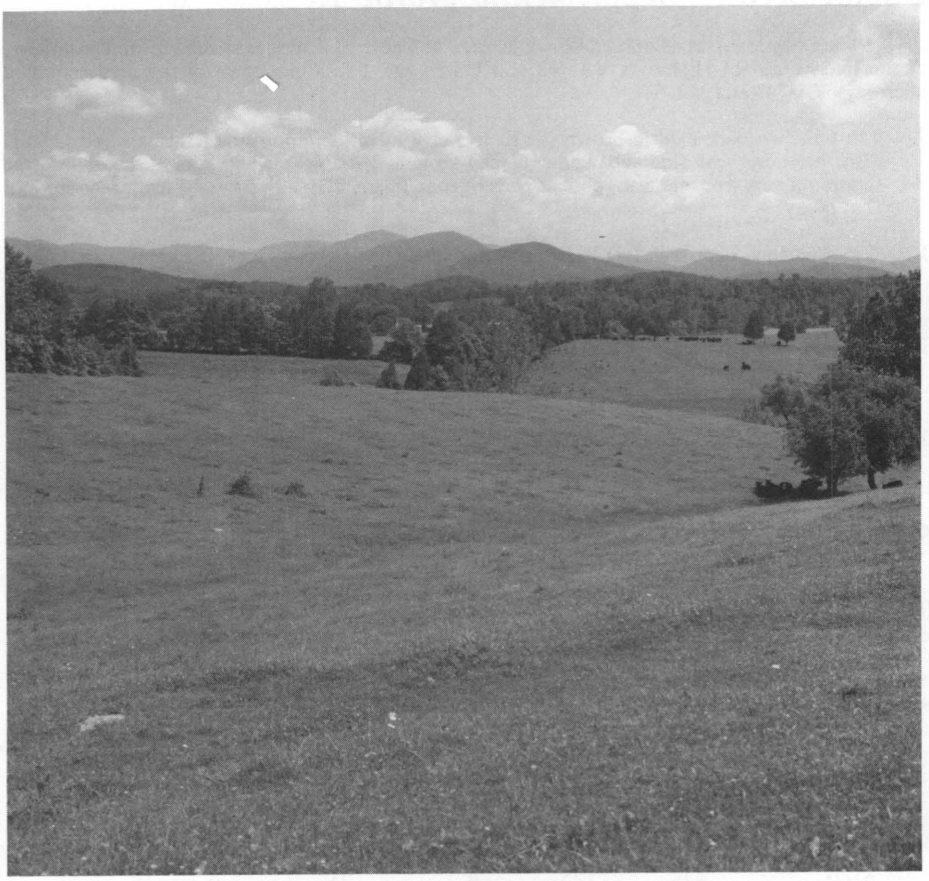
Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-6	658	198	41	134	--	--
6-26	196	178	3	36	--	--
26-40	70	53	2	36	--	--
40-62	56	47	4	32	--	--
62-78	42	35	4	23	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-6	8	18	44	138	124	332	274	394
6-26	2	8	18	60	60	148	168	684
26-40	2	6	18	68	68	162	174	664
40-62	2	4	14	68	84	172	193	635
62-78	2	2	22	150	176	352	200	448

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.



Photograph 8: Pasture on Elioak loam, 7 to 15 percent slopes, on uplands and Meadowville fine sandy loam, 2 to 7 percent slopes, along small intermittent drains.

Elioak Series - Supplemental profile 14

Elioak loam, 2 to 7 percent slopes, is located about 0.65 mile northwest of the intersection of Highways VA-675 and VA-622 and 0.85 mile north of the intersection of Highways VA-622 and VA-624.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

A--0 to 3 inches; dark grayish brown (10YR 4/2) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 2 percent rock fragments; extremely acid; abrupt smooth boundary.

BE--3 to 13 inches; yellowish brown (10YR 5/4) clay loam; weak very fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 5 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1--13 to 28 inches; yellowish red (5YR 5/6) clay; many medium distinct red (2.5YR 4/6) and strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thin patchy clay films on faces of peds; 7 percent rock fragments; strongly acid; gradual smooth boundary.

Bt2--28 to 48 inches; mottled red (2.5YR 4/6), strong brown (7.5YR 5/6), and yellowish red (5YR 5/6) clay; moderate medium angular blocky structure; firm, sticky, plastic; few very fine, fine, and medium roots; thin patchy clay films on faces of peds; 7 percent rock fragments; strongly acid; clear smooth boundary.

2Bt3--48 to 61 inches; red (2.5YR 4/8) clay loam; many medium distinct reddish yellow (7.5YR 6/8) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; thin patchy clay films on faces of peds; 5 percent rock fragments; few fine flakes of mica; strongly acid; gradual wavy boundary.

2Bt4--61 to 68 inches; red (2.5YR 4/8) loam; many medium prominent yellow (10YR 7/6) and very pale brown (10YR 7/4) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; thin patchy clay films on faces of peds; 5 percent rock fragments; few fine flakes of mica; strongly acid; gradual irregular boundary.

2Ct--68 to 80 inches; variegated red, brown, yellow, and gray loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; few clay flows; 5 percent rock fragments; few fine flakes of mica; strongly acid.

Table C: Chemical properties* for Elioak loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-3	67	14	5	49	--	--
3-13	51	6	6	21	--	--
13-28	51	96	6	53	--	--
28-48	51	32	8	34	--	--
48-61	51	14	3	17	--	--
61-68	34	10	4	17	--	--
68-80	51	8	4	13	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	44	80	64	82	116	386	394	220
3-13	40	72	56	68	133	369	351	280
13-28	30	46	38	48	76	238	246	516
28-48	34	12	32	42	68	188	266	546
48-61	33	60	62	71	92	318	296	386
61-68	38	72	78	88	130	406	349	245
68-80	60	102	100	96	176	534	361	105

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 15

Elioak loam 2 to 7 percent slopes, is located about 1 mile west-southwest of the intersection of Highways VA-604 and VA-674 and 0.4 mile southeast of the end of Highway VA-674.

Ap1--0 to 3 inches; dark brown (7.5YR 3/2) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; 2 percent rock fragments; neutral; clear smooth boundary.

Ap2--3 to 7 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; 7 percent rock fragments; neutral; clear smooth boundary.

Bt1--7 to 23 inches; yellowish red (5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky, plastic; common very fine and fine roots; thin patchy clay films on faces of peds; 3 percent rock fragments; strongly acid; gradual smooth boundary.

Bt2--23 to 54 inches; red (2.5YR 4/6) clay; many medium distinct yellowish red (5YR 5/8) and strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure; firm, sticky, plastic; thin continuous clay films on faces of peds; 2 percent rock fragments; very strongly acid; clear wavy boundary.

BCt--54 to 64 inches; variegated red (2.5YR 4/6), yellowish red (5YR 5/6), and strong brown (7.5YR 5/4) clay; moderate medium subangular blocky structure; firm, sticky, plastic; common fine discontinuous tubular pores between peds; thin patchy clay films on faces of peds and in pores; 1 percent rock fragments; very strongly acid; gradual wavy boundary.

Ct--64 to 86 inches; variegated red, brown, yellow, and white silty clay; massive; firm, sticky, plastic; few clay flows; 3 percent rock fragments; very strongly acid.

Table C: Chemical properties* for Elioak loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-3	1511	199	125	124	1.2	--
3-7	940	199	23	87	0.7	--
7-23	454	197	7	79	0.6	--
23-54	67	80	25	49	0.7	--
54-64	101	80	125	49	0.8	--
64-86	67	74	16	49	0.8	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	14	76	101	98	54	343	440	217
3-7	26	72	87	80	38	303	372	325
7-23	20	50	58	56	24	208	273	519
23-54	10	30	36	38	24	138	279	583
54-64	13	35	44	42	30	164	325	511
64-86	4	20	40	58	56	178	411	411

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 16

Elioak loam, 7 to 15 percent slopes, is located about 0.5 mile west of the intersection of Highways VA-622 and US-33 and 0.68 mile east of the intersection of Highways US-33 and VA-646.

Ap--0 to 8 inches; dark yellowish brown (10YR 4/4) loam; few fine distinct yellowish red (5YR 4/6) mottles; moderate fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bt1--8 to 28 inches; yellowish red (5YR 5/8) clay; moderate fine subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thin patchy clay films on faces of peds; 1 percent rock fragments; strongly acid; clear smooth boundary.

Bt2--28 to 61 inches; red (2.5YR 4/6) clay; common fine distinct strong brown (7.5YR 5/6), yellowish brown (10YR 5/8), and light yellowish brown (10YR 6/4) mottles; moderate fine subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; thin continuous clay films on faces of peds; 1 percent rock fragments; strongly acid; gradual smooth boundary.

Ct--61 to 88 inches; variegated red, brown, and yellow silty clay loam; massive; friable, slightly sticky, slightly plastic; few very fine roots; few clay flows; 1 percent rock fragments; strongly acid.

Table C: Chemical properties* for Elioak loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-8	235	72	2	36	--	--
8-28	219	163	2	43	--	--
28-61	118	118	3	56	--	--
61-88	84	58	5	43	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-8	27	88	142	113	56	426	351	223
8-28	7	26	41	40	18	132	306	562
28-61	1	4	18	32	18	73	424	503
61-88	2	8	28	52	40	130	570	300

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 17

Elioak sandy loam, in an area of Elioak loam, 2 to 7 percent slopes, is located about 0.15 mile east of the intersection of Highways US-33 and VA-610 and 1.25 miles east-southeast of the intersection of Highways US-29 and US-33.

Ap--0 to 8 inches; dark brown (7.5YR 4/4) sandy loam; weak medium granular structure; friable; common very fine and fine roots; 10 percent rock fragments; many fine flakes of mica; moderately acid; abrupt smooth boundary.

Bt1--8 to 29 inches; red (2.5YR 4/6) clay; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; common very fine and fine roots; thin continuous clay films on faces of peds; many fine flakes of mica; strongly acid; gradual smooth boundary.

Bt2--29 to 38 inches; red (2.5YR 4/6) sandy clay loam; few coarse distinct yellowish brown (10YR 5/8) mottles; weak very coarse platy structure parting to weak fine subangular blocky; firm, slightly sticky, slightly plastic; many thin continuous clay films on faces of peds; many fine flakes of mica; strongly acid; diffuse smooth boundary.

Ct1--38 to 50 inches; red (2.5YR 4/6) sandy clay loam; few coarse distinct yellowish brown (10YR 5/8) mottles; massive; friable, slightly sticky, slightly plastic; common thick clay flows; many fine flakes of mica; strongly acid; diffuse smooth boundary.

Ct2--50 to 65 inches; red (2.5YR 4/6) fine sandy loam; few coarse distinct yellowish brown (10YR 5/8) mottles; massive; friable; few thick clay flows; many fine flakes of mica; very strongly acid.

Table A: Chemical properties for Elioak sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-8	2.58	0.83	0.17	4.40	7.98	44.86
8-29	0.99	3.30	0.28	10.40	14.97	30.53
29-38	0.00	1.70	0.30	6.40	8.40	23.81
38-50	0.00	1.40	0.29	6.40	8.09	20.89
50-65	0.00	0.97	0.20	4.60	5.77	20.28

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Elioak sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-8	1.70	5.48	0.25	3.83	93.47
8-29	0.31	5.07	2.45	7.02	65.10
29-38	0.08	5.13	2.85	4.85	41.24
38-50	0.11	5.05	2.65	4.34	38.94
50-65	0.14	4.98	2.05	3.22	36.34

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Elioak sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-8	454	114	11	38	--	--
8-29	135	199	8	53	--	--
29-38	67	130	12	21	--	--
38-50	67	155	8	41	--	--
50-65	51	88	8	32	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Elioak sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-8	2	22	119	282	122	547	278	175
8-29	1	6	38	149	116	310	105	585
29-38	1	9	57	249	203	519	134	347
38-50	0	3	43	332	250	628	147	225
50-65	1	4	92	363	246	706	147	147

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Elioak sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
8-29	320	20	660	--	--	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Table F: Clay mineralogy* for Elioak sandy loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
8-29	150	50	--	500	50	250	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Elioak Series - Supplemental profile 18

Elioak clay loam, 7 to 15 percent slopes, is located about 0.4 mile east of the intersection of Highways VA-633 and VA-640 and 1.5 miles west of the intersection of Highways VA-633 and US-29.

Ap--0 to 5 inches; dark brown (7.5YR 3/4) clay loam; many medium distinct yellowish red (5YR 4/6) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; 2 percent rock fragments; few fine flakes of mica; slightly acid; clear smooth boundary.

Bt1--5 to 24 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky, plastic; common very fine roots; thick patchy clay films on faces of peds; common fine flakes of mica; strongly acid; gradual smooth boundary.

BC--24 to 38 inches; red (2.5YR 4/6) clay loam; common fine prominent olive (5Y 5/3) mottles; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; many fine flakes of mica; strongly acid; clear wavy boundary.

C--38 to 70 inches; variegated red (2.5YR 4/6), yellowish red 5YR 6/8), and olive (5Y 5/3) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica; very strongly acid.

Table C: Chemical properties* for Elioak clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-5	588	102	7	53	--	--
5-24	34	20	5	45	--	--
24-38	34	12	4	28	--	--
38-70	17	10	6	17	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Elioak Series - Supplemental profile 19

Elioak silt loam, in an area of Elioak loam, 7 to 15 percent slopes, is located about 0.5 mile south-southeast of the intersection of Highways VA-743 and VA-607 and 0.34 mile west of the intersection of Highways VA-606 and VA-607.

Ap--0 to 8 inches; yellowish red (5YR 4/6) silt loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; common fine flakes of mica; moderately acid; abrupt smooth boundary.

Bt1--8 to 23 inches; dark red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; many very fine and fine roots; thick continuous clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual smooth boundary.

Bt2--23 to 33 inches; dark red (2.5YR 3/6) clay; moderate coarse platy structure parting to moderate fine subangular blocky; firm, sticky, plastic; few very fine and fine roots; thick continuous clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual smooth boundary.

Bt3--33 to 45 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/6) and black (10YR 2/1) mottles; moderate very coarse platy structure parting to moderate medium subangular blocky; firm, sticky, plastic; few very fine and fine roots; thick patchy clay films on faces of peds; many fine flakes of mica; very strongly acid; clear wavy boundary.

Ct--45 to 65 inches; variegated red (2.5YR 4/6), strong brown (7.5YR 5/6), and black (10YR 2/1) sandy clay loam; massive; friable, slightly sticky, slightly plastic; thin patchy clay flows; many fine flakes of mica; very strongly acid.

Table A: Chemical properties for Elioak silt loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-8	5.30	1.70	0.13	5.20	12.33	57.83
8-23	1.90	1.80	0.20	12.00	15.90	24.53
23-33	0.20	0.80	0.24	11.60	12.84	9.66
33-45	0.10	0.55	0.26	11.00	11.91	7.64
45-65	0.02	0.47	0.21	9.20	9.90	7.07

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Elioak silt loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-8	3.36	5.81	0.15	7.28	97.94
8-23	1.39	4.86	1.45	5.35	72.90
23-33	1.01	4.78	2.85	4.09	30.32
33-45	1.05	4.73	2.95	3.86	23.58
45-65	1.09	4.71	2.85	3.55	19.72

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table D: Particle-size distribution* for Elioak silt loam

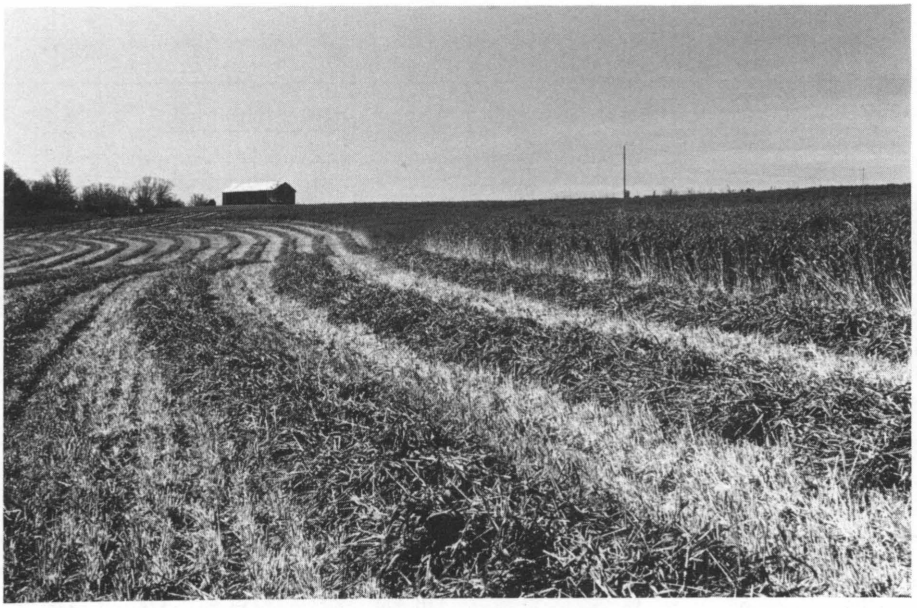
Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-8	8	14	38	116	82	258	324	418
8-23	2	8	26	84	62	182	190	628
23-33	2	8	32	104	70	216	176	608
33-45	2	14	52	148	92	308	244	448
45-65	0	18	74	200	132	424	268	308

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Elioak silt loam

Depth	HIV	MIC	VER	KAO	QTZ	MON	GIB	MISC
inches	g kg^{-1} of clay							
8-23	100	80	250	490	--	50	30	--
23-33	--	--	--	--	--	--	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.



Photograph 9: Small grain on Elioak clay loam, 7 to 15 percent slopes.

Elioak Series - Supplemental profile 20

Elioak clay loam, in an area of Elioak loam, 7 to 15 percent slopes, is located about 0.8 mile southwest of the intersection of Highways US-29 and US-33 and 1 mile south of the intersection of Highways VA-607 and US-29.

Ap--0 to 7 inches; dark reddish brown (5YR 3/4) clay loam; moderate very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; few fine flakes of mica; slighlty acid; clear smooth boundary.

Bt1--7 to 26 inches; reddish brown (5YR 4/4) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thin continuous clay films on faces of peds; common fine flakes of mica; strongly acid; clear wavy boundary.

Bt2--26 to 37 inches; yellowish red (5YR 4/6) sandy clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; thin patchy clay films on faces of peds; many fine flakes of mica; strongly acid; clear wavy boundary.

BC--37 to 47 inches; strong brown (7.5YR 4/6) sandy clay loam; weak medium and coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; many fine flakes of mica; strongly acid; abrupt wavy boundary.

C--47 to 73 inches; variegated in shades of red, yellow, brown, and black sandy loam; massive; friable; few very fine and fine roots; many fine flakes of mica; moderately acid.

Table D: Particle-size distribution* for Elioak clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-7	12	36	64	192	110	414	294	292
7-26	14	24	58	176	122	394	184	422
26-37	28	62	88	212	122	512	196	292
37-47	4	14	56	268	200	542	200	258
47-73	2	10	82	372	248	714	202	84

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Glenelg Series

Soils of the Glenelg series are very deep and well drained. These soils formed in materials weathered from mica schist, phyllite, and graywacke sandstone. They are on uplands in the Piedmont physiographic province. Slopes range from 7 to 25 percent.

A typical pedon of Glenelg loam, 7 to 15 percent slopes, is located about 1.5 miles west (276 degrees) of the intersection of Highways VA-608 and VA-633, 1.5 miles south-southwest (206 degrees) of the intersection of Highways VA-609 and US-33, and 1.6 miles west of Quinque.

Ap--0 to 5 inches; yellowish brown (10YR 5/4) loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common fine discontinuous tubular pores; common fine flakes of mica; strongly acid; clear smooth boundary.

Bt1--5 to 20 inches; strong brown (7.5YR 5/6) loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; common fine discontinuous tubular pores; thin patchy clay films on faces of peds; many fine flakes of mica; very strongly acid; clear wavy boundary.

Bt2--20 to 27 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; common fine discontinuous tubular pores and vesicular pores; thin very patchy clay films on faces of peds; many fine flakes of mica; strongly acid; clear wavy boundary.

C1--27 to 47 inches; mottled yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; common fine vesicular pores; 10 percent rock fragments; many fine flakes of mica; strongly acid; abrupt irregular boundary.

C2--47 to 62 inches; light yellowish brown (10YR 6/4) loam; massive; friable, slightly sticky, slightly plastic; common fine vesicular pores; 10 percent rock fragments; many fine flakes of mica; strongly acid.

Table A: Chemical properties for Glenelg loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-5	0.12	0.10	0.09	10.60	10.91	2.84
5-20	0.10	0.62	0.19	9.40	10.31	8.83
20-27	0.10	1.14	0.23	8.20	9.67	15.20
27-47	0.03	0.87	0.12	6.00	7.02	14.53
47-62	0.02	0.85	0.12	3.80	4.79	20.67

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Glenelg loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-5	13.9	4.12	2.25	2.56	12.11
5-20	8.6	4.41	3.15	4.06	22.41
20-27	7.5	4.72	2.75	4.22	34.83
27-47	9.0	4.73	2.05	3.07	33.22
47-62	9.7	4.92	1.55	2.54	38.98

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table D: Particle-size distribution* for Glenelg loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-5	2	6	26	261	200	495	358	147
5-20	1	4	10	134	169	318	409	273
20-27	1	3	6	82	272	364	428	208
27-47	0	3	5	103	395	506	407	87
47-62	1	3	6	94	102	206	756	38

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Glenelg loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
5-27	600	TR	360	10	10	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Table F: Clay mineralogy* for Glenelg loam

Depth	HIV	MIC	VER	KAO	QTZ	MON	GIB	MISC
inches	g kg^{-1} of clay							
5-27	--	400	--	200	100	--	--	

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Glenelg Series - Supplemental profile 1

Glenelg loam, 7 to 15 percent slopes, is located about 1 mile north-northwest of the intersection of Highways VA-604 and VA-605, and 1 mile south-southeast of the intersection of Highways VA-604 and VA-648.

0i--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 4 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; common fine flakes of mica; very strongly acid; clear wavy boundary.

Bt1--4 to 10 inches; strong brown (7.5YR 5/6) clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; thin very patchy clay films on faces of peds and in pores; 5 percent rock fragments; many fine flakes of mica; very strongly acid; clear smooth boundary.

Bt2--10 to 28 inches; strong brown (7.5YR 5/6) clay loam; common medium distinct yellowish red (5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; thin patchy clay films on faces of peds; 10 percent rock fragments; many fine flakes of mica; strongly acid; gradual smooth boundary.

C--28 to 33 inches; strong brown (7.5YR 5/6) silt loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; many fine flakes of mica; strongly acid; abrupt wavy boundary.

Cr--33 to 60 inches; variegated red, brown, yellow, and black slightly weathered bedrock that crushes under moderate pressure to silt loam; massive; firm, slightly sticky, slightly plastic; many fine flakes of mica; strongly acid.

Table A: Chemical properties for Glenelg loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-4	0.02	0.10	0.24	13.44	13.80	2.61
4-10	0.03	0.04	0.19	9.45	9.71	2.68
10-28	0.02	0.71	0.19	8.82	9.74	9.45
28-33	0.03	0.42	0.12	7.77	8.34	6.83
33-60	0.03	0.25	0.09	5.25	5.62	6.58

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Glenelg loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-4	--	4.84	4.05	4.41	8.16
4-10	--	4.79	3.65	3.91	6.65
10-28	--	5.27	3.95	4.87	18.89
28-33	--	5.28	4.35	4.92	11.59
33-60	--	5.36	3.45	3.82	9.69

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table D: Particle-size distribution* for Glenelg loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	10	46	62	104	108	330	408	262
4-10	8	26	44	76	84	238	410	352
10-28	8	26	58	86	74	252	356	392
28-33	26	54	32	64	86	262	526	212
33-60	48	88	48	68	102	354	534	112

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Glenelg loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
4-10	950	20	--	20	--	--	--
10-28	960	10	20	10	--	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Hatboro Series

Soils of the Hatboro series are very deep and poorly drained. These soils formed in recent alluvial materials weathered from crystalline rocks. They are on floodplains in the Piedmont physiographic province. Slopes range from 0 to 2 percent.

A typical pedon of Hatboro loam is located about 1.3 miles east (106 degrees) of the intersection of Highways US-33 and VA-609, 1.2 miles southwest (230 degrees) of the intersection of Highways VA-609 and VA-619, and 1.6 miles north of Quinque.

Ap--0 to 15 inches; brown (7.5YR 4/4) loam; weak fine granular structure; friable, slighlty sticky, slightly plastic; common very fine, fine, and medium roots; common fine discontinuous tubular pores; common fine flakes of mica; moderately acid; clear smooth boundary.

Bg1--15 to 26 inches; grayish brown (10YR 5/2) clay loam; common medium distinct strong brown (7.5YR 4/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; many fine discontinuous tubular pores and vesicular pores; few fine flakes of mica; moderately acid; abrupt smooth boundary.

Bg2--26 to 40 inches; mottled grayish brown (10YR 5/2), strong brown (7.5YR 4/6), and dark brown (7.5YR 3/2) sandy clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; many fine discontinuous tubular pores and vesicular pores; few fine flakes of mica; moderately acid; gradual smooth boundary.

2Cg1--40 to 45 inches; light brownish gray (2.5Y 6/2) loamy sand; common fine distinct strong brown (7.5YR 4/6) mottles; single grain; loose; few very fine and fine roots; common fine vesicular pores; common fine flakes of mica; moderately acid; clear wavy boundary.

2Cg2--45 to 60 inches; gray (N 5/) sandy loam; massive; very friable; common fine vesicular pores; common fine flakes of mica; moderately acid.

Table A: Chemical properties for Hatboro loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-15	3.22	0.55	0.12	8.00	11.89	32.72
15-26	3.15	0.81	0.12	16.20	20.28	20.12
26-40	1.68	0.49	0.06	8.00	10.23	21.80
40-45	0.65	0.24	0.04	3.20	4.13	22.52
45-60	1.16	0.42	0.07	5.00	6.65	24.81

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Hatboro loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-15	14.2	5.31	0.25	4.14	93.96
15-26	26.7	4.88	1.85	5.93	68.80
26-40	7.1	4.94	0.75	2.98	74.83
40-45	3.4	5.21	0.45	1.38	67.39
45-60	10.1	5.19	0.65	2.30	71.74

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Hatboro loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-15	504	43	8	14	--	8.7
15-26	408	53	9	17	--	6.2
26-40	312	47	7	6	--	8.5
40-45	120	18	12	6	--	1.6
45-60	204	38	9	17	--	4.8

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Hatboro loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-15	3	18	81	169	177	448	363	189
15-26	0	2	17	110	141	270	400	330
26-40	3	17	68	282	194	564	243	193
40-45	4	45	253	414	145	861	77	62
45-60	4	19	138	383	209	753	151	96

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Hatboro loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
15-40	540	360	70	10	10	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Hazel Series

Soils of the Hazel series are moderately deep and excessively drained. These soils formed in materials weathered from mica schist, phyllite, and graywacke sandstone. They are on uplands in the Piedmont physiographic province. Slopes range from 15 to 45 percent.

A typical pedon of Hazel loam, 15 to 25 percent slopes, is located about 1.1 miles south (200 degrees) of Swift Run Church at the intersection of Highways VA-623 and VA-633 and 1.8 miles southeast (134 degrees) of the intersection of Highways VA-604 and VA-633 at Amicus.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 3 inches; yellowish brown (10YR 5/4) loam; weak very fine and fine granular structure; very friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; few fine discontinuous tubular pores; 10 percent rock fragments; many fine flakes of mica; very strongly acid; clear smooth boundary.

Bw--3 to 14 inches; strong brown (7.5YR 5/6) silt loam; weak very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; few fine discontinuous tubular pores; 10 percent rock fragments; many fine flakes of mica; very strongly acid; clear irregular boundary.

Ct--14 to 27 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/6), and black (10YR 2/1) channery silt loam; a few pockets of silty clay loam soil material in rock joints; massive; friable, slightly sticky, slightly plastic; common very fine, fine, and medium and coarse roots; common fine vesicular pores; 30 percent rock fragments; many fine and medium flakes of mica; very strongly acid; gradual smooth boundary.

Cr--27 to 37 inches; mottled yellowish brown (10YR 5/6), yellowish red (5YR 5/6), and black (10YR 2/1) slightly weathered mica schist that under moderate pressure crushes to very channery silt loam; massive; firm; slightly sticky, slightly plastic; many fine and medium flakes of mica; very strongly acid; abrupt smooth boundary.

R--37 inches; hard mica schist bedrock.

Table A: Chemical properties for Hazel loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-3	0.58	0.23	0.25	17.60	18.66	5.68
3-14	0.04	0.07	0.10	8.00	8.21	2.56
14-27	0.06	0.66	0.06	5.80	6.58	11.85
27-37	0.03	0.42	0.05	3.60	4.10	12.20

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Hazel loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-3	60.0	4.50	3.45	4.51	23.50
3-14	12.4	4.45	2.55	2.76	7.61
14-27	0.3	4.76	1.55	2.33	33.48
27-37	0.0	5.01	1.35	1.85	27.03

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Hazel loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-3	96	13	9	36	--	16.1
3-14	36	7	7	17	--	4.0
14-27	36	47	8	14	--	5.4
27-37	36	42	7	15	--	5.6

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Hazel loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	11	41	58	125	146	381	457	162
3-14	23	44	60	110	179	416	446	138
14-27	18	46	47	98	224	433	464	103
27-37	21	59	60	91	248	479	473	48

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Hazel loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
3-27	760	TR	230	TR	TR	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Hazel Series - Supplemental profile 1

Hazel loam, 15 to 25 percent slopes, is located about 1.6 miles southeast of the intersection of Highways VA-619 and VA-609 and 0.5 mile south of the Dundee Farm entrance on Highway VA-619.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 4 inches; dark brown (7.5YR 4/4) loam; weak fine granular structure; very friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; 10 percent rock fragments; common fine flakes of mica; strongly acid; clear smooth boundary.

AB--4 to 8 inches; strong brown (7.5YR 4/6) silt loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; thin very patchy clay films on faces of peds; many fine flakes of mica; 5 percent rock fragments; strongly acid; clear smooth boundary.

Bt--8 to 13 inches; red (2.5YR 4/6) clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; thin patchy clay films on faces of peds; many fine flakes of mica; strongly acid; clear broken boundary.

Ct--13 to 39 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/6), and black (10YR 2/1) loam; massive; very friable, slightly sticky, slightly plastic; few very fine and fine roots; thin discontinuous clay flows in relic rock joints; many fine flakes of mica; strongly acid; clear irregular boundary.

Cr--39+ inches; variegated brown, red, and black slightly weathered mica schist.

Table D: Particle-size distribution* for Hazel loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	6	14	38	96	110	264	478	258
4-8	8	10	36	94	104	252	500	248
8-13	2	20	48	108	126	304	394	302
13-39	0	2	30	156	166	354	405	241

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Kinkora Series

Soils of the Kinkora series are very deep and poorly drained. These soils formed in alluvial materials weathered from crystalline rocks. They are in floodbasins in the Piedmont physiographic province. Slopes range from 0 to 2 percent.

A typical pedon of Kinkora silt loam is located about 1.1 miles east (96 degrees) of the intersection of Highways VA-230 and VA-619, 0.8 mile east-southeast (123 degrees) of the intersection of Highways VA-230 and VA-667, and 3 miles northeast of Stanardsville.

Ap--0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; few fine discontinuous tubular pores; 2 percent coarse fragments; few fine flakes of mica; moderately acid; gradual smooth boundary.

Eg--9 to 16 inches; grayish brown (10YR 5/2) silty clay loam; few medium distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; few fine discontinuous tubular pores and vesicular pores; few fine flakes of mica; strongly acid; clear smooth boundary.

Btg1--16 to 29 inches; light brownish gray (10YR 6/2) silty clay loam; common coarse distinct strong brown (7.5YR 5/6) mottles; moderate medium and coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine discontinuous tubular pores and vesicular pores; thin patchy clay films on faces of peds; 2 percent coarse fragments; few fine flakes of mica; strongly acid; clear wavy boundary.

Btg2--29 to 39 inches; gray (10YR 6/1) clay; many coarse distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; few fine roots; common fine discontinuous tubular pores and vesicular pores; thin very patchy clay films on faces of peds; 2 percent coarse fragments; common fine flakes of mica; very strongly acid; clear smooth boundary.

2Cg--39 to 60 inches; light gray (10YR 6/1) cobbly sandy clay; massive; firm, sticky, plastic; 25 percent coarse fragments; common fine flakes of mica; strongly acid.

Table A: Chemical properties for Kinkora silt loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-9	5.30	2.20	0.28	7.60	15.38	50.59
9-16	4.10	1.13	0.11	8.00	13.34	40.03
16-29	3.72	0.95	0.05	5.80	10.52	44.87
29-39	4.49	1.59	0.08	11.60	17.76	34.68
39-43	2.69	2.00	0.11	5.60	10.40	46.15
43-60	2.65	1.22	0.11	3.00	6.98	57.02

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Kinkora silt loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-9	22.4	5.57	0.05	7.83	99.36
9-16	16.9	4.94	0.55	5.89	90.66
16-29	7.9	4.69	1.25	5.97	79.06
29-39	2.4	4.63	1.65	7.81	78.87
39-43	5.5	4.71	1.65	6.45	74.42
43-60	5.9	5.05	0.45	4.43	89.84

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Kinkora silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-9	960	120	22	64	--	12.3
9-16	636	93	11	18	--	6.1
16-29	516	74	9	8	--	2.6
29-39	552	119	9	11	--	5.0
39-43	540	120	15	17	--	4.8
43-60	612	120	54	20	--	5.5

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Kinkora silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-9	10	27	50	67	62	216	521	263
9-16	5	15	30	49	63	162	562	276
16-29	9	14	28	38	63	152	518	330
29-39	10	21	38	47	50	166	438	396
39-43	31	31	50	64	67	243	459	298
43-60	121	183	171	105	46	626	225	149

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Kinkora silt loam

Depth	HIV	MIC	VER	KAO	QTZ	MON	GIB	MISC#
inches	g kg^{-1} of clay							
16-39	50	100	150	440	50	50	TR	160

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.
#Interstratified mica/vermiculite.

Photograph 10: Corn and hay on Kinkora silt loam.

Kinkora Series - Supplemental profile 1

Kinkora silty clay loam, in an area of Kinkora silt loam, 0 to 2 percent slopes, is located about 0.5 mile south of the intersection of Highways VA-604 and VA-674 and 0.75 mile southwest of the intersection of Highways VA-622 and VA-624.

Ap--0 to 10 inches; dark brown (10YR 4/3) silty clay loam; common medium distinct gray (10YR 5/1) mottles; moderate fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; common fine discontinuous tubular pores between peds; slightly acid; abrupt smooth boundary.

Btg1--10 to 21 inches; gray (10YR 6/1) silty clay loam; common fine distinct strong brown (7.5YR 5/8) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; thin patchy clay films on faces of peds; 5 percent rock fragments; very strongly acid; clear wavy boundary.

2Btg2--21 to 28 inches; gray (10YR 5/1) sandy clay loam; common medium and coarse distinct strong brown (7.5YR 5/8) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; thin very patchy clay films on faces of peds; 10 percent rock fragments; common fine flakes of mica; strongly acid; clear smooth boundary.

3Btg3--28 to 47 inches; gray (10YR 5/1) clay; many medium distinct strong brown (7.5YR 5/8) and yellowish red (5YR 5/6) mottles; weak fine and medium subangular blocky structure; firm, sticky, plastic; thin patchy clay films on faces of peds; 10 percent rock fragments; strongly acid; abrupt smooth boundary.

3C--47 to 60 inches; mottled gray (10YR 5/1) strong brown (7.5YR 5/8), and yellowish red (5YR 5/6) very gravelly clay; massive; firm, sticky, plastic; 45 percent rock fragments; moderately acid.

Table C: Chemical properties* for Kinkora silty clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-10	480	60	7	16	--	16.1
10-21	210	43	4	6	--	2.4
21-28	186	48	5	6	--	2.3
28-34	282	60	4	6	--	1.3
34-47	360	60	4	7	--	1.2
47-60	390	60	7	9	--	4.6

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Kinkora silty clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-10	16	42	42	52	46	198	438	364
10-21	14	42	40	40	40	176	460	364
21-28	54	152	140	122	62	530	206	264
28-34	34	64	72	84	56	310	266	424
34-47	20	52	66	88	56	282	294	424
47-60	24	48	56	66	44	238	278	484

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Lew Series

Soils of the Lew series are very deep and well drained. These soils formed in colluvial materials weathered from metabasalts and associated metavolcanic and metasedimentary rocks. They are on alluvial fans, along drainageways, in saddles, and in concave heads of drainageways in the Blue Ridge physiographic province. Slopes range from 7 to 75 percent.

A typical pedon of Lew very channery loam, in an area of Lew extremely stony loam, 25 to 75 percent slopes, is located about 2 miles west (284 degrees) of the intersection of Highways VA-632 and VA-627 at Mountain Grove Chapel in Bacon Hollow and 0.7 mile east (94 degrees) of the intersection of Skyline Drive and the Greene and Rockingham County lines at Simmons Gap.

Oi--2 to 0 inches; partially decomposed leaves and twigs.

A--0 to 4 inches; very dark grayish brown (10YR 3/2) very channery loam; weak very fine and fine granular structure; very friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; many fine discontinuous tubular pores; 45 percent rock fragments; strongly acid; clear smooth boundary.

E--4 to 13 inches; dark yellowish brown (10YR 4/4) very channery silt loam; moderate fine and medium granular structure; very friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; many fine discontinuous tubular pores; 45 percent rock fragments; strongly acid; gradual smooth boundary.

Bt1--13 to 33 inches; dark yellowish brown (10YR 4/4) very channery clay loam; moderate very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; many fine discontinuous tubular pores; many medium patchy clay films on faces of peds and rock fragments; 45 percent rock fragments; strongly acid; diffuse smooth boundary.

Bt2--33 to 53 inches; yellowish brown (10YR 5/6) very channery clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; many fine discontinuous tubular pores; many medium patchy clay films on faces of peds and rock fragments; 50 percent rock fragments; very strongly acid; diffuse smooth boundary.

Bt3--53 to 67 inches; mottled yellowish brown (10YR 5/4) and yellowish red (5YR 4/6) very channery clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; many fine discontinuous tubular pores; many medium patchy clay films on faces of peds and rock fragments; 55 percent rock fragments; strongly acid; abrupt smooth boundary.

2Bt4--67 to 72 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 4/6), and black (10YR 2/1) channery clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine discontinuous tubular pores; many patchy clay films on faces of peds and rock fragments; 40 percent rock fragments; strongly acid.

Table A: Chemical properties for Lew very channery loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-4	3.76	0.97	0.28	28.00	33.01	15.18
4-13	0.12	0.11	0.07	13.20	13.50	2.22
13-33	0.48	0.80	0.04	14.40	15.72	8.40
33-53	1.09	1.12	0.05	14.40	16.66	13.57
53-67	2.42	1.08	0.06	12.20	15.76	22.59
67-72	10.40	5.00	0.16	13.20	28.76	54.10

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Lew very channery loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-4	105.6	4.05	1.75	6.76	74.11
4-13	26.6	4.43	2.25	2.55	11.76
13-33	9.4	4.64	3.05	4.37	30.21
33-53	4.8	4.82	3.55	5.81	38.90
53-67	0.8	5.12	1.15	4.71	75.58
67-72	2.8	5.18	2.65	18.21	85.45

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Lew very channery loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-4	621	107	15	34	--	--
4-13	51	12	10	10	--	--
13-33	118	74	18	8	--	--
33-53	135	84	18	10	--	--
53-67	302	100	12	15	--	--
67-72	1192	199	14	21	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Lew very channery loam

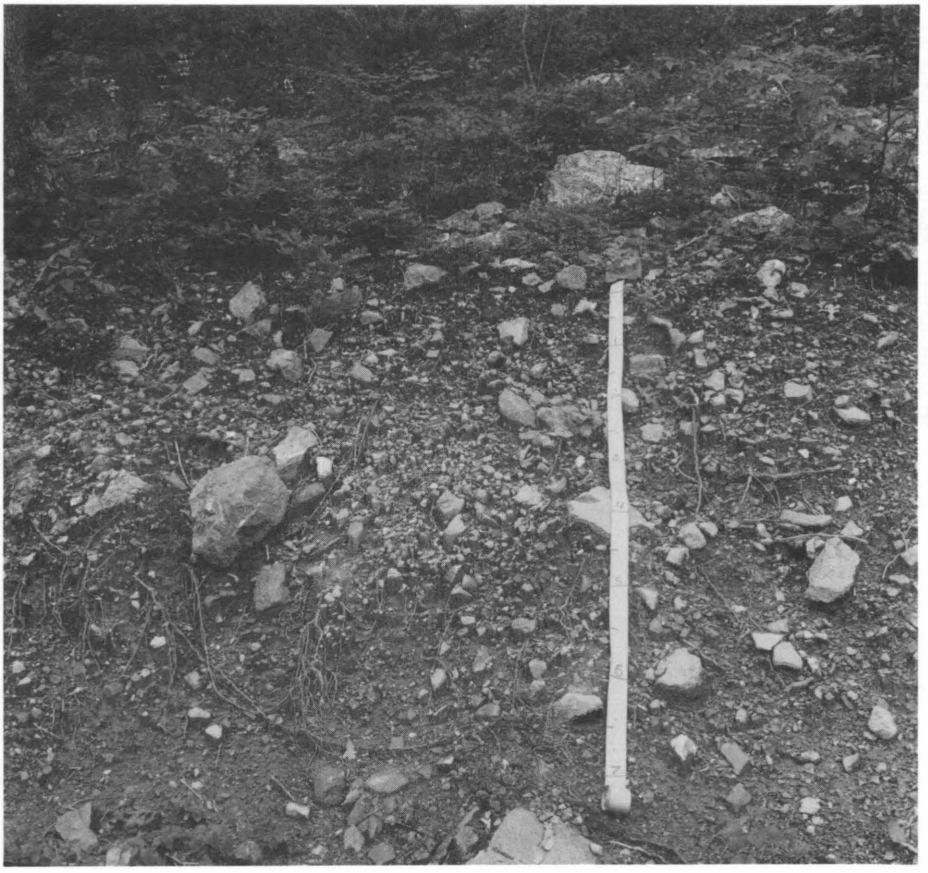
Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	65	35	43	64	49	256	478	266
4-13	45	38	37	57	37	214	521	265
13-33	60	33	34	73	28	228	493	279
33-53	45	40	87	54	24	250	485	265
53-67	63	56	85	119	106	429	405	166
67-72	22	36	33	69	84	244	489	267

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Lew very channery loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
13-33	270	80	470	--	180	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.



Photograph 11: Profile of Lew extremely stony loam, 15 to 25 percent slopes.

Lew Series - Supplemental profile 1

Lew channery clay loam, in an area of Lew extremely stony loam, 25 to 75 percent slopes, is located about 1.2 miles southwest of the intersection of Highways VA-627 and VA-632 at Mountain Grove Chapel and 0.7 mile northwest of Wyatt Mountain Church.

Ap--0 to 8 inches; dark reddish brown (5YR 3/4) channery clay loam; moderate very fine and fine granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; 16 percent rock fragments; strongly acid; clear smooth boundary.

Bt1--8 to 28 inches; yellowish red (5YR 4/6) very channery clay; moderate fine subangular blocky structure; friable, sticky, plastic; common very fine and fine roots; thin patchy clay films on faces of peds; 45 percent rock fragments; strongly acid; diffuse smooth boundary.

Bt2--28 to 41 inches; strong brown (7.5YR 4/6) very channery clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; thin patchy clay films on faces of peds; 37 percent rock fragments; strongly acid; diffuse smooth boundary.

Bt3--41 to 54 inches; brown (7.5YR 4/4) very channery clay loam; many medium distinct brownish yellow (10YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; thin patchy clay films on faces of peds; 37 percent rock fragments; strongly acid; diffuse smooth boundary.

Bt4--54 to 64 inches; strong brown (7.5YR 4/6) very channery clay loam; many medium distinct reddish yellow (7.5YR 6/8) mottles; moderate very fine subangular blocky structure; friable, slightly sticky, slightly plastic; thin patchy clay films on faces of peds; 40 percent rock fragments; very strongly acid.

Table C: Chemical properties* for Lew channery clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-8	269	44	6	46	--	--
8-28	521	92	6	32	--	--
28-41	470	124	5	19	--	--
41-54	24	26	3	13	--	--
54-64	370	124	5	15	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Lew channery clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-8	54	56	54	80	72	316	349	335
8-28	52	64	56	70	60	302	253	445
28-41	64	62	52	74	70	322	273	405
41-54	48	70	66	76	72	332	271	397
54-64	76	100	94	98	74	442	224	334

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Lew Series - Supplemental profile 2

Lew channery loam, in an area of Lew extremely stony loam, 25 to 75 percent slopes, is located about 0.7 mile east of the Simmons Gap Ranger Station and 0.2 mile southwest of an old homestead on the west side of Flattop Mountain.

A--0 to 4 inches; very dark grayish brown (10YR 3/2) channery loam; weak very fine and fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; 25 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1--4 to 15 inches; yellowish brown (10YR 5/4) very channery clay; moderate very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; thin patchy clay films on faces of peds; 40 percent rock fragments; very strongly acid; clear smooth boundary.

Bt2--15 to 26 inches; yellowish brown (10YR 5/4) channery sandy clay loam; moderate very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; thin patchy clay films on faces of peds; 35 percent rock fragments; strongly acid; gradual wavy boundary.

Ab--26 to 51 inches; dark brown (10YR 3/3) very channery sandy loam; moderate very fine and fine subangular blocky structure; friable; few very fine, fine, and medium roots; thin patchy clay films on faces of peds; 50 percent rock fragments; moderately acid; clear wavy boundary.

Btb--51 to 65 inches; yellowish brown (10YR 5/4) very channery loam; weak very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; thin patchy clay films on faces of peds; 35 percent rock fragments; slightly acid.

Table C: Chemical properties* for Lew channery loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	101	34	3	32	--	--
4-15	101	42	5	20	--	--
15-26	370	148	8	16	--	--
26-51	621	199	22	26	--	--
51-65	1578	199	19	34	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Lew channery loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	112	88	66	76	40	382	364	254
4-15	72	64	50	70	54	310	286	404
15-26	108	104	88	112	74	486	240	274
26-51	146	122	102	140	96	606	210	184
51-65	76	80	74	106	78	414	336	250

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Lew Series - Supplemental profile 3

Lew very channery loam, in an area of Lew extremely stony loam, 25 to 75 percent slopes, is located about 1.8 miles northwest of the intersection of Highways VA-630 and VA-631 and 1.9 miles north-northwest of the intersection of Highways VA-630 and VA-626.

A--0 to 4 inches; dark brown (10YR 4/3) very channery loam; moderate very fine and fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; 50 percent rock fragments; strongly acid; clear irregular boundary.

Bt1--4 to 24 inches; strong brown (7.5YR 4/6) very channery clay loam; common medium fine dark brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; thin patchy clay films on faces of peds; 45 percent rock fragments; moderately acid; gradual wavy boundary.

Bt2--24 to 54 inches; strong brown (7.5YR 5/6) very channery sandy clay loam; many coarse distinct dark yellowish brown (10YR 3/4) and common fine faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; thin patchy clay films on faces of peds; 60 percent rock fragments; moderately acid; clear wavy boundary.

BCt--54 to 79 inches; dark yellowish brown (10YR 4/4) very channery sandy loam; few fine distinct black (10YR 2/1) and strong brown (7.5YR 4/6) mottles; weak fine subangular blocky structure; very friable; common very fine, fine, and medium roots; thin patchy clay flows in root channels; 45 percent rock fragments; moderately acid.

Table C: Chemical properties* for Lew very channery loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	219	72	21	47	--	--
4-24	873	199	6	54	--	--
24-54	1545	199	11	30	--	--
54-79	1629	199	23	26	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Lew very channery loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-4	76	110	102	92	48	428	348	224
4-24	84	104	90	78	44	400	326	274
24-54	182	154	88	64	28	516	244	240
54-79	120	164	144	124	58	610	210	180

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Meadowville Series

Soils of the Meadowville series are deep and very deep well drained soils formed in local alluvium and colluvium weathered from crystalline rocks. They are along small drainageways and on footslopes in the Piedmont Physiographic Province. Slopes range from 2 to 7 percent.

A typical pedon of Meadowville fine sandy loam, 2 to 7 percent slopes, is located 0.4 miles east (90 degrees) of the junction of Highways VA-607 and VA-743, 0.4 mile south-southeast (155 degrees) of the intersection of Highways VA-606 and VA-607 and 2 miles south-southwest of Ruckersville.

Ap--0 to 7 inches; dark brown (7.5YR 4/4) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; common fine discontinuous tubular pores; common fine flakes of mica; very strongly acid; clear wavy boundary.

Bt1--7 to 21 inches; reddish brown (5YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; common fine discontinuous tubular pores; thin very patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2--21 to 33 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; common fine discontinuous tubular pores; thin very patchy clay films on faces of peds; many fine flakes of mica; strongly acid; abrupt smooth boundary.

Bt3--33 to 41 inches; yellowish red (5YR 4/6) sandy clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak thick platy structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; few fine roots; common fine vesicular pores; thin very patchy clay films on faces of peds; many fine flakes of mica; strongly acid; gradual smooth boundary.

2C--41 to 72 inches; yellowish red (5YR 5/6) sandy clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; massive; friable, slightly sticky, slightly plastic; few fine roots; common fine vesicular pores; many fine and medium flakes of mica; moderately acid.

Table A: Chemical properties for Meadowville fine sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-7	0.19	0.14	0.18	11.34	11.85	4.30
7-21	2.67	1.25	0.27	11.13	15.32	27.35
21-33	2.61	1.90	0.22	11.55	16.28	29.05
33-41	0.81	1.28	0.22	10.71	13.02	17.74
41-72	0.05	0.89	0.40	10.71	12.05	11.12

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Meadowville fine sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-7	--	4.60	2.55	3.06	16.67
7-21	--	5.16	0.85	5.04	83.13
21-33	--	5.40	0.75	5.48	86.31
33-41	--	5.55	1.75	4.06	56.90
41-72	--	5.60	2.75	4.09	32.76

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Meadowville fine sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-7	96	19	3	40	--	16.1
7-21	384	102	3	47	--	16.1
21-33	336	120	3	34	--	5.8
33-41	144	97	3	47	--	5.7
41-72	60	73	3	80	--	5.7

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Meadowville fine sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-7	14	29	89	333	194	659	210	131
7-21	7	14	50	156	139	366	344	290
21-33	7	11	24	138	192	372	269	359
33-41	14	31	61	235	215	556	157	287
41-72	16	32	105	258	178	589	131	280

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Meadowville fine sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
7-41	40	310	630	TR	TR	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Photograph 12: Hay on Meadowville fine sandy loam, 2 to 7 percent slopes.

Meadowville Series - Supplemental profile 1

Meadowville clay loam, in an area of Meadowville fine sandy loam, rarely flooded, 2 to 7 percent slopes, is located about 0.9 mile east of the intersection of Highways VA-609 and US-33 and 0.8 mile northwest of the intersection of Highways VA-633 and VA-640.

Ap--0 to 4 inches; strong brown (7.5YR 5/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; 2 percent rock fragments; very strongly acid; clear wavy boundary.

Bt1--4 to 13 inches; yellowish red (5YR 4/8) clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; thin very patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2--13 to 28 inches; yellowish red (5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few fine medium and coarse roots; thin patchy clay films on faces of peds; strongly acid; clear smooth boundary.

2Bt3--28 to 35 inches; red (2.5YR 4/6) clay loam; weak medium platy structure parting to moderate very fine subangular blocky; friable, slightly sticky, slightly plastic; few fine and medium roots; thin patchy clay films on faces of peds; 10 percent rock fragments; strongly acid; clear smooth boundary.

2Bt4--34 to 40 inches; red (2.5YR 4/6) clay; common fine distinct strong brown (7.5YR 5/6) mottles; weak coarse platy structure parting to weak fine subangular blocky; friable, sticky, slightly plastic; few fine roots; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

2Bt5--40 to 50 inches; red (2.5YR 4/6) clay loam; common fine distinct reddish yellow (5YR 6/6) mottles; weak coarse platy structure parting to moderate fine subangular blocky; friable, slightly sticky, slightly plastic; few fine roots; thin patchy clay films on faces of peds; strongly acid; clear wavy boundary.

2C--50 to 65 inches; sandy clay loam mottled red and brown; massive; friable, slightly sticky; strongly acid.

Table D: Particle-size distribution* for Meadowville clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-10	13	39	98	154	79	383	268	349
10-33	12	34	86	145	76	353	238	409
33-71	9	24	50	95	69	247	212	541
71-89	20	36	63	159	157	435	172	393
89-109	19	32	48	109	149	357	189	454
109-127	20	30	51	124	162	387	200	413
127-165	21	34	56	145	197	453	219	328

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Meadowville Series - Supplemental profile 2

Meadowville loam, in an area of Meadowville fine sandy loam, rarely flooded, 2 to 7 percent slopes, is located about 0.3 mile south-southwest of the intersection of Highways VA-607 and VA-606 and 0.7 mile west-southwest of the intersection of Highways VA-607 and US-29.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

A--0 to 3 inches; dark reddish brown (5YR 3/2) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; moderately acid; clear smooth boundary.

Bt1--3 to 9 inches; reddish brown (5YR 4/4) clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; thin very patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2--9 to 25 inches; reddish brown (5YR 4/4) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few very fine, fine and common coarse roots; thin patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt3--25 to 34 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; thin patchy clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt4--34 to 51 inches; red (2.5YR 4/6) clay; few fine distinct strong brown (7.5YR 5/6) and prominent black (10YR 2/1) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; thin patchy clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt5--51 to 60 inches; mottled yellowish brown (10YR 5/4), reddish brown (5YR 4/4), and pale brown (10YR 6/3) clay; weak moderate subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; thin very patchy clay films on faces of peds; moderately acid; clear smooth boundary.

C--60 to 72 inches; mottled gray, brown, red, and white sandy clay loam; massive; friable, slightly sticky, slightly plastic; strongly acid.

Table C: Chemical properties* for Meadowville loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-3	924	166	2	69	--	--
3-9	217	96	1	75	--	--
9-25	420	140	2	65	--	--
25-34	560	126	2	58	--	--
34-51	448	163	4	73	--	--
51-60	336	146	0	52	--	--
60-72	196	118	1	45	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Meadowville loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	22	34	90	182	120	448	343	209
3-9	6	16	46	146	110	324	336	340
9-25	10	16	34	124	100	284	267	449
25-34	18	20	40	148	120	346	175	479
34-51	14	20	40	132	132	338	192	470
51-60	2	13	48	162	138	363	164	473
60-72	34	57	93	276	202	662	118	220

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Meadowville Series - Supplemental profile 3

Meadowville sandy clay loam, in an area of Meadowville fine sandy loam, rarely flooded, 2 to 7 percent slopes, is located about 1.2 miles southwest of the intersection of Highways VA-633 and US-33 and 0.8 mile south-southwest of the intersection of Highways VA-633 and VA-617.

Ap--0 to 9 inches; dark brown (7.5YR 4/4) sandy clay loam; weak fine granular structure; friable, slightly sticky; common very fine roots; common fine flakes of mica; slightly acid; clear smooth boundary.

Bt1--9 to 23 inches; reddish brown (5YR 4/4) clay; few fine faint yellowish red (5YR 5/6) mottles in upper part; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; thin very patchy clay films on faces of peds; few fine flakes of mica; moderately acid; clear smooth boundary.

Bt2--23 to 42 inches; red (2.5YR 4/6) clay loam; common fine faint yellowish red (5YR 4/6) and few fine distinct light yellowish brown (10YR 6/4) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; thin very patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC--42 to 68 inches; mottled red (2.5YR 5/8), light yellowish brown (10YR 6/4), light brownish gray (2.5Y 6/2), and yellowish red (5YR 4/6) clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine flakes of mica; strongly acid.

Table C: Chemical properties* for Meadowville sandy clay loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-9	770	196	2	41	--	--
9-15	350	140	0	18	--	--
15-23	280	101	3	15	--	--
23-42	168	91	6	24	--	--
42-68	217	158	8	40	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Meadowville sandy clay loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-9	26	26	88	236	111	487	193	320
9-15	14	21	66	172	96	369	229	402
15-23	22	23	70	185	96	396	194	410
23-42	16	26	72	190	104	408	192	400
42-68	18	22	60	176	94	370	230	400

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Meadowville Series - Supplemental profile 4

Meadowville loam, in an area of Meadowville fine sandy loam, rarely flooded, 2 ot 7 percent slopes, is located about 0.8 mile east of the intersection of Highways VA-609 and US-33 and 0.3 mile east-northeast of the intersection of Highways VA-672 and VA-609.

Ap--0 to 4 inches; dark yellowish brown (10YR 4/4) loam; weak very fine and fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

Bt1--4 to 8 inches; strong brown (7.5YR 4/4) clay loam; weak very fine subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; thin very patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2--8 to 22 inches; yellowish red (5YR 4/6) clay; moderate very fine subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thick patchy clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual smooth boundary.

Bt3--22 to 30 inches; yellowish red (5YR 4/6) clay; moderate very fine and fine subangular blocky structure; friable, sticky, plastic; many very fine, fine, and medium roots; thick patchy clay films on faces of peds; many fine flakes of mica; strongly acid; gradual wavy boundary.

Bt4--30 to 34 inches; yellowish red (5YR 5/6) clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable, sticky, plastic; common very fine and fine roots; thick patchy clay films on faces of peds; many fine flakes of mica; strongly acid; clear smooth boundary.

Bt5--34 to 41 inches; strong brown (7.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium platy structure parting to weak very fine subangular blocky; friable, sticky, plastic; few very fine roots; thick patchy clay films on faces of peds; common fine flakes of mica; strongly acid; abrupt smooth boundary.

Bt6--41 to 61 inches; yellowish brown (10YR 5/4) clay; common fine prominent yellowish red (5YR 5/8) mottles; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; common fine flakes of mica; strongly acid.

Table C: Chemical properties* for Meadowville loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	48	29	7	40	--	14.0
4-8	36	41	5	28	--	5.8
8-22	36	105	5	48	--	1.7
22-30	36	61	5	36	--	0.3
30-34	36	54	5	28	--	1.1
34-41	24	44	8	20	--	3.7
41-61	24	59	5	26	--	0.4

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Meadowville loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	18	38	106	188	92	442	322	236
4-8	14	30	92	176	88	400	244	356
8-22	20	32	76	134	68	330	184	486
22-30	8	20	70	162	110	370	214	416
30-34	6	14	46	104	86	256	298	446
34-41	12	30	100	164	94	400	194	406
41-61	2	8	38	82	60	190	326	484

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Myersville Series

Soils of the Myersville series are very deep and well drained. These soils formed in materials weathered from metabasalts and associated metavolcanic and metasedimentary rocks. They are on uplands in the Blue Ridge physiographic province. Slopes range from 7 to 80 percent.

A typical pedon of Myersville channery silt loam, in an area of Myersville and Catoctin very stony silt loam, 7 to 15 percent slopes, is located about 0.9 mile southeast (128 degrees) of the intersection of the Skyline Drive and the Greene and Rockingham County lines at Smith Roach Gap and 2 miles north-northeast (20 degrees) of the intersection of Highways VA-632 and VA-627 at Mountain Grove Chapel in Bacon Hollow.

A--0 to 5 inches; dark brown (10YR 3/3) channery silt loam; moderate fine granular structure; very friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; many fine discontinuous tubular pores; 20 percent rock fragments; moderately acid; clear wavy boundary.

Bt1--5 to 10 inches; strong brown (7.5YR 4/6) channery silty clay loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; moderate very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; many fine discontinuous tubular pores; common medium patchy clay films on faces of peds; 20 percent rock fragments; moderately acid; clear wavy boundary.

Bt2--10 to 21 inches; strong brown (7.5YR 4/6) channery silt loam; moderate very fine and fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; many fine discontinuous tubular pores; many medium patchy clay films and black coatings on faces of peds; 20 percent rock fragments; moderately acid; gradual smooth boundary.

Bt3--21 to 30 inches; strong brown (7.5YR 5/6) channery silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; many fine discontinuous tubular pores; many medium patchy clay films and black coatings on faces of peds; 30 percent rock fragments; strongly acid; clear smooth boundary.

Ct--30 to 44 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), black (10YR 2/1), and pale olive (5Y 6/3) extremely channery silty clay loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; common fine vesicular pores; common thick clay flows in relic rock joints; 70 percent rock fragments; moderately acid; abrupt smooth boundary.

Crt--44 to 72 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), black (10YR 2/1), and pale olive (5Y 6/3) slightly weathered bedrock that crushes under moderate pressure to extremely channery silty clay loam; massive; very firm, slightly sticky, slightly plastic; common thick clay flows in relic rock joints; 70 percent rock fragments; moderately acid; abrupt smooth boundary.

R--72 inches; hard greenstone bedrock.

Table A: Chemical properties for Myersville channery silt loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-5	2.50	0.78	0.16	16.00	19.44	17.70
5-10	4.72	1.02	0.04	10.40	16.18	35.72
10-21	4.80	1.80	0.03	11.40	18.03	36.77
21-30	7.80	4.30	0.04	15.40	27.54	44.08
30-44	15.90	7.70	0.05	12.80	36.45	64.88
44-72	22.00	9.50	0.05	11.00	42.55	74.15

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Myersville channery silt loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-5	34.2	4.79	1.75	5.19	66.28
5-10	12.4	5.12	1.35	7.13	81.07
10-21	5.7	4.98	2.55	9.18	72.22
21-30	3.5	4.97	3.05	15.19	79.92
30-44	1.8	5.10	2.35	26.00	90.96
44-72	2.1	5.32	2.05	33.60	93.90

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Myersville channery silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-5	204	82	9	17	--	--
5-10	386	64	8	10	--	--
10-21	621	128	7	8	--	--
21-30	621	199	7	8	--	--
30-44	1125	199	8	7	--	--
44-72	1679	199	7	8	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Myersville channery silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-5	93	52	26	26	16	213	513	274
5-10	72	50	25	27	33	207	502	291
10-21	78	55	27	43	26	229	506	265
21-30	31	31	18	18	30	128	583	289
30-44	26	29	17	18	30	120	561	319
44-72	17	37	23	25	43	145	552	303

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Myersville channery silt loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
5-30	160	70	460	--	310	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Photograph 13: Summer cottage on Myersville and Catoctin extremely stony silt loams, 15 to 25 percent slopes.

Parker Series

Soils of the Parker series are deep and very deep and somewhat excessively drained. These soils formed in materials weathered from granodiorite, granite, and granite gneiss. They are on uplands in the Blue Ridge physiographic province. Slopes range from 7 to 70 percent.

A typical pedon of Parker very gravelly loam, in an area of Chester and Parker soils, very stony, 7 to 15 percent slopes, is located about 1.7 miles east (78 degrees) of South River Overlook on the Skyline Drive, 2 miles northwest (317 degrees) of the intersection of Highways VA-642 and VA-643, and 3 miles west of Fletcher.

Oi--2 to 0 inches; partially decomposed leaves and twigs.

A--0 to 3 inches; very dark grayish brown (10YR 3/2) very gravelly loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; common fine discontinuous tubular pores; 40 percent rock fragments; very strongly acid; clear smooth boundary.

E--3 to 6 inches; dark yellowish brown (10YR 4/4) very gravelly loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; common fine discontinuous tubular pores; 40 percent rock fragments; very strongly acid; clear wavy boundary.

Bw--6 to 25 inches; brownish yellow (10YR 6/6) very gravelly loam; weak fine subangular blocky structure parting to weak fine granular; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common fine discontinuous tubular pores; 50 percent rock fragments; very strongly acid; clear wavy boundary.

Crt--25 to 60 inches; brownish yellow (10YR 6/6) slightly weathered granodiorite rock that crushes under moderate pressure to extremely cobbly sandy loam; very firm; few thick clay flows in rock joints; 80 percent rock fragments; strongly acid.

Table A: Chemical properties for Parker very gravelly loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-3	0.40	0.23	0.40	36.60	37.63	2.74
3-6	0.07	0.07	0.31	24.00	24.45	1.84
6-20	0.12	0.24	0.35	17.40	18.11	3.92
20-25	0.11	0.18	0.23	14.40	14.92	3.49
25-60	--	--	--	--	--	--

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Parker very gravelly loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-3	7.5	4.29	6.55	7.58	13.59
3-6	3.0	4.49	4.45	4.90	9.18
6-20	1.5	4.48	4.05	4.76	14.92
20-25	0.7	4.54	1.85	2.37	21.94
25-60	--	--	--	--	--

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Parker very gravelly loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-3	48	11	13	48	--	2.2
3-6	36	6	15	39	--	1.2
6-20	36	12	3	58	--	0.4
20-25	36	14	5	53	--	1.1
25-60	--	--	--	--	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Parker very gravelly loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	79	93	89	66	41	368	377	255
3-6	53	80	80	80	58	351	399	250
6-20	80	94	81	79	60	394	379	227
20-25	112	149	146	132	91	630	238	132
25-60	--	--	--	--	--	--	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Parker very gravelly loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
6-25	310	240	50	20	TR	380	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Parker Series - Supplemental profile 1

Parker very gravelly silt loam, in an area of Chester and Parker soils, very stony, 7 to 15 percent slopes, is located about 1.7 miles east of South River Overlook along the Skyline Drive and 2.1 miles northwest of the intersection of Highways VA-642 and VA-643.

Oi--2 to 0 inches; partially decomposed leaves and twigs.

A--0 to 4 inches; very dark grayish brown (10YR 3/2) very gravelly silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; 35 percent rock fragments; very strongly acid; clear smooth boundary.

E--4 to 9 inches; dark brown (10YR 4/3) very gravelly clay loam; weak fine granular structure; friable, slightly sticky, slighlty plastic; many very fine, fine, medium, and coarse roots; 40 percent rock fragments; very strongly acid; clear wavy boundary.

Bw--9 to 26 inches; yellowish brown (10YR 5/4) very gravelly clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; thin very patchy clay films on faces of peds; 50 percent rock fragments; strongly acid; gradual smooth boundary.

C--26 to 60 inches; yellowish brown (10YR 5/6) extremely cobbly loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; 75 percent rock fragments; strongly acid.

Table C: Chemical properties* for Parker very gravelly silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	60	7	31	36	--	2.3
4-9	60	14	3	44	--	0.5
9-26	48	39	3	39	--	0.1
26-44	36	23	29	36	--	0.1
44-60	36	26	18	37	--	0.3

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Parker very gravelly silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	$g\ kg^{-1}$ of soil							
0-4	48	82	82	72	34	318	536	146
4-9	68	74	68	60	28	298	396	306
9-26	68	78	64	60	32	302	382	316
26-44	152	120	88	86	42	488	356	156
44-60	84	104	90	86	50	414	430	156

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Suches Series

Soils of the Suches series are very deep and well to moderately well drained. These soils formed in recent alluvial materials weathered from crystalline rocks. They are on floodplains and alluvial fans in the Piedmont physiographic province. Slopes range from 0 to 2 percent.

A typical pedon of Suches fine sandy loam, in an area of Suches-Codorus complex, 0 to 2 percent slopes, is located about 0.9 mile north-northeast (26 degrees) of the intersection of Highways VA-619 and VA-609, 1.8 miles north-northwest (330 degrees) of the intersection of Highways VA-609 and US-29, and 4.4 miles north of Ruckersville.

Ap--0 to 12 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; very friable; common very fine and fine roots; common fine discontinuous tubular pores; common fine flakes of mica; slightly acid; clear smooth boundary.

Bw1--12 to 17 inches; yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable, slightly sticky; slightly plastic; common very fine and fine roots, common fine discontinuous tubular pores; common fine flakes of mica; strongly acid; clear wavy boundary.

Bw2--17 to 27 inches; yellowish brown (10YR 5/4) loam; common medium distinct strong brown (7.5Y 4/6) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; many fine discontinuous tubular pores; common concretions and black stains on faces of peds; common fine flakes of mica; strongly acid; clear wavy boundary.

Bw3--27 to 32 inches; mottled yellowish brown (10YR 5/4), very pale brown (10YR 7/3), and strong brown (7.5YR 4/6) loam; weak coarse prismatic structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; few very fine roots; common fine tubular pores and vesicular pores; strongly acid; gradual smooth boundary.

Bw4--32 to 49 inches; mottled yellowish brown (10YR 5/4) very pale brown (10YR 7/4), and strong brown (7.5YR 4/6) fine sandy loam; weak coarse subangular blocky structure; friable; few very fine roots; common fine vesicular pores; common fine flakes of mica; strongly acid; gradual smooth boundary.

C1--49 to 63 inches; variegated yellowish brown (10YR 5/4), very pale brown (10YR 7/4), and strong brown (7.5YR 4/6) sandy loam; massive; friable; common fine vesicular pores; common fine flakes of mica; strongly acid.

Table A: Chemical properties for Suches fine sandy loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-12	4.34	1.46	0.32	11.80	17.92	34.15
12-17	3.79	0.98	0.30	16.40	21.47	23.61
17-27	4.21	0.65	0.18	15.60	20.64	24.42
27-32	3.21	0.95	0.08	14.80	19.04	22.27
32-49	4.01	2.40	0.09	17.60	24.10	26.97
49-63	4.71	3.10	0.11	14.40	22.32	35.48

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Suches fine sandy loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-12	1.2	6.10	--	6.12	100.00
12-17	0.9	5.26	0.45	5.52	91.85
17-27	0.7	5.54	0.55	5.59	90.16
27-32	0.7	5.53	0.65	4.89	86.71
32-49	0.7	5.17	1.55	8.05	80.75
49-63	0.6	5.45	0.95	8.87	89.29

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Suches fine sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-12	828	120	35	20	--	3.5
12-17	540	68	27	14	--	2.1
17-27	660	62	24	9	--	1.4
27-32	528	103	33	8	--	1.6
32-49	768	120	60	8	--	1.9
49-63	876	120	60	11	--	1.4

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Suches fine sandy loam

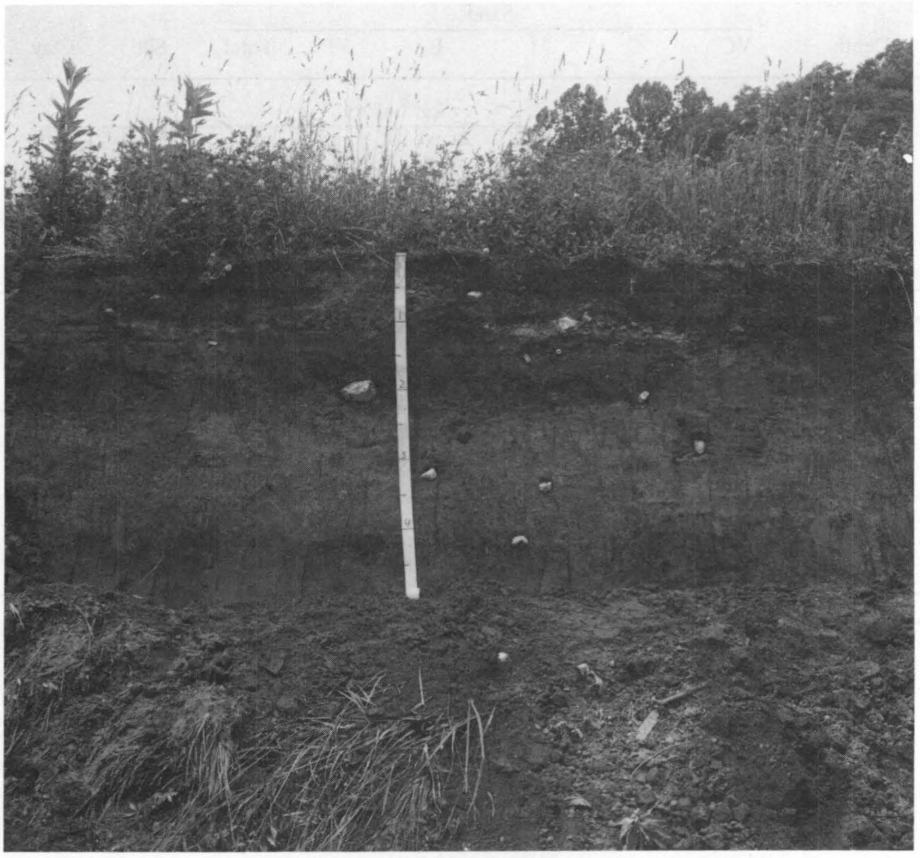
Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-12	1	5	68	289	195	558	307	135
12-17	3	14	21	95	146	280	495	225
17-27	10	18	22	74	149	273	501	226
27-32	8	20	36	164	208	436	389	175
32-49	7	19	39	155	175	395	377	228
49-63	4	22	121	235	125	507	298	195

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Suches fine sandy loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
12-32	490	370	30	40	40	30	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.



Photograph 14: Profile of Suches fine sandy loam, in an area of Suches-Codorus complex.

Suches Series - Supplemental profile 1

Suches fine sandy loam, in an area of Suches-Codorus complex, is located about 0.2 mile east of the intersection of Highways VA-619 and VA-609 and 1.4 miles northwest of the intersection of Highways VA-609 and US-29.

Ap--0 to 9 inches; brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; very friable; many very fine and fine roots; 2 percent rock fragments; strongly acid; clear smooth boundary.

Bw--9 to 30 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky; common very fine and fine roots; moderately acid; clear smooth boundary.

C1--30 to 36 inches; mottled yellowish brown (10YR 5/4), yellowish red (5YR 4/6), and dark grayish brown (2.5Y 4/2) loam; massive; friable, slightly sticky, slightly plastic; few very fine and fine roots; strongly acid; abrupt wavy boundary.

Ab1--36 to 40 inches; dark grayish brown (2.5Y 4/2) sandy loam; common medium prominent yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; few very fine roots; strongly acid; abrupt wavy boundary.

Cb2--40 to 55 inches; mottled dark grayish brown (10YR 4/2) and strong brown (7.5YR 4/6) stratified sandy loam; massive; very friable; strongly acid; abrupt smooth boundary.

Ab2--55 to 61 inches; dark gray (5Y 4/1) sandy loam; common fine prominent strong brown (7.5YR 4/6) mottles; massive; friable; strongly acid.

Table C: Chemical properties* for Suches fine sandy loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-9	353	60	27	13	--	--
9-19	386	38	13	12	--	--
19-30	370	50	12	10	--	--
30-36	319	60	17	8	--	--
36-40	235	36	19	4	--	--
40-45	185	30	10	6	--	--
45-55	151	24	20	8	--	--
55-61	151	30	16	12	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Suches fine sandy loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-9	4	8	54	278	192	536	257	207
9-19	4	14	94	290	114	516	247	237
19-30	2	8	78	302	158	548	225	227
30-36	2	4	38	266	178	488	295	217
36-40	0	4	86	382	166	638	205	157
40-45	14	18	88	440	170	730	153	117
45-55	2	14	200	464	140	820	63	117
55-61	2	14	156	312	106	590	233	177

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Suches Series - Supplemental profile 2

Suches silt loam, in an area of Suches-Codorus complex, is located about 0.9 mile south of the intersection of Highways VA-623 and VA-633 and 1.4 miles west-southwest of the intersection of Highways VA-633 and VA-629.

Ap--0 to 4 inches; yellowish brown (10YR 5/4) silt loam; moderate very fine and fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; 4 percent rock fragments; many fine and medium flakes of mica; neutral; clear smooth boundary.

Bw1--4 to 20 inches; strong brown (7.5YR 5/6) loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 5 percent rock fragments; many fine flakes of mica; slightly acid; clear smooth boundary.

Bw2--20 to 25 inches; dark yellowish brown (10YR 4/4) loam; common medium (10YR 5/3) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; 10 percent rock fragments; many fine and medium flakes of mica; moderately acid; abrupt smooth boundary.

Agb--25 to 32 inches; grayish brown (10YR 5/2) loam; common medium distinct strong brown (7.5YR 4/6) and few medium prominent yellowish red (5YR 5/8) and dark red (2.5YR 3/6) mottles; weak coarse platy structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; few very fine and fine roots; 5 percent rock fragments; common fine flakes of mica; moderately acid; abrupt smooth boundary.

Bwb3--32 to 42 inches; yellowish brown (10YR 5/6) loam; common fine distinct light gray (10YR 7/2) and yellowish red (5YR 5/8) mottles; weak coarse platy structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; common fine flakes of mica; strongly acid; clear wavy boundary.

BCb--42 to 55 inches; mottled pale brown (10YR 6/3), grayish brown (10YR 5/2), and strong brown (7.5YR 4/6) loam; weak coarse platy structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; common fine flakes of mica; strongly acid; clear smooth boundary.

Cb--55 to 66 inches; mottled grayish brown (10YR 5/2) and strong brown (7.5YR 4/6) sandy loam; massive; very friable; many fine and medium flakes of mica; strongly acid.

Table C: Chemical properties* for Suches silt loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-4	1116	120	11	23	--	16.1
4-20	360	48	9	12	--	5.1
20-25	252	19	10	9	--	7.5
25-32	240	18	15	9	--	3.6
32-42	144	14	15	9	--	1.5
42-55	144	15	9	11	--	2.1
55-66	72	11	9	8	--	2.3

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Suches silt loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-4	2	4	14	104	126	250	546	204
4-20	0	4	32	148	140	324	470	206
20-25	4	12	70	226	136	448	376	176
25-32	2	8	76	220	134	440	354	206
32-42	0	10	78	112	186	386	488	126
42-55	0	4	42	226	202	474	340	186
55-66	4	6	112	406	184	712	172	116

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Suches Series - Supplemental profile 3

Suches loam, in an area of Suches-Codorus complex, is located about 1 mile northwest of the intersection of Highways VA-633 and VA-604 and 0.8 mile south-southeast of the intersection of Highways VA-633 and VA-603.

A--0 to 3 inches; dark brown (10YR 4/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; strongly acid; clear smooth boundary.

AB--3 to 12 inches; brown (7.5YR 4/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 4 percent rock fragments; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt1--12 to 23 inches; dark yellowish brown (10YR 4/6) clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; thin very patchy clay films on faces of peds; few fine flakes of mica; moderately acid; clear wavy boundary.

Bt2--23 to 29 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; friable, slightly sticky, slightly plastic; few very fine and fine roots; thin very patchy clay films on faces of peds; few fine flakes of mica; moderately acid; clear wavy boundary.

Bt3--29 to 37 inches; yellowish brown (10YR 5/8) clay loam; many fine and medium distinct pale brown (10YR 6/3) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; thin very patchy clay films on faces of peds; few fine flakes of mica; moderately acid; abrupt wavy boundary.

BCt--37 to 48 inches; mottled light brownish gray (2.5Y 6/2), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/8) silt loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; thin very patchy clay films on faces of peds; few fine flakes of mica; moderately acid; abrupt smooth boundary.

2C--48 to 60 inches; variegated brown, yellow, gray, and black; extremely gravelly loamy sand; massive; very friable; 65 percent rock fragments; few fine flakes of mica.

Table C: Chemical properties* for Suches loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-3	348	61	3	25	--	--
3-12	168	35	3	11	--	--
12-23	264	107	3	11	--	--
23-29	264	120	3	8	--	--
29-37	324	120	3	6	--	--
37-48	660	120	1	9	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Suches loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-3	6	30	56	124	94	310	498	192
3-12	14	38	100	164	82	398	390	212
12-23	6	22	94	74	6	202	506	292
23-29	114	30	44	68	60	316	392	292
29-37	12	26	46	70	58	212	496	292
37-48	8	26	52	70	54	210	648	142

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Thurmont Series

Soils of the Thurmont series are very deep and well drained. These soils formed in alluvial and colluvial materials weathered from crystalline rocks. They are on dissected alluvial fans and terraces and along drainageways in the Blue Ridge and Piedmont physiographic provinces. Slopes range from 7 to 25 percent.

A typical pedon of Thurmont loam, 7 to 15 percent slopes, is located about 0.8 mile southwest (232 degrees) of the intersection of Highways VA-810 and VA-627, 2 miles west-northwest (302 degrees) of the intersection of Highways VA-602 and VA-603, and 0.8 mile southwest of Dyke.

Oi--1 to 0 inches; partially decomposed leaves and twigs.

Ap--0 to 5 inches; light olive brown (2.5Y 5/4) loam; weak fine granular structure; very friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; common fine and medium discontinuous tubular pores; 2 percent rock fragments; strongly acid; clear smooth boundary.

Bt1--5 to 9 inches; strong brown (7.5YR 5/6) loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; many fine and medium discontinuous tubular pores; thin very patchy clay films on faces of peds and in root channels; strongly acid; clear smooth boundary.

Bt2--9 to 22 inches; strong brown (7.5YR 5/8) clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; common fine and medium discontinuous tubular pores; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3--22 to 31 inches; strong brown (7.5YR 5/8) clay loam; many medium distinct yellowish brown (10YR 5/4) and yellowish red (5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine, fine, and medium roots; common fine and medium discontinuous tubular pores; thin patchy clay films on faces of peds; very strongly acid; abrupt wavy boundary.

C1--31 to 37 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/8), black (10YR 2/1), and yellowish red (5YR 5/6) sandy clay loam; massive; friable, slightly sticky, slightly plastic; common fine vesicular pores; very strongly acid; abrupt smooth boundary.

C2--37 to 46 inches; mottled light yellowish brown (2.5Y 6/4) and strong brown (7.5YR 5/6) sandy clay loam; massive; friable, slightly sticky, slightly plastic; common fine vesicular pores; very strongly acid; abrupt wavy boundary.

C3--46 to 60 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/8), yellowish red (5YR 5/6), and black (10YR 2/1) sandy loam; massive; friable; common fine vesicular pores; strongly acid.

Table A: Chemical properties for Thurmont loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-5	0.01	0.11	0.10	12.18	12.40	1.77
5-9	0.20	0.16	0.10	12.18	12.64	3.64
9-22	0.01	1.37	0.19	16.17	17.74	8.85
22-31	0.02	1.43	0.22	14.70	16.37	10.20
31-37	0.02	0.86	0.10	9.24	10.22	9.59
37-46	0.01	1.05	0.10	11.13	12.29	9.44
46-60	0.01	0.72	0.07	7.98	8.78	9.11

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Thurmont loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-5	--	4.75	3.25	3.47	6.34
5-9	--	5.05	4.95	5.41	8.50
9-22	--	5.20	6.55	8.12	19.33
22-31	--	5.30	6.95	8.62	19.37
31-37	--	5.51	3.65	4.63	21.17
37-46	--	5.48	5.15	6.31	18.38
46-60	--	5.52	3.05	3.85	20.78

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Thurmont loam

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-5	36	13	3	20	--	1.2
5-9	24	15	3	22	--	0.3
9-22	36	99	3	37	--	0.1
22-31	48	116	2	36	--	0.2
31-37	36	77	3	25	--	0.2
37-46	36	73	3	22	--	0.1
46-60	24	63	3	18	--	0.1

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Thurmont loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-5	25	82	134	133	76	450	436	114
5-9	21	61	89	97	60	328	468	204
9-22	14	39	52	52	38	195	435	370
22-31	19	54	68	52	42	235	432	333
31-37	67	139	193	184	64	647	153	200
37-46	16	75	136	202	105	534	273	193
46-60	53	131	244	241	65	734	111	155

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table E: Sand mineralogy* for Thurmont loam

Depth	Quartz	Feldspar	Mica	Opaques**	Heavy minerals#	Rock fragments@	Misc.
inches	g kg^{-1} of sand						
9-29	330	610	20	20	TR	10	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
**Opaques are ilmenite, magnetite, etc.
#Heavy minerals are translucent (zircon, tourmaline, rutile, epidote, hornblende, etc.).
@Rock fragments are mineral aggregates.

Unison Series

Soils of the Unison series are very deep and well drained. These soils formed in alluvial and colluvial materials weathered from crystalline rocks. They are on dissected alluvial fans and terraces in the Blue Ridge and Piedmont physiographic provinces. Slopes range from 0 to 15 percent.

A typical pedon of Unison loam, 0 to 2 percent slopes, is located about 0.15 mile east (108 degrees) of the intersection of Highways VA-230 and VA-667, 0.7 mile east-northeast (60 degrees) of the intersection of Highways VA-230 and VA-619, and 3 miles northeast of Stanardsville.

Ap--0 to 9 inches; brown (7.5YR 4/4) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; few fine roots; common fine discontinuous tubular pores; moderately acid; abrupt smooth boundary.

Bt1--9 to 29 inches; strong brown (7.5YR 4/6) clay; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few fine roots; many fine discontinuous tubular pores; thin patchy clay films on faces of peds; 2 percent rock fragments; strongly acid; gradual smooth boundary.

Bt2--29 to 39 inches; strong brown (7.5YR 4/6) clay; weak fine and medium subangular blocky structure; firm, sticky, plastic; few fine roots; many fine discontinuous tubular pores; thin patchy clay films on faces of peds; 5 percent rock fragments; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt3--39 to 47 inches; strong brown (7.5YR 4/6) clay; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many fine discontinuous tubular pores; thin patchy clay films on faces of peds; 2 percent rock fragments; few fine flakes of mica; strongly acid; abrupt smooth boundary.

2C--47 to 60 inches; strong brown (7.5YR 4/6) very cobbly clay loam; massive; friable, slightly sticky, slightly plastic; common fine discontinuous vesicular pores; thin patchy clay films on faces of rocks; 50 percent rock fragments; strongly acid.

Table A: Chemical properties for Unison loam

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^+	H^+		
inches	cmol (+) kg^{-1} soil					%
0-9	5.80	1.71	0.26	13.44	21.21	36.63
9-29	5.43	1.50	0.16	14.07	21.16	33.51
29-39	2.80	1.86	0.17	17.43	22.26	21.70
39-47	1.09	1.65	0.22	17.22	20.18	14.67
47-60	1.02	1.49	0.24	16.80	19.55	14.07

*$CEC = Ca^{2+} + Mg^{2+} + K^+ + H^+$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^+}{CEC} \times 100$

Table B: Chemical properties for Unison loam

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-9	--	5.90	0.05	7.82	99.36
9-29	--	5.78	0.15	7.24	97.93
29-39	--	5.60	1.35	6.18	78.16
39-47	--	5.65	2.05	5.01	59.08
47-60	--	5.62	1.55	4.30	63.95

*$ECEC = Ca^{2+} + Mg^{2+} + K^+ + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^+}{ECEC} \times 100$

Table C: Chemical properties* for Unison loam

Depth	Ca^{2+}	Mg^{2+}	P	K^+	Zn	Mn
inches	ppm					
0-9	792	120	13	51	--	--
9-29	744	120	14	18	--	3.6
29-39	348	120	16	22	--	5.5
39-47	168	120	19	29	--	4.3
47-60	168	120	23	31	--	1.7

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Unison loam

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-9	15	61	74	71	48	269	393	338
9-29	30	51	59	62	46	248	285	467
29-39	19	60	68	67	50	264	227	509
39-47	45	78	75	70	49	317	178	505
47-60	79	107	83	74	45	388	144	468

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Unison loam

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
9-29	100	--	--	550	50	300	--	

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Photograph 15: Small grain on Unison loam, 0 to 2 percent slopes, in the foreground with forests on Myersville and Catoctin extremely stony silt loams, 25 to 80 percent slopes, in the background.

Unison Series - Supplemental profile 1

Unison clay, in an area of Unison loam, 2 to 7 percent slopes, is located about 0.45 mile northwest of the intersection of Highways VA-609 and VA-619 and 1.9 miles east-northeast of the intersection of Highways VA-609 and US-33.

Ap--0 to 7 inches; strong brown (7.5YR 4/6) clay; weak fine granular structure; friable, sticky, plastic; common very fine and fine roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bt1--7 to 22 inches; yellowish red (5YR 5/6) clay; weak fine subangular blocky structure; firm, sticky, plastic; few very fine and fine roots; thin patchy clay films on faces of peds; 3 percent rock fragments; few fine flakes of mica; strongly acid; clear wavy boundary.

Bt2--22 to 37 inches; yellowish red (5YR 4/6) clay; weak fine and medium subangular blocky structure; firm, sticky, plastic; few very fine roots; thin patchy clay films on faces of peds; many black concretions and stains of manganese; 2 percent rock fragments; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bt3--37 to 53 inches; yellowish red (5YR 4/6) clay; weak medium subangular blocky structure; firm, sticky, plastic; thin patchy clay films on faces of peds; few black concretions and stains of manganese; 10 percent rock fragments; few fine flakes of mica; very strongly acid; clear smooth boundary.

BCt--53 to 64 inches; strong brown (7.5YR 5/8) clay; weak fine subangular blocky structure; firm, sticky, plastic; thin patchy clay films on faces of peds; 15 percent rock fragments; few fine flakes of mica; very strongly acid.

Table A: Chemical properties for Unison clay

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-7	4.39	1.15	0.70	19.40	25.64	24.34
7-22	4.20	1.12	0.16	19.80	25.28	21.68
22-37	0.92	1.02	0.16	21.80	23.90	8.79
37-53	0.43	0.88	0.19	16.40	17.90	8.38
53-64	0.34	0.70	0.27	16.40	17.71	7.40

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Unison clay

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-7	--	5.10	0.35	6.59	94.69
7-22	--	5.16	0.65	6.13	89.40
22-37	--	4.80	2.65	4.75	44.21
37-53	--	4.68	3.35	4.85	30.93
53-64	--	4.94	2.15	3.46	37.86

*ECEC = $Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**EBS = $\frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Unison clay

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-7	576	86	8	50	--	--
7-22	504	80	9	11	--	--
22-37	108	71	11	12	--	--
37-53	72	59	13	17	--	--
53-64	72	50	11	22	--	--

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Unison clay

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-7	16	40	56	76	40	228	358	414
7-22	20	36	48	64	38	206	290	504
22-37	18	34	42	56	32	182	244	574
37-53	26	38	44	50	28	186	210	604
53-64	40	60	58	68	34	260	206	534

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Unison clay

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
7-22	340	--	--	610	--	--	--	

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Unison Series - Supplemental profile 2

Unison clay, in an area of Unison loam 2 to 7 percent slopes, is located about .6 mile east-northeast of the intersection of Highways US-29 and VA-609 and 1.4 miles northeast of the intersection of Highways US-29 and VA-633.

Ap--0 to 8 inches; strong brown (7.5YR 4/6) clay; moderate fine and medium granular structure; firm, sticky, plastic; common very fine, fine, and medium roots; few fine flakes of mica; strongly acid; abrupt smooth boundary.

Bt1--8 to 28 inches; yellowish red (5YR 5/6) clay; common medium distinct manganese stains; moderate medium subangular blocky structure; firm, sticky, plastic; common very fine, fine, and medium roots; thick patchy clay films on faces of peds; few fine flakes of mica; moderately acid; gradual smooth boundary.

Bt2--28 to 37 inches; yellowish red (5YR 4/6) clay; few medium distinct manganese stains; moderate medium subangular blocky structure; firm, sticky, plastic; few very fine, fine, and medium roots; thin patchy clay films on faces of peds; common fine flakes of mica; moderately acid; clear smooth boundary.

BCt--37 to 54 inches; strong brown (7.5YR 4/6) clay; weak medium prismatic structure parting to weak fine and medium subangular blocky; firm, sticky, plastic; few very fine roots; thin very patchy clay films on faces of peds; common fine flakes of mica; strongly acid; clear wavy boundary.

C--54 to 61 inches; strong brown (7.5YR 5/6) sandy clay; massive; firm, sticky, plastic; few very fine roots; common fine flakes of mica; very strongly acid.

Table A: Chemical properties for Unison clay

Depth	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
inches	cmol (+) kg^{-1} soil					%
0-8	4.58	1.17	0.11	12.20	18.06	32.45
8-28	4.75	1.43	0.23	10.20	16.61	38.59
28-37	4.80	1.19	0.18	9.80	15.97	38.63
37-54	3.99	1.09	0.20	9.60	14.88	35.48
54-61	1.43	1.02	0.29	10.60	13.34	20.54

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B: Chemical properties for Unison clay

Depth	Organic matter	pH	Al^{3+}	ECEC*	EBS**
inches	g kg^{-1}		cmol (+) kg^{-1} soil		%
0-8	--	5.21	0.65	6.51	90.02
8-28	--	5.64	0.15	6.56	97.71
28-37	--	5.80	0.05	6.22	99.20
37-54	--	5.35	0.15	5.43	97.24
54-61	--	4.63	1.05	3.79	72.30

*$ECEC = Ca^{2+} + Mg^{2+} + K^{+} + Al^{3+}$

**$EBS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{ECEC} \times 100$

Table C: Chemical properties* for Unison clay

Depth	Ca^{2+}	Mg^{2+}	P	K^{+}	Zn	Mn
inches	ppm					
0-8	624	96	24	157	--	11.9
8-28	660	103	13	15	--	2.0
28-37	540	73	13	15	--	0.9
37-54	348	68	15	22	--	1.1
54-61	204	78	17	40	--	1.0

*Soil Testing Laboratory, Virginia Tech, Blacksburg, VA 24061.

Table D: Particle-size distribution* for Unison clay

Depth	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
inches	g kg^{-1} of soil							
0-8	14	38	52	90	50	244	265	491
8-28	12	38	50	70	44	214	225	561
28-37	12	46	52	70	46	226	243	531
37-54	16	70	70	78	56	290	219	491
54-61	52	140	116	100	50	458	181	361

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.

Table F: Clay mineralogy* for Unison clay

Depth	HIV*	MIC*	VER*	KAO*	QTZ*	MON*	GIB*	MISC*
inches	g kg^{-1} of clay							
8-28	260	50	--	640	50	--	--	--

*Virginia Tech Soil Survey Laboratory, Blacksburg, VA 24061.
*HIV = hydroxy interlayered vermiculite, MIC = mica, VER = vermiculite, KAO = kaolinite, QTZ = quartz, MON = montmorillonite, GIB = gibbsite, and MISC = miscellaneous.

Appendix - Descriptions and Data for Soil Profiles in Map Unit 26B

Sampling Method

Soils in map unit 26B were sampled according to a random-effects, three-level, nested design as defined by Sokal and Rohlf (1969). Three delineations with three sites within each delineation and three soil profiles within each site; i.e., within 25 feet, were sampled. Each soil profile was described according to current procedures of the National Cooperative Soil Survey using a 72 inch orchard auger with a bucket that had a 2.50 inch inside diameter. Taxonomic control sections as defined by Soil Survey Staff (1975) were thoroughly mixed and sampled. Samples were analyzed according to procedures given in the Materials and Method section.

Interpretations for this sampling design are reported by Edmonds (1983), Edmonds et al. (1985a), Edmonds et al. (1985b), and Edmonds and Lentner (1986).

Photograph 16: Hay on map unit 26B - Elioak loam, 2 to 7 percent slopes.

MAP UNIT 26B - Elioak loam, 2 to 7 percent slopes

Delineation 1

Location: About 1 mile southwest of the intersection of Highways VA-633 and US-33 and 0.8 mile south of the intersection of Highways VA-633 and VA-617.

Relief: 40 feet.

Site 1

Location: About 1 mile southwest 220 degrees of the intersection of Highways VA-633 and US-33 and 0.8 mile south 186 degrees of the intersection of Highways VA-633 and VA-617.

Vegetation: Reestablished pine and hardwood forest.

Elevation: 640 feet.

Slope: 4%.

Profile 1 (GE-1-1-1)

Ap--0 to 9 inches; brown (7.5YR 5/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; 4 percent rock fragments; abrupt smooth boundary.

Bt1--9 to 14 inches; strong brown (7.5YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; common thin clay films on faces of peds; 10 percent rock fragments; clear smooth boundary.

Bt2--14 to 34 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt3--34 to 44 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

BCt--44 to 57 inches; red (2.5YR 4/8) clay loam; common medium distinct yellowish red (5YR 5/8), reddish yellow (7.5YR 6/6), and white (10YR 8/1) mottles; weak fine subangular blocky structure; friable,

slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--57 to 72 inches; mottled red (2.5YR 4/8), reddish yellow (7.5YR 6/6), and white (10YR 8/1) sandy clay loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 2 (GE-1-1-2)

Ap--0 to 6 inches; brown (7.5YR 5/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; 5 percent rock fragments; abrupt smooth boundary.

Bt1--6 to 11 inches; yellowish red (5YR 5/8) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; few thin clay films on faces of peds; 1 percent coarse fragments; clear smooth boundary.

Bt2--11 to 31 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt3--31 to 43 inches; red (2.5YR 4/8) clay; common medium distinct reddish yellow (5YR 7/8) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

BCt--43 to 62 inches; red (2.5YR 4/8) clay loam; many medium and coarse distinct reddish yellow (7.5YR 6/6) mottles; weak fine and medium subangular blocky structure; friable, sticky, plastic; few thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

C--62-72 inches; red (2.5YR 4/8) sandy clay loam; many medium and coarse distinct reddish yellow (7.5YR 6/6) and white (10YR 8/1) mottles; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 3 (GE-1-1-3)

Ap--0 to 5 inches; brown (7.5YR 5/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; 5 percent coarse fragments; abrupt smooth boundary.

Bt1--5 to 11 inches; strong brown (7.5YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; few thin clay films on faces of peds; 10 percent rock fragments; clear smooth boundary.

Bt2--11 to 31 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt3--31 to 41 inches; red (2.5YR 4/6) clay; common medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, slightly plastic; many thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--41 to 51 inches; red (2.5YR 4/8) clay loam; many medium and coarse distinct reddish yellow (7.5YR 6/6) and white (10YR 8/1) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

C--51 to 72 inches; mottled red (2.5YR 4/8), reddish yellow (7.5YR 6/8), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Site 2

Location: About 1.5 miles west southwest 238 degrees of the intersection of Highways VA-633 and US-33 and 1.1 miles southwest 218 degrees of the intersection of Highways VA-633 and VA-617.

Vegetation: Reestablished pine and hardwood forest.

Elevation: 610 feet.

Slope: 1%

Profile 4 (GE-1-2-1)

Ap--0 to 8 inches; yellowish red (5YR 5/8) clay loam; weak medium granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; common fine flakes of mica; abrupt smooth boundary.

Bt1--8 to 30 inches; red (2.5YR 4/6) clay, moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--30 to 53 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

BCt--53 to 69 inches; red (2.5YR 4/6) clay loam; common medium and coarse distinct strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--69 to 72 inches; mottled red (2.5YR 4/8), strong brown (7.5YR 5/6), reddish yellow (5YR 6/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 5 (GE-1-2-2)

Ap--0 to 4 inches; yellowish red (5YR 5/6) clay loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; common fine flakes of mica; abrupt smooth boundary.

Bt1--4 to 24 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--24 to 34 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; many thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--34 to 44 inches; red (2.5YR 4/6) clay loam; common medium and coarse distinct strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

C--44 to 72 inches; mottled red (2.5YR 4/8), strong brown (7.5YR 5/6), reddish yellow (5YR 6/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 6 (GE-1-2-3)

Ap--0 to 4 inches; yellowish red (5YR 5/8) clay loam; weak medium granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; common fine flakes of mica; abrupt smooth boundary.

Bt1--4 to 24 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--24 to 46 inches; red (2.5YR 4/6) clay, moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

BCt--46 to 61 inches; red (2.5YR 4/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

C--61 to 72 inches; yellowish red (5YR 4/6) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Site 3

Location: About 1 mile southwest 236 degrees of the intersection of Highways VA-633 and U.S.-33 and 0.6 mile southwest 202 degrees of the intersection of Highways VA-633 and VA-617.

Vegetation: Orchardgrass hay.

Elevation: 670 feet

Slope: 3%

Profile 7 (GE-1-3-1)

Ap--0 to 8 inches, strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine roots; 2 percent rock fragments; abrupt smooth boundary.

Bt1--8 to 28 inches, red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable, sticky, plastic; thin continuous clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--28 to 47 inches, red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable, sticky, plastic; thin continuous clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--47 to 69 inches, red (2.5YR 4/6) clay loam; weak fine and medium subangular blocky structure; friable, sticky, plastic; thin continuous clay films on faces of peds; many fine flakes of mica; abrupt smooth boundary.

C--69 to 72 inches, mottled red (2.5YR 4/8), strong brown (7.5YR 5/6), reddish yellow (5YR 6/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 8 (GE-1-3-2)

Ap--0 to 9 inches, strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine and medium roots; 5 percent rock fragments; abrupt smooth boundary.

Bt1--9 to 29 inches, red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable, sticky, plastic; thin continuous clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--29 to 49 inches, red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable, sticky, plastic; thin continuous clay films on faces of peds; common fine flakes of mica; abrupt smooth boundary.

Ct--49 to 72 inches, mottled red (2.5YR 4/8), strong brown (7.5YR 5/6), reddish yellow (5YR 6/6), and white (10YR 8/1) clay loam; massive; friable, slightly sticky, slightly plastic; common clay flows along relic rock joints; many fine flakes of mica.

Profile 9 (GE-1-3-3)

Ap--0 to 8 inches, strong brown (7.5Y 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine and medium roots; 5 percent rock fragments; clear smooth boundary.

Bt1--8 to 38 inches, red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin continuous clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--38 to 54 inches, red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; thin continuous clay films on faces of peds; common fine flakes of mica; clear smooth boundary.

BCt--54 to 65 inches, red (2.5YR 4/6) clay loam, common medium and coarse distinct brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many thin clay films on faces of peds; many fine flakes of mica; abrupt smooth boundary.

C--65 to 72 inches, mottled red (2.5YR 4/6), reddish yellow (5YR 6/6), strong brown (7.5YR 5/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Delineation 2

Location: About 1.1 miles north of the intersection of Highways VA-609 and VA-619 and 2.48 miles northeast of the intersection of Highways VA-609 and US-33.

Relief: 60 feet.

Site 1

Location: About 1.1 miles north (352 degrees) of the intersection of Highways VA-609 and VA-619 and 2.46 miles northeast (52 degrees) of the intersection of Highways VA-609 and US-33.

Vegetation: Orchardgrass-clover hay.

Elevation: 600 feet.

Slope: 3%

Profile 10 (GE-2-1-1)

Ap--0 to 7 inches; brown (7.5YR 4/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; 2 percent rock fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--7 to 27 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--27 to 52 inches; red (2.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/4) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

BCt--52 to 69 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/4), and reddish yellow (7.5YR 6/8) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--69 to 72 inches; mottled strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 11 (GE-2-1-2)

Ap--0 to 6 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; 2 percent rock fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--6 to 26 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--26 to 55 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; clear smooth boundary.

BCt--55 to 70 inches; mottled red (2.5YR 4/6) and strong brown (7.5YR 5/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--70 to 72 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 4/6), and reddish yellow (7.5YR 6/8) sandy loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 12 (GE-2-1-3)

Ap--0 to 8 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; 5 percent coarse fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--8 to 28 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--28 to 61 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

BCt--61 to 72 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 4/6), and reddish yellow (7.5YR 6/8) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica.

Site 2

Location: About 1.2 miles north 350 degrees of the intersection of Highways VA-609 and VA-619 and 2.5 miles northeast 50 degrees of the interesection of Highways VA-609 and US-33.

Vegetation: Mature oak-pine forest

Elevation: 610 feet

Slope: 1 %

Profile 13 (GE-2-2-1)

Ap--0 to 8 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine medium and coarse roots; few fine flakes of mica; abrupt smooth boundary.

Bt1--8 to 28 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; many thin continuous clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--28 to 50 inches; red (2.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/4) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; thin continuous clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--50 to 59 inches; mottled red (2.5YR 4/6), reddish yellow (7.5YR 6/8) and yellowish brown (10YR 5/4) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

C--59 to 72 inches; mottled red (2.5YR 4/6), reddish yellow (5YR 6/8), yellowish brown (10YR 5/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 14 (GE-2-2-2)

Ap--0 to 6 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; few fine flakes of mica; abrupt smooth boundary.

Bt1--6 to 26 inches; red (2.5YR 4/8) clay; few medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; thin continuous clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--26 to 38 inches; red (2.5YR 4/8) clay; many medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; common thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--38 to 50 inches; mottled red (2.5YR 4/8), reddish yellow (7.5YR 6/6), and yellowish brown (10YR 5/4) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--50 to 72 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 4/6), reddish yellow (7.5YR 6/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 15 (GE-2-2-3)

Ap--0 to 6 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; 5 percent coarse fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--6 to 26 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; thin continuous clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--26 to 42 inches; red (2.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/4) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; thin continuous clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

BCt--42 to 56 inches; yellowish red (5YR 5/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

C--56 to 72 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 4/6), reddish yellow (7.5YR 6/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; few fine roots; many fine flakes of mica.

Site 3

Location: About 1.15 miles north 350 degrees of the intersection of Highways VA-609 and VA-619 and 2.48 miles northeast 51 degrees of the intersection of Highways VA-609 and US-33.

Vegetation: Mature oak-pine forest.

Elevation: 610 feet.

Slope: 2%

Profile 16 (GE-2-3-1)

Ap--0 to 7 inches; strong brown (7.5YR 4/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; few fine flakes of mica; abrupt smooth boundary.

Bt1--7 to 27 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine, medium and coarse roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--27 to 44 inches; red (2.5YR 4/6) clay; few medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; many thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

BCt--44 to 60 inches; yellowish red (5YR 5/6) clay loam; many medium distinct reddish yellow (7.5YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--60 to 72 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 4/8), reddish yellow (7.5YR 6/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 17 (GE-2-3-2)

Ap--0 to 7 inches; yellowish brown (10YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; 7 percent rock fragments; clear smooth boundary.

Bt1--7 to 27 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine, medium, coarse, and very coarse roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--27 to 37 inches; red (2.5YR 4/6) clay; common medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

BCt--37 to 63 inches; mottled red (2.5YR 4/6) and yellowish brown (10YR 5/4) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--63 to 72 inches; strong brown (7.5YR 5/8) loam; common medium distinct red (2.5YR 4/6) and white (10YR 8/1) mottles; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 18 (GE-2-3-3)

Ap--0 to 13 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; 10 percent rock fragments; clear smooth boundary.

Bt1--13 to 33 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--33 to 55 inches; red (2.5YR 4/6) clay; common medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; thin continuous clay films on faces of peds; many fine flakes of mica; diffuse smooth boundary.

C--55 to 72 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 4/8), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Delineation 3

Location: About 0.68 mile west of the intersection of Highways VA-609 and US-29 and 0.75 mile north of the intersection of Highways VA-633 and US-29.

Relief: 40 feet.

Site 1

Location About 0.66 mile west 279 degrees of the intersection of Highways VA-609 and US-29 and 0.74 mile north 340 degrees of the intersection of Highway VA-633 and US-29.

Vegetation: Orchardgrass pasture.

Elevation: 518 feet.

Slope: 7%

Profile 19 (GE-3-1-1)

Ap--0 to 9 inches; yellowish red (5YR 4/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; few fine flakes of mica; abrupt smooth boundary.

Bt1--9 to 29 inches; red (2.5YR 4/6) clay; few medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--29 to 40 inches; red (2.5YR 4/6) clay; common medium distinct reddish yellow (7.5Y 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; clear smooth boundary.

BCt--40 to 52 inches; yellowish red (5YR 4/6) clay loam; many medium and coarse distinct yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; gradual smooth bundary.

C--52 to 72 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 4/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Profile 20 (GE-3-1-2)

Ap--0 to 8 inches; yellowish red (5YR 4/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; 5 percent rock fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--8 to 28 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--28 to 40 inches; red (2.5YR 4/6) clay; many medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

BCt--40 to 54 inches; yellowish red (5YR 5/6) loam; many medium and coarse distinct yellowish brown (10YR 5/4), and red (2.5YR 4/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--54 to 72 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 4/6), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Pofile 21 (GE-3-1-3)

Ap--0 to 5 inches; strong brown (7.5YR 4/6) friable, slightly sticky, slightly plastic; many fine roots; 5 percent rock fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--5 to 25 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--25 to 39 inches; red (2.5YR 4/6) clay; common medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

BCt--39 to 46 inches; yellowish red (5YR 5/6) loam; many medium and coarse distinct reddish yellow (7.5YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

C--46 to 72 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 4/8), and white (10YR 8/1) loam; massive; friable, slightly sticky, slightly plastic; many fine flakes of mica.

Site 2

Location: About 0.80 mile northwest 304 degrees of the intersection of Highways VA-609 and US-29 and 1.2 miles north 345 degrees of the intersection of Highways VA-633 and US-29.

Vegetation: Orchardgrass pasture.

Elevation: 610 feet.

Slope: 6%

Profile 22 (GE-3-2-1)

Ap--0 to 8 inches; strong brown (7.5YR 4/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; few fine flakes of mica; abrupt smooth boundary.

Bt1--8 to 28 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--28 to 60 inches; red (2.5YR 4/6) clay; few medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--60 to 72 inches; red (2.5YR 5/6) clay loam; common medium and coarse reddish yellow (7.5YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds, many fine flakes of mica.

Profile 23 (GE-3-2-2)

Ap--0 to 8 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; 10 percent rock fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--8 to 28 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--28 to 57 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--57 to 72 inches; red (2.5YR 4/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica.

Profile 24 (GE-3-2-3)

Ap--0 to 4 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; 5 percent rock fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--4 to 24 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--24 to 59 inches; red (2.5YR 4/6) clay; many medium distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; many fine flakes of mica; clear smooth boundary.

BCt--59 to 72 inches; red (2.5YR 4/6) clay loam; many medium and coarse distinct reddish yellow (7.5YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica.

Site 3

Location: About 0.5 mile west 293 degrees of the intersection of Highways VA-609 and US-29 and 0.77 mile north 352 degrees of the intersection of Highways VA-633 and US-29.

Vegetation: Pasture with large tree.

Elevation: 580 feet.

Slope: 7%

Profile 25 (GE-3-3-1)

Ap--0 to 9 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; 5 percent coarse fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--9 to 29 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and medium roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--29 to 50 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine and me-

dium roots; many thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--50 to 72 inches; yellowish red (5YR 4/6) loam; common medium and coarse distinct reddish yellow (7.5YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; common thin clay films on faces of peds; many fine flakes of mica.

Profile 26 (GE-3-3-2)

Ap--0 to 7 inches; strong brown (7.5YR 4/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine medium and coarse roots; 5 percent coarse fragments; few fine flakes of mica; abrupt smooth boundary.

Bt1--7 to 27 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; common thin clay films on faces of peds; 2 percent rock fragments; common fine flakes of mica; gradual smooth boundary.

Bt2--27 to 49 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

BCt--49 to 72 inches; yellowish red (5YR 5/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; common thin clay films on faces of peds; many fine flakes of mica.

Profile 27 (GE-3-3-3)

Ap--0 to 8 inches; strong brown (7.5YR 5/6) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; few fine flakes of mica; abrupt smooth boundary.

Bt1--8 to 28 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; common thin clay films on faces of peds; common fine flakes of mica; gradual smooth boundary.

Bt2--28 to 50 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable, sticky, plastic; few fine roots; many thin clay films on faces of peds; many fine flakes of mica; gradual smooth boundary.

BCt--50 to 72 inches; yellowish red (5YR 5/6) clay loam; common medium and coarse distinct red (2.5YR 4/6) and reddish yellow (7.5YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly

sticky, slightly plastic; common thin clay films on faces of peds; many fine flakes of mica.

Table A1: Chemical properties for taxonomic control section of soils in map unit 26B

Id. No.#	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
	cmol (+) kg^{-1} soil					%
1111	0.00	0.11	0.09	6.00	6.20	3.23
1112	0.00	0.10	0.08	6.40	6.58	2.74
1121	0.00	0.26	0.11	12.00	12.37	2.99
1122	0.00	0.27	0.10	10.80	11.17	3.31
1131	0.00	0.13	0.08	6.40	6.61	3.18
1132	0.02	0.13	0.09	7.20	7.44	3.23
1211	0.00	0.39	0.09	10.80	11.28	4.26
1212	0.00	0.43	0.10	11.00	11.53	4.60
1221	0.00	0.26	0.17	11.00	11.43	3.76
1222	0.00	0.26	0.17	11.20	11.63	3.70
1231	0.00	0.41	0.14	9.00	9.55	5.76
1232	0.00	0.42	0.12	10.00	10.54	5.12
1311	0.00	0.37	0.13	11.60	12.10	4.13
1312	0.01	0.43	0.15	12.00	12.59	4.69
1321	0.00	0.25	0.13	8.80	9.18	4.14
1322	0.05	0.25	0.17	9.80	10.27	4.58
1331	0.00	0.19	0.12	9.60	9.91	3.13
1332	0.06	0.21	0.14	7.20	7.61	5.39
2111	0.00	0.44	0.18	7.20	7.82	7.93
2112	0.00	0.43	0.16	8.80	9.39	6.28
2121	0.00	0.45	0.17	9.40	10.02	6.19
2122	0.03	0.50	0.18	9.60	10.31	6.89
2131	0.00	0.42	0.17	7.20	7.79	7.57
2132	0.02	0.50	0.20	8.00	8.72	8.26
2211	0.00	0.46	0.13	9.60	10.19	5.79
2212	0.00	0.45	0.10	7.80	8.35	6.59
2221	0.00	0.30	0.18	9.00	9.48	5.06
2222	0.00	0.32	0.18	8.80	9.30	5.38

#Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory.

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table A2: Chemical properties for taxonomic control section of soils in map unit 26B

Id. No.#	Exchangeable cations				CEC*	BS**
	Ca^{2+}	Mg^{2+}	K^{+}	H^{+}		
	cmol (+) kg^{-1} soil					%
2231	0.00	0.45	0.16	8.80	9.41	6.48
2232	0.00	0.44	0.12	9.60	10.16	5.51
2311	0.00	0.29	0.12	9.00	9.41	4.36
2312	0.00	0.31	0.11	10.40	10.82	3.88
2321	0.00	0.36	0.14	10.60	11.10	4.50
2322	0.00	0.38	0.11	10.80	11.29	4.34
2331	0.00	0.28	0.08	8.60	8.96	4.02
2332	0.00	0.29	0.09	7.80	8.18	4.65
3111	0.00	0.35	0.14	10.00	10.49	4.67
3112	0.01	0.37	0.15	11.60	12.13	4.37
3121	0.01	0.49	0.17	13.00	13.67	4.90
3122	0.01	0.49	0.16	13.40	14.06	4.69
3131	0.00	0.48	0.18	10.20	10.86	6.08
3132	0.05	0.48	0.16	12.00	12.69	5.44
3211	0.00	0.22	0.06	11.00	11.28	2.48
3212	0.03	0.25	0.07	13.00	13.35	2.62
3221	0.00	0.18	0.05	13.00	13.23	1.74
3222	0.01	0.21	0.05	13.80	14.07	1.92
3231	0.00	0.21	0.03	11.40	11.64	2.06
3232	0.04	0.24	0.03	12.60	12.91	2.40
3311	0.00	0.47	0.27	9.40	10.14	7.30
3312	0.05	0.51	0.33	9.40	10.29	8.65
3321	0.00	0.36	0.20	10.00	10.56	5.30
3322	0.00	0.37	0.20	10.80	11.37	5.01
3331	0.00	0.41	0.13	8.40	8.94	6.04
3332	0.01	0.44	0.15	9.80	10.40	5.77

#Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory.

*$CEC = Ca^{2+} + Mg^{2+} + K^{+} + H^{+}$

**$BS = \frac{Ca^{2+} + Mg^{2+} + K^{+}}{CEC} \times 100$

Table B1: Chemical properties for taxonomic control section soils in map unit 26B

Id. No.#	pH	BASUM##	Al^{3+}	ECEC*	EBS**
		cmol (+) kg^{-1} soil			%
1111	4.08	0.20	2.65	2.85	7.02
1112	4.33	0.18	2.75	2.93	6.14
1121	4.57	0.37	3.75	4.12	8.98
1122	4.69	0.37	3.55	3.92	9.44
1131	4.97	0.21	3.85	4.06	5.17
1132	4.65	0.24	3.45	3.69	6.50
1211	4.85	0.48	2.25	2.73	17.58
1212	4.52	0.53	2.15	2.68	19.78
1221	4.42	0.43	2.90	3.33	12.91
1222	4.60	0.43	2.85	3.28	13.11
1231	4.53	0.55	2.05	2.60	21.15
1232	4.80	0.54	2.25	2.79	19.35
1311	4.65	0.50	2.25	2.75	18.18
1312	4.35	0.59	2.05	2.64	22.35
1321	4.99	0.38	2.65	3.03	12.54
1322	4.62	0.47	2.45	2.92	16.10
1331	5.02	0.31	3.05	3.36	9.23
1332	4.80	0.41	2.75	3.16	12.97
2111	4.01	0.62	1.95	2.57	24.12
2112	4.31	0.59	2.05	2.64	22.35
2121	5.02	0.62	2.25	2.87	21.60
2122	4.62	0.71	2.05	2.76	25.72
2131	5.11	0.59	2.25	2.84	20.77
2132	4.78	0.72	2.25	2.97	24.24
2211	3.92	0.59	3.75	4.34	13.59
2212	4.16	0.55	3.55	4.10	13.41
2221	4.49	0.48	2.45	2.93	16.38
2222	4.70	0.50	2.45	2.95	16.95

#Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory.

##BASUM = Ca^{2+} + Mg^{2+} + K^{+}

*ECEC = BASUM + Al^{3+}

**EBS = $\frac{\text{BASUM}}{\text{ECEC}} \times 100$

Table B2: Chemical properties for taxonomic control section soils in map unit 26B

Id. No.#	pH	BASUM##	Al^{3+}	ECEC*	EBS**
		cmol (+) kg^{-1} soil			%
2231	4.00	0.61	3.75	4.36	13.99
2232	4.32	0.56	3.95	4.51	12.42
2311	4.63	0.41	2.65	3.06	13.40
2312	4.72	0.42	2.65	3.07	13.68
2321	4.20	0.50	2.95	3.45	14.49
2322	4.30	0.49	2.85	3.34	14.67
2331	4.25	0.36	2.45	2.81	12.81
2332	4.38	0.38	2.55	2.93	12.97
3111	4.53	0.49	3.75	4.24	11.56
3112	4.65	0.53	3.75	4.28	12.38
3121	3.82	0.67	4.95	5.62	11.92
3122	3.96	0.66	5.25	5.91	11.17
3131	4.82	0.66	3.85	4.51	14.63
3132	4.40	0.69	3.95	4.64	14.87
3211	4.84	0.28	4.55	4.83	5.80
3212	4.36	0.35	4.35	4.70	7.45
3221	3.73	0.23	5.75	5.98	3.85
3222	3.88	0.27	6.50	6.77	3.99
3231	4.72	0.24	4.25	4.49	5.35
3232	4.30	0.31	4.05	4.36	7.11
3311	4.94	0.74	3.25	3.99	18.55
3312	4.64	0.89	2.95	3.84	23.18
3321	4.30	0.56	3.65	4.21	13.30
3322	4.46	0.57	4.05	4.62	12.34
3331	4.95	0.54	2.75	3.29	16.41
3332	4.65	0.60	2.85	3.45	17.39

#Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory.

##BASUM = Ca^{2+} + Mg^{2+} + K^{+}

*ECEC = BASUM + Al^{3+}

**EBS = $\frac{\text{BASUM}}{\text{ECEC}} \times 100$

Table C1: Particle-size distribution for taxonomic control section of soils in map unit 26B

Id. No.#	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
	g kg^{-1} of soil							
1111	38	33	45	69	39	224	163	613
1112	55	31	45	61	36	228	162	610
1121	22	28	56	87	42	235	175	590
1122	26	28	57	79	42	232	213	555
1131	35	29	49	78	41	232	200	568
1132	40	31	47	73	41	232	180	588
1211	1	7	31	90	73	202	138	660
1212	2	6	34	91	53	186	159	655
1221	1	6	35	105	39	186	192	622
1222	1	5	31	65	35	137	178	685
1231	2	20	26	67	39	154	111	735
1232	2	7	24	61	46	140	100	760
1311	15	18	27	54	37	151	233	616
1312	9	16	40	71	44	180	188	632
1321	5	7	24	73	52	161	147	692
1322	3	7	23	74	45	152	160	688
1331	7	8	24	69	55	163	171	666
1332	8	8	26	74	42	158	167	675
2111	6	14	40	91	61	212	248	540
2112	3	14	40	89	67	213	227	560
2121	3	16	46	99	62	226	226	548
2122	3	16	46	96	67	228	202	570
2131	3	15	42	92	61	213	230	557
2132	2	14	43	95	63	217	201	582
2211	3	6	13	70	72	164	206	630
2212	2	6	12	53	82	155	195	650
2221	7	12	20	45	42	126	244	630
2222	6	13	19	44	43	125	227	648

#Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory.

Table C2: Particle-size distribution for taxonomic control section of soils in map unit 26B

Id. No.#	Sand						Silt	Clay
	VC	C	M	F	VF	Total		
	g kg^{-1} of soil							
2231	12	13	21	50	49	145	230	625
2232	9	13	20	49	47	138	232	630
2311	7	17	28	60	51	163	237	600
2312	7	16	27	55	56	161	254	585
2321	4	10	20	48	46	128	237	635
2322	5	15	24	47	51	142	208	650
2331	3	12	23	59	55	152	258	590
2332	12	16	27	55	43	153	207	640
3111	2	8	41	118	80	249	197	554
3112	2	9	60	161	23	255	213	532
3121	1	8	48	142	72	271	209	520
3122	2	8	47	135	64	256	212	532
3131	2	10	43	175	45	275	203	522
3132	1	8	40	133	70	252	218	530
3211	2	6	33	61	34	136	179	685
3212	1	5	28	87	61	182	168	650
3221	1	6	44	81	24	156	174	670
3222	1	5	32	68	45	151	149	700
3231	1	4	25	49	27	106	169	725
3232	1	4	25	51	27	108	152	740
3311	7	17	40	98	44	206	184	610
3312	3	13	24	53	69	162	218	620
3321	8	17	45	98	38	206	199	595
3322	8	16	40	97	44	205	155	640
3331	7	18	51	118	47	241	199	560
3332	7	17	49	119	51	243	177	580

#Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory.

Table D1: Mineralogy of the sand fraction for the taxonomic control section of soils in map unit 26B

Id. No.*	QZ*	FL*	MI*	HM*	OP*
	g kg^{-1} of sand				
1111	540	410	30	10	10
1112	490	470	30	Tr	10
1121	680	260	20	0	40
1122	730	240	20	0	10
1131	620	320	30	Tr	30
1132	670	270	30	10	20
1211	800	10	90	Tr	100
1212	810	10	90	Tr	90
1221	770	10	100	0	120
1222	850	30	90	Tr	30
1231	840	20	70	0	70
1232	850	20	80	0	50
1311	810	100	50	20	20
1312	850	70	60	0	20
1321	850	30	90	0	30
1322	880	20	80	0	20
1331	730	100	70	20	80
1332	810	60	70	20	40
2111	340	640	20	0	0
2112	350	630	20	Tr	Tr
2121	320	650	20	0	10
2122	300	670	30	Tr	Tr
2131	300	670	30	0	0
2132	290	670	30	0	10
2211	670	230	100	0	Tr
2212	550	360	90	Tr	Tr
2221	450	480	40	Tr	30
2222	500	430	50	0	20

*Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory. QZ = quartz. FL = feldspar. MI = mica. HM = heavy minerals, such as epidote, zircon, etc. OP = opaques, primarily iron minerals.

Table D2: Mineralogy of the sand fraction for the taxonomic control section of soils in map unit 26B

Id No.*	QZ*	FL*	MI*	HM*	OP*
	g kg^{-1} of sand				
2231	470	470	60	0	Tr
2232	520	410	50	0	20
2311	360	550	70	0	20
2312	370	540	70	0	20
2321	390	560	50	0	Tr
2322	390	560	50	Tr	0
2331	300	610	70	20	Tr
2332	280	640	80	0	0
3111	840	70	90	0	0
3112	780	80	100	0	40
3121	850	30	90	Tr	30
3122	810	90	90	Tr	10
3131	790	80	90	Tr	40
3132	800	70	90	Tr	40
3211	880	20	80	Tr	20
3212	850	30	90	0	30
3221	880	20	80	0	20
3222	920	10	70	0	0
3231	900	30	50	Tr	20
3232	900	30	50	0	20
3311	810	70	80	20	20
3312	830	30	80	Tr	60
3321	830	60	70	20	20
3322	780	110	70	Tr	40
3331	770	80	70	0	80
3332	770	90	70	Tr	70

*Id No. = Identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replication in the laboratory. QZ = quartz. FL = feldspar. MI = mica. HM = heavy minerals, such as epidote, zircon, etc. OP = opaques, primarily iron minerals.

Table E1: Mineralogy of the clay fraction for the taxonomic control section of soils in map unit 26B

Id. No.*	KK*	GI*	HIV*	VER*	QZ*	MI*	FL*
	g kg^{-1} of clay						
1111	690	20	180	60	50	0	0
1112	690	30	150	30	50	Tr	50
1121	660	30	200	60	50	Tr	0
1122	690	30	110	120	50	Tr	Tr
1131	600	30	200	70	50	Tr	50
1132	480	30	220	220	50	Tr	0
1211	800	10	100	40	50	0	0
1212	770	10	150	20	50	Tr	0
1221	730	10	150	60	50	Tr	Tr
1222	800	10	120	20	50	0	Tr
1231	740	10	80	70	50	Tr	50
1232	740	10	160	40	50	Tr	Tr
1311	720	30	150	50	50	0	Tr
1312	670	30	200	50	50	Tr	0
1321	730	20	100	50	50	0	50
1322	740	20	120	20	50	0	50
1331	730	20	150	50	50	0	0
1332	740	20	150	40	50	Tr	0
2111	670	20	100	110	50	50	0
2112	700	20	80	100	50	Tr	50
2121	790	20	40	100	50	Tr	Tr
2122	730	10	60	100	50	Tr	50
2131	700	20	100	130	50	Tr	0
2132	700	20	60	120	50	Tr	50
2211	790	10	50	100	50	0	0
2212	780	20	20	80	50	Tr	50
2221	810	10	70	60	50	Tr	0
2222	850	10	20	70	50	0	Tr

*Id No. = identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replications in the laboratory. KK = kaolinite. GI = gibbsite. HIV = hydroxy interlayered vermiculite. VER = vermiculite. QZ = quartz. MI = mica. FL = feldspar.

Table E2 - Mineralogy of the clay fraction for the taxonomic control section of soils in map unit 26B.

Id. No.*	KK*	GI*	HIV*	VER*	QZ*	MI*	FL*
	g kg^{-1} of clay						
2231	770	0	120	60	50	Tr	Tr
2232	750	10	40	150	50	Tr	0
2311	790	10	50	50	50	50	0
2312	750	10	100	40	50	Tr	50
2321	690	10	130	120	50	Tr	Tr
2322	790	10	100	50	50	Tr	Tr
2331	720	30	100	50	50	Tr	50
2332	600	10	90	200	50	Tr	50
3111	710	10	80	150	50	Tr	0
3112	710	10	100	130	50	Tr	0
3121	740	0	150	60	50	0	0
3122	710	10	30	200	50	Tr	Tr
3131	660	10	140	140	50	Tr	0
3132	680	10	130	130	50	0	0
3211	830	0	100	20	50	0	0
3212	720	0	200	30	50	0	Tr
3221	730	0	150	70	50	0	Tr
3222	790	0	130	30	50	0	0
3231	700	0	200	50	50	Tr	0
3232	750	0	150	50	50	Tr	Tr
3311	600	10	250	90	50	Tr	Tr
3312	660	10	200	80	50	Tr	0
3321	620	10	150	70	100	50	Tr
3322	580	10	160	150	50	Tr	50
3331	630	10	250	60	50	Tr	0
3332	760	20	150	20	50	0	0

*Id No. = identification number, the first digit = delineation, the second = site, the third = profile, and the fourth = replications in the laboratory. KK = kaolinite. GI = gibbsite. HIV = hydroxy interlayered vermiculite. VER = vermiculite. QZ = quartz. MI = mica. FL = feldspar.

Table F1: Mineralogy of the silt fraction for the taxonomic control section of soils in map unit 26B

Id. No.*	QZ*	KK*	MI*	FL*
	g kg^{-1} of silt			
111	530	310	100	60
112	760	70	100	70
113	570	290	100	40
121	420	430	150	Tr
122	550	350	100	Tr
123	560	390	50	Tr
131	670	150	150	30
132	460	490	50	Tr
133	470	480	50	Tr
211	540	310	50	100
212	500	400	50	50
213	610	280	50	60
221	310	390	100	200
222	500	410	50	40
223	560	290	100	50
231	480	380	100	40
232	600	350	50	Tr
233	430	450	100	20
311	430	470	100	Tr
312	360	470	150	20
313	440	460	100	Tr
321	630	300	50	20
322	540	240	100	120
323	640	340	0	20
331	650	220	100	30
332	810	90	100	Tr
333	770	180	50	Tr

*Id No. = identification number, the first digit = delineation, the second = site, and the third = profile. QZ = quartz. KK = kaolinite. MI = mica. FL = feldspar.

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Virginia's Agricultural Experiment Stations

1—Blacksburg
Virginia Tech, Main Station
Dairy, Poultry, and all other topics

2—Steeles Tavern
Shenandoah Valley Agricultural Experiment Station
Beef, Forages, Fruit, Insect and Pest Control, Sheep

3—Orange
Northern Piedmont Agricultural Experiment Station
Alfalfa, Corn, Crops, Small Grains

4—Winchester
Winchester Agricultural Experiment Station
Fruit, Insect and Pest Control

5—Middleburg
Middleburg Agricultural Experiment Station
Beef, Forages

6—Warsaw
Eastern Virginia Agricultural Experiment Station
Field Crops, Insect and Pest Control

7—Holland Station, Suffolk
Tidewater Agricultural Experiment Station
Corn, Peanuts, Pest Control, Small Grains, Soybeans, Swine

8—Blackstone
Southern Piedmont Agricultural Experiment Station
Forages, Horticulture Crops, Small Grains, Tobacco, Turfgrass

9—Critz
Reynolds Homestead Agricultural Experiment Station
Aquaculture, Forestry, Wildlife

10—Glade Spring
Southwest Virginia Agricultural
Experiment Station
Beef, Burley Tobacco, Sheep

11—Hampton
Virginia Seafood Agricultural Experiment Station
Seafood

12—Virginia Beach
Hampton Roads Agricultural Experiment Station
Ornamentals, Vegetables, Insect and Pest Control

13—Painter
Eastern Shore Agricultural Experiment Station
Fruit, Field Crops, Herbs, Insect and Pest Control, Vegetables