

**Soil Survey
Laboratory Data and
Descriptions for
Some Soils of**

Soil survey investigations reports already published:

SSIR No. 1 Soil Survey Laboratory Methods and Procedures for
Collecting Soil Samples

Soil Survey Laboratory Data and Descriptions for
Some Soils of:

SSIR No. 2	North Dakota
SSIR No. 3	Iowa
SSIR No. 4	Kansas
SSIR No. 5	Nebraska
SSIR No. 6	Arkansas, Louisiana, and Missouri
SSIR No. 7	Montana
SSIR No. 8	Wyoming
SSIR No. 9	Minnesota
SSIR No. 10	Colorado
SSIR No. 11	Oklahoma
SSIR No. 12	Puerto Rico and the Virgin Islands
SSIR No. 13	Mississippi
SSIR No. 14	Kentucky
SSIR No. 15	Tennessee
SSIR No. 16	North Carolina, South Carolina, and Georgia
SSIR No. 17	Wisconsin
SSIR No. 18	Indiana
SSIR No. 19	Illinois
SSIR No. 20	New England States
SSIR No. 21	A Toposequence of Soils in Tonalite Grus in the Southern California Peninsular Range

Soil Survey Laboratory Data and Descriptions for

Some Soils of:

SSIR No. 22	Alabama and Florida
SSIR No. 23	Nevada
SSIR No. 24	California
SSIR No. 25	New York

Soil Survey Investigations Report No. 26

Soil Survey Laboratory Data and Descriptions for Some Soils of...

... NEW JERSEY

August 1974

SOIL CONSERVATION SERVICE • U.S. DEPARTMENT OF AGRICULTURE
In cooperation with
NEW JERSEY AGRICULTURAL EXPERIMENT STATION • RUTGERS UNIVERSITY

METHODS CODE SYMBOLS, SOIL SURVEY LABORATORIES

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| <p>1. SAMPLE COLLECTION AND PREPARATION</p> <p>A. Field sampling</p> <ol style="list-style-type: none"> 1. Site selection 2. Soil sampling <ol style="list-style-type: none"> a. Stony soils <p>B. Laboratory preparation</p> <ol style="list-style-type: none"> 1. Standard (airdry) <ol style="list-style-type: none"> a. Square-hole 2-mm sieve b. Round-hole 2-mm sieve 2. Field moist <p>2. CONVENTIONS</p> <p>A. Size-fraction base for reporting</p> <ol style="list-style-type: none"> 1. <2-mm 2. < size specified <p>B. Data sheet symbols</p> <p>tr: trace, not measurable by quantitative procedure used or less than reportable amount</p> <p>- : analysis run but none detected</p> <p>blank: analysis not run</p> <p>nd: analysis not run</p> <p>< : less than reported amount or none present</p> <p>3. PARTICLE-SIZE ANALYSES</p> <p>A. Particles <2-mm (pipet method)</p> <ol style="list-style-type: none"> 1. Airdry samples <ol style="list-style-type: none"> a. Carbonate and noncarbonate clay 2. Moist samples <ol style="list-style-type: none"> a. Carbonate and noncarbonate clay <p>B. Particles >2-mm</p> <ol style="list-style-type: none"> 1. Weight estimates <ol style="list-style-type: none"> a. By field and laboratory weighing <p>4. FABRIC-RELATED ANALYSES</p> <p>A. Bulk density</p> <ol style="list-style-type: none"> 1. Saran-coated clods <ol style="list-style-type: none"> a. Field state b. Airdry f. 1/3-bar desorption III g. 1/10-bar desorption h. Ovendry 3. Cores <ol style="list-style-type: none"> a. Field moist <p>B. Water retention</p> <ol style="list-style-type: none"> 1. Pressure-plate extraction | <p>4. FABRIC RELATED ANALYSES (con.)</p> <p>(1/3 or 1/10-bar)</p> <ol style="list-style-type: none"> a. Sieved samples b. Soil pieces c. Natural clods d. Cores <p>2. Pressure membrane extraction (15-bars)</p> <ol style="list-style-type: none"> a. Field-moist samples <p>4. Field state</p> <p>C. Water-retention difference</p> <ol style="list-style-type: none"> 1. 1/3-bar to 15-bars 2. 1/10-bar to 15-bars <p>D. Linear extensibility</p> <ol style="list-style-type: none"> 1. Dry to moist <p>5. ION-EXCHANGE ANALYSES</p> <p>A. Cation-exchange capacity</p> <ol style="list-style-type: none"> 1. NH_4OAc, pH 7.0 <ol style="list-style-type: none"> a. Direct distillation b. Displacement distillation 3. Sum of cations <ol style="list-style-type: none"> a. Acidity by $\text{BaCl}_2\text{-TEA}$, pH 8.2; bases by NH_4OAc, pH 7.0 <p>B. Extractable bases</p> <ol style="list-style-type: none"> 1. NH_4OAc extraction <ol style="list-style-type: none"> a. Uncorrected 4. NH_4OAc, pH 7.0 (modified) <ol style="list-style-type: none"> a. Uncorrected <p>C. Base saturation</p> <ol style="list-style-type: none"> 3. Sum of cations <p>6. CHEMICAL ANALYSES</p> <p>A. Organic carbon</p> <ol style="list-style-type: none"> 1. Acid-dichromate digestion <ol style="list-style-type: none"> a. FeSO_4 titration <p>B. Nitrogen</p> <ol style="list-style-type: none"> 1. Kjeldahl digestion <ol style="list-style-type: none"> a. Ammonia distillation 2. Semimicro Kjeldahl <ol style="list-style-type: none"> a. Ammonia distillation <p>C. Iron</p> <ol style="list-style-type: none"> 1. Dithionite extraction <ol style="list-style-type: none"> a. Dichromate titration 5. Sodium pyrophosphate extraction <ol style="list-style-type: none"> a. Atomic absorption <p>E. Calcium carbonate</p> <ol style="list-style-type: none"> 1. HCl treatment <ol style="list-style-type: none"> a. Gas volumetric | <p>6. CHEMICAL ANALYSES (con.)</p> <ol style="list-style-type: none"> c. Weight loss <p>G. Aluminum</p> <ol style="list-style-type: none"> 5. Sodium pyrophosphate extraction <ol style="list-style-type: none"> a. Atomic absorption <p>H. Extractable acidity</p> <ol style="list-style-type: none"> 1. $\text{BaCl}_2\text{-triethanolamine I}$ <ol style="list-style-type: none"> a. Back-titration with HCl 2. $\text{BaCl}_2\text{-triethanolamine II}$ <ol style="list-style-type: none"> a. Back-titration with HCl <p>N. Calcium</p> <ol style="list-style-type: none"> 2. NH_4OAc extraction <ol style="list-style-type: none"> b. Oxalate-permanganate I d. Oxalate-cerate <p>O. Magnesium</p> <ol style="list-style-type: none"> 2. NH_4OAc extraction <ol style="list-style-type: none"> a. EDTA-alcohol separation b. Phosphate titration c. Gravimetric, $\text{Mg}_2\text{P}_2\text{O}_7$ <p>F. Sodium</p> <ol style="list-style-type: none"> 2. NH_4OAc extraction <ol style="list-style-type: none"> a. Flame photometry <p>Q. Potassium</p> <ol style="list-style-type: none"> 2. NH_4OAc extraction <ol style="list-style-type: none"> a. Flame photometry <p>7. MINERALOGY</p> <p>A. Instrumental analysis</p> <ol style="list-style-type: none"> 1. Preparation <ol style="list-style-type: none"> b. Organic-matter removal c. Iron removal d. Particle-size fractionation 2. X-ray diffraction <ol style="list-style-type: none"> a. Thin film on glass, solution 3. Differential thermal analysis <p>8. MISCELLANEOUS</p> <p>C. pH</p> <ol style="list-style-type: none"> 1. Soil suspensions <ol style="list-style-type: none"> a. Water dilution b. Saturated paste c. KCl e. CaCl_2 <p>D. Ratios and estimates</p> <ol style="list-style-type: none"> 1. To total clay 3. Ca to Mg (extractable) |
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UNCODED METHODS, RUTGERS UNIVERSITY

<u>Property</u>	<u>Units</u>	<u>Method</u>	<u>Ref.--Am. Soc. of Agron., No. 9, Methods of Soil Analysis</u>
Bulk density	g/cc	Soil cores, 3x3 in. taken at or slightly below field capacity as in 4A3a above.	Part 1, Chapter 40
Water retention bars or atmos.	Pct. oven dry (105° C) wt.	Saturated soil cores equilibrated at indicated suction.	
0.02,0.06,0.10,0.33		On tension table using asbestos membrane, In pressure membrane apparatus.	Part 1, Chapters 8 and 21 Part 1, Chapter 8
1.0		Saturated crushed soil sample equilibrated at indicated suction.	
2.0,6.0,15		In pressure membrane apparatus.	Part 1, Chapter 8
Available water	In. of water per in. of soil	(Pct. water at field capacity — Pct. water at 15 bar) x bulk density	Part 1, Chapter 19
Field capacity	Pct. (wt.)	Water content of field samples 24 to 48 hrs. after wetting of whole soil profile by rainfall.	Part 1, Chapter 19
Hydraulic conductivity	In. per hr.	Constant head (1 in. water) "permeameter" using saturated cores and 30 min. measurement periods until rate (V/T) becomes constant.	Part 1, Chapter 19
Porosity:	Pct. (vol.)		Part 1, Chapter 21
Noncapillary		Pct. (vol.) total pore space—pct. (vol.) water at 0.06 bar tension	
Capillary		Pct. (vol.) total pore space—pct. (vol.) noncapillary porosity	
Total		Pct. (vol.) water retained at 0 bars suction: saturated	
Aggregate stability		Yoder method, 0.5 mm lower limit	Soil Sci. 1949. Vol. 68(1)

PREFACE

The Soil Survey Investigations Report (SSIR) series was established to preserve and make available technical information resulting from soil survey investigations. SSIR No. 1, "Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples," revised April 1972, describes in detail the methods used in the soil survey laboratories. One report involves a single specific study. Other reports in the series contain pedon descriptions and data from the individual states and Puerto Rico and the Virgin Islands. The entire series is listed on the inside front cover.

This report contains pedon descriptions and data obtained principally from 1955 to 1965. The majority of laboratory analyses were conducted at soil survey laboratories in Beltsville, Maryland, and Lincoln, Nebraska. An additional large number of field and laboratory physical analyses were done by the Soils and Crops Department, New Jersey Agricultural Experiment Station, Rutgers University, New Brunswick.

Laboratory data for different soils cannot always be compared without allowance for the method. Methods are indexed by code or footnote in data sheet column headings and are identified briefly on the page opposite this Preface. Detailed explanations of coded procedures are in SSIR No. 1. Procedures used at Rutgers University can be found in cited publications.

Many of the soil descriptions published herein were prepared as working documents, not necessarily for publication. Some contain unusually detailed information pertinent to specific soil survey investigations. Such information, including older concepts of soil series, relationships among pedons, and field estimates of properties, is useful in a publication of this type. Editing is, therefore, minimal with emphasis toward preservation of descriptive data.

Many pedons no longer represent the soil series with which they were originally identified. All were classified during the period 1970 to 1974 and were checked against series classification as of December 1973. Some series names changed and are footnoted where the original name carries useful connotations. Pedons barely exceeding the limits of recognized series are designated as taxadjuncts but those with large departures are classified only to the family level. The latter are listed with the most closely related series in the geographical and series indexes. In the taxonomic index and in the body of the text, they are arranged by taxonomic unit.

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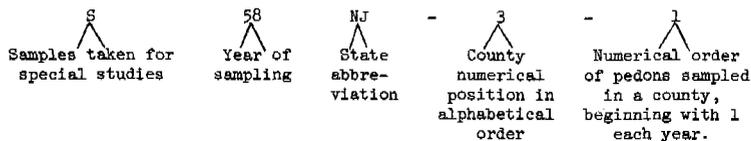
County	Soil Series	Soil Survey No. ¹ / ₂	Classification	Page	County	Soil Series	Soil Survey No. ¹ / ₂	Classification	Page		
Burlington	Evesboro	S58NJ-3-4	Quartzipsamment	27	Gloucester	Not designated	S58NJ-8-6	Hapludalf	19		
	Evesboro	S58NJ-3-5	Quartzipsamment	29		(sampled as Aura) ² / ₃					
	Not designated	S59NJ-3-1	Hapludalf	3		Downer	S57NJ-8-1	Hapludult	45		
	(sampled as Freehold) ² / ₃					Downer	S57NJ-8-2	Hapludult	47		
	Freehold	S56NJ-3-2	Hapludult	75		Downer	S57NJ-8-3	Hapludult	49		
	Freehold	S56NJ-3-1	Hapludult	41		Downer	S58NJ-8-7	Hapludult	55		
	taxadjunct					Westphalia	S59NJ-8-1	Hapludult	95		
	Galestown	S58NJ-3-1	Hapludult	101		taxadjunct					
	Galestown	S58NJ-3-2	Hapludult	103		Not designated	S60NJ-8-1	Hapludalf	9		
	Not designated	S58NJ-3-3	Hapludalf	13		(sampled as Westphalia) ² / ₃					
Camden	(sampled as Galestown) ² / ₃				Mercer	Matapeake	S57NJ-11-1	Hapludult	81		
	Hammonton	S61NJ-3-1	Hapludult	87		taxadjunct					
	Westphalia	S59NJ-3-2	Hapludult	97		Not designated	S60NJ-11-1	Hapludalf	23		
	taxadjunct					(sampled as Woodstown) ² / ₃					
	Not designated	S60NJ-4-3	Eutrochrept	33		Middlesex	Matapeake	S58NJ-12-1	Hapludult	85	
	(sampled as Downer) ³ / ₄						Matapeake	S57NJ-12-1	Hapludult	43	
	Not designated	S61NJ-4-3	Dystrochrept	31			taxadjunct				
	(sampled as Hammonton) ³ / ₄						Matapeake	S57NJ-12-3	Hapludult	83	
	Westphalia	S59NJ-4-1	Hapludult	63			taxadjunct				
	taxadjunct						Mattapex	S57NJ-12-2	Hapludult	89	
Not designated	S60NJ-4-1	Hapludalf	5	taxadjunct							
(sampled as Westphalia) ² / ₃				Mattapex	S57NJ-12-4		Hapludalt	91			
Not designated	S60NJ-4-2	Hapludalf	7	taxadjunct							
(sampled as Westphalia) ² / ₃				Mattapex	S58NJ-12-2		Hapludult	93			
Delaware	Downer	S58NJ-5-1	Hapludult	51	Monmouth	taxadjunct					
	Downer	S58NJ-5-2	Hapludult	53		Collington	S61NJ-13-1	Hapludult	71		
	Downer	S59NJ-5-1	Hapludult	57		Collington	S61NJ-13-2	Hapludult	73		
	Downer	S58NJ-5-4	Hapludult	99		Colts Neck	S59NJ-13-3	Rhodudult	37		
	taxadjunct					taxadjunct					
	Evesboro	S58NJ-5-3	Quartzipsamment	25		Colts Neck	S59NJ-13-4	Rhodudult	35		
	Downer	S59NJ-6-1	Hapludult	59		taxadjunct					
	Sassafras	S58NJ-6-1	Hapludult	61		Not designated	S59NJ-13-2	Hapludalf	15		
	taxadjunct					(sampled as Colts Neck) ² / ₃					
	(sampled as Aura) ² / ₃					Not designated	S59NJ-13-6	Hapludalf	21		
Gloucester	Aura	S58NJ-8-2	Hapludult	65	(sampled as Colts Neck) ² / ₃						
	Aura	S58NJ-8-3	Hapludult	67	Freehold	S57NJ-13-1	Hapludult	77			
	Aura	S58NJ-8-5	Hapludult	69	Freehold	S59NJ-13-5	Hapludult	79			
	Aura	S58NJ-8-1	Hapludult	39	Not designated	S59NJ-13-1	Hapludalf	11			
	taxadjunct				(sampled as Freehold)						
	Not designated	S58NJ-8-4	Hapludalf	17							
	(sampled as Aura) ² / ₃										

Footnotes are at the end of the soil series index.

SOIL SERIES INDEX

Series	Soil Survey No. ^{1/}	Classification	Page	Series	Soil Survey No. ^{1/}	Classification	Page
Aura	S58NJ-8-2	Hapludult	65	Not designated	S59NJ-13-1	Hapludalf	11
Aura	S58NJ-8-3	Hapludult	67	(sampled as Freehold) ^{2/}			
Aura	S58NJ-8-5	Hapludult	69	Galestown	S58NJ-3-1	Hapludult	101
Aura	S58NJ-8-1	Hapludult	39	Galestown	S58NJ-3-2	Hapludult	103
taxadjunct				Not designated	S58NJ-3-3	Hapludalt	13
Not designated	S58NJ-8-4	Hapludalf	17	(sampled as Galestown) ^{2/}			
(sampled as Aura) ^{2/}				Hamonton	S61NJ-3-1	Hapludult	87
Not designated	S58NJ-8-6	Hapludalf	19	Not designated	S61NJ-4-3	Dystrochrept	31
(sampled as Aura) ^{2/}				(sampled as Hamonton) ^{3/}			
Collington	S61NJ-13-1	Hapludult	71	Matapeake	S58NJ-12-1	Hapludult	85
Collington	S61NJ-13-2	Hapludult	73	Matapeake	S57NJ-11-1	Hapludult	81
Colts Neck	S59NJ-13-3	Rhodudult	37	taxadjunct			
taxadjunct				Matapeake	S57NJ-12-1	Hapludult	43
Colts Neck	S59NJ-13-4	Rhodudult	35	taxadjunct			
taxadjunct				Matapeake	S57NJ-12-3	Hapludult	83
Not designated	S59NJ-13-2	Hapludalf	15	taxadjunct			
(sampled as Colts Neck) ^{2/}				Mattapex	S57NJ-12-2	Hapludult	89
Not designated	S59NJ-13-6	Hapludalf	21	taxadjunct			
(sampled as Colts Neck) ^{2/}				Mattapex	S57NJ-12-4	Hapludult	91
Downer	S58NJ-5-1	Hapludult	51	taxadjunct			
Downer	S58NJ-5-2	Hapludult	53	Mattapex	S58NJ-12-2	Hapludult	93
Downer	S59NJ-5-1	Hapludult	57	taxadjunct			
Downer	S59NJ-6-1	Hapludult	59	Sassafras	S58NJ-6-1	Hapludult	61
Downer	S57NJ-8-1	Hapludult	45	taxadjunct			
Downer	S57NJ-8-2	Hapludult	47	Westphalia	S59NJ-3-2	Hapludult	97
Downer	S57NJ-8-3	Hapludult	49	taxadjunct			
Downer	S58NJ-8-7	Hapludult	55	Westphalia	S59NJ-4-1	Hapludult	63
Downer	S58NJ-5-4	Hapludult	99	taxadjunct			
taxadjunct				Westphalia	S59NJ-8-1	Hapludult	95
Not designated	S60NJ-4-3	Eutrochrept	33	taxadjunct			
(sampled as Downer) ^{3/}				Not designated	S60NJ-4-1	Hapludalf	5
Evesboro	S58NJ-5-3	Quartzipsamment	25	(sampled as Westphalia) ^{2/}			
Evesboro	S58NJ-3-4	Quartzipsamment	27	Not designated	S60NJ-4-2	Hapludalf	7
Evesboro	S58NJ-3-5	Quartzipsamment	29	(sampled as Westphalia) ^{2/}			
Freehold	S56NJ-3-2	Hapludult	75	Not designated	S60NJ-8-1	Hapludalf	9
Freehold	S57NJ-13-1	Hapludult	77	(sampled as Westphalia) ^{2/}			
Freehold	S59NJ-13-5	Hapludult	79	Not designated	S60NJ-11-1	Hapludalf	23
Freehold	S56NJ-3-1	Hapludult	41	(sampled as Woodstown) ^{2/}			
taxadjunct							
Not designated	S59NJ-3-1	Hapludalf	3				
(sampled as Freehold) ^{2/}							

^{1/} Soil numbers are coded as follows:



^{2/} Several New Jersey cultivated soils, sampled in old farming areas, have higher base saturation than morphologically similar Ultisols in adjacent woodlands. Difference in base status is attributed to heavy, protracted use of agricultural lime and fertilizers. The cultivated soils are now Alfisols and presumably were once Ultisols. They are arranged with the morphologically similar Ultisols and are listed without series names in this report. This footnote identifies them in the indexes.

^{3/} Pedons that are classified only to the family level because of major departures from current series, other than or in addition to the well documented cultural base status departures of New Jersey.

PEDON CLASSIFICATION: Typic Hapludalf; coarse-loamy, mixed, mesic
SOIL Series not designated SOIL Nos. 859A-3-1

LOCATION Burlington County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60125 - 60131

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments		
		Total			Sand					Silt				2A2 ≥ 2 Pct.	2-19 Pct.	19-76 Pct. of ← 76mm →
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)				
0-11	Ap	60.9	25.3	13.8	0.2	3.9	12.3	31.3	13.2	11.0	14.3	41.8	47.7	1.00	-	-
11-14	A2	65.1	25.2	9.7	0.2	4.0	12.5	34.1	14.3	11.8	13.4	45.4	50.8	1.00	-	-
14-22	B21t	60.9	20.2	18.9	0.3	3.2	11.0	32.6	13.8	9.6	10.6	42.1	47.1	1.00	-	-
22-30	B22t	69.7	13.8	16.5	0.4	4.4	13.8	38.3	12.8	7.3	6.5	42.0	56.9	1.00	-	-
30-35	B23t	69.7	10.4	14.6	0.4	5.6	15.4	41.9	11.7	5.7	4.7	41.7	58.0	1.00	-	-
35-41	ITC1	89.0	4.7	6.3	0.7	5.1	15.2	54.5	13.5	2.6	2.1	48.6	75.5	1.00	tr.	-
41-47	ITIC2	80.4	8.2	11.4	0.2	5.6	17.6	44.5	12.5	4.8	3.4	42.3	67.9	1.00	tr.	-

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/										pH		
					Bulk density g/cc	Water retained at suction of								Available water in/in	Field capacity Pct.	8Clc (1:1) KCl	8Clb (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar				
0-11	1.00	0.101	10		1.60	18.3	17.4	14.2	12.9	12.4	9.1	6.7	5.6	0.18	16.9	5.5	
11-14	0.20	0.030			1.65	19.5	15.0	14.5	12.6	11.5	6.5	4.7	3.9	0.19	15.3	6.0	
14-22	0.25				1.59	21.9	20.4	19.1	17.6	15.6	10.4	8.6	7.6	0.18	19.0	6.0	
22-30	0.06				1.67	20.6	18.7	17.3	15.4	13.7	8.8	7.6	6.7	0.20	18.8	6.0	
30-35	0.06				1.62	20.1	17.2	14.4	11.6	9.2	7.9	6.8	5.8	0.18	16.7	5.8	
35-41	0.06				1.55	19.2	13.3	11.8	9.2	7.0	3.5	3.0	2.6	0.16	13.2	5.9	
41-47	0.06				1.63	19.2	16.3	15.6	14.3	12.3	6.2	5.8	4.9	0.17	15.4	5.8	

Depth (in.)	Extractable bases 5B1a					6N2a Ext. acidity meq/100 g	CEC	6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum				OEC Sum	Ext iron	15-bar water		SC3 Sum cations Pct.	SC1 NH ₄ OAc Pct.
0-11	5.0	1.2	0.1	0.3	6.6	4.6	11.2			0.81	0.41		59	
11-14	3.2	1.0	0.1	0.1	4.4	1.9	6.3			0.65	0.40		70	
14-22	5.7	1.5	0.1	0.2	7.5	3.0	10.5			0.55	0.40		71	
22-30	4.8	1.2	0.1	0.2	6.3	2.7	9.0			0.03	0.40		70	
30-35	4.2	1.3	0.1	0.1	5.7	2.5	8.2			0.56	0.41		70	
35-41	1.9	0.7	0.1	0.1	2.8	1.0	3.8			0.60	0.40		74	
41-47	2.8	1.1	0.1	0.1	4.1	1.6	5.7			0.50	0.41		72	

Depth (in.)	Clay Fraction Analysis 7A1b-d									Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/					Methods referenced on methods code sheet.
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Porosity 8/			Plastic index	Aggregate stability 8/		
									Hydraulic conductivity in/hr	Non-capillary Pct.	Capillary Pct.			Total Pct.	
0-11										0.7	18.7	19.2	37.9	83	
11-14										0.06	12.4	24.6	37.0	14	
14-22										0.2	9.3	32.5	41.8	9	
22-30										0.1	9.3	31.1	40.4	10	
30-35										0.4	9.5	28.0	37.5	14	
35-41										3.3	19.2	21.8	41.0	11	
41-47										0.8	15.3	26.7	42.0	8	

Pedon Classification: Typic Hapludalf; coarse-loamy, mixed, mesic
 Soil: Series not designated 1/
 Soil No.: S59NJ-3-1
 Location: Burlington County, New Jersey. 300 feet west of Cropwell Road about 500 feet south of Highway
 S-73; long. 74°56'22"; lat. 39°54'15"; on photo CMU-7-49; orchard of Byron Roberts.
 Vegetation and land use: Peach orchard.
 Slope and land form: 1 percent.
 Drainage: Good.
 Permeability: Estimated, moderate.
 Parent material: Mt. Laurel-Wenonah formation of sands.
 Described by: Marco Markley

Horizon and
 Beltsville
 Lab. No.

Ap 60125	0 to 11 inches. Dark grayish brown (2.5Y 4/2) sandy loam; moderate medium subangular blocky structure; friable; many earthworm holes; abrupt smooth boundary. 10 to 12 inches thick.
A2 60126	11 to 14 inches. Light olive brown (2.5Y 5/4) sandy loam with a few blotches of dark yellowish brown (10YR 4/4); weak medium subangular blocky structure with weak platiness in lower few inches; very friable; many roots; many wormholes filled with material from Ap; abrupt smooth boundary. 4 to 6 inches thick.
B21t 60127	14 to 22 inches. Dark yellowish brown (10YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable, slightly sticky and plastic; many roots; some wormholes filled with Ap material; gradual wavy boundary. 6 to 8 inches thick.
B22t 60128	22 to 30 inches. Dark yellowish brown (10YR 4/4) sandy loam; moderate subangular blocky structure; very friable, slightly sticky and plastic; many roots; few wormholes filled with Ap material; gradual wavy boundary. 6 to 8 inches thick.
B23t 60129	30 to 35 inches. Dark yellowish brown (10YR 4/4) sandy loam with dark brown (7.5YR 4/4) interspersed; weak medium subangular blocky structure; very friable except the more reddish material which is slightly firm, nonsticky, nonplastic; common roots; abrupt smooth boundary. 4 to 6 inches thick.
IIC1 60130	35 to 41 inches. Light olive brown (2.5Y 5/4) and dark brown (7.5YR 4/4) sand; single grain and stratified; loose, except dark brown lenses and spheres which are slightly firm; few roots; abrupt smooth boundary.
IIIC2 60131	41 to 47 inches. Olive brown (2.5Y 4/4) and dark yellowish brown (10YR 4/4) sandy loam; weak medium subangular blocky structure; friable; few roots; stratified; abrupt smooth boundary.
IVC3 Not sampled	47 to 90 inches. Olive (5Y 5/3 to 5Y 4/3) fine and medium sand underlain by olive clay below 90 inches.

Notes: Colors refer to moist soil.

1/This pedon was sampled as Freehold, but the base saturation is raised to the Alfisol range by long term agricultural liming and fertilization. In other respects it is like the Freehold series except that the weighted clay content is 0.6 percent too low in the control section. Freehold is in the fine-loamy, mixed, mesic family of Typic Hapludults.

PEDON CLASSIFICATION: Typic Hapludalf; coarse-loamy, siliceous, mesic
SOIL Series not designated

SOIL Nos. 860NJ-4-1 LOCATION Camden County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60389 - 60395

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1		
		Total		Sand				Silt						2A2 ≥ 2	2-19	19-75
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)				
0-8	Ap	87.7	8.4	3.9	1.7	2.2	2.0	26.9	54.9	5.2	3.2	83.6	32.8	1.00	tr.	
8-14	A2	87.6	7.8	4.6	1.2	1.6	1.3	27.7	55.8	4.2	3.6	84.8	31.8	1.00	tr.	
14-22	B2t	74.7	6.4	18.9	0.8	1.4	1.1	23.3	48.1	3.8	2.6	73.2	26.6	1.00	tr.	
22-27	B3t	79.0	5.1	15.9	0.9	1.2	1.1	26.0	49.8	3.9	1.2	76.9	29.2	1.00	tr.	
27-32	C1	91.9	2.9	5.2	0.1	0.4	1.0	35.3	55.1	2.6	0.3	89.7	36.8	1.00	tr.	
32-42	IIIC2	75.3	12.8	11.9	-	0.6	0.8	22.5	51.4	6.4	6.4	77.9	23.9	1.00	tr.	
42-60	IIIC3	94.5	2.9	2.6	-	0.5	1.3	35.1	57.6	2.6	0.3	91.0	36.9	1.00	tr.	

Depth (in.)	5A1e Organic carbon	6B2a Nitrogen	C/N	Carbonate as CaCO ₃	Bulk density	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/								pH				
						Water retained at suction of									Avail- able water	Field capa- city	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar					
0-8	0.56	0.062	9		1.47	25.8	21.5	20.1	15.4	13.4	3.5	22.9	2.6	0.21	17.2	6.9		
8-14	0.08	0.023			1.54	19.1	15.7	14.6	11.2	9.4	3.0	1.8	1.5	0.24	16.9	6.2		
14-22	0.12				1.54	22.2	20.3	18.8	16.4	15.0	9.9	8.6	7.3	0.17	18.2	6.2		
22-27	0.10				1.49	24.5	20.7	18.4	14.3	12.9	8.9	7.8	6.6	0.15	16.9	6.1		
27-32	0.04				1.37	29.2	21.7	19.7	14.6	11.2	2.9	2.6	2.1	0.14	12.4	6.2		
32-42	0.04				1.46	24.4	21.8	19.2	12.2	19.5	7.9	6.6	5.6	0.13	14.1	6.1		
42-60					1.39	29.9	23.8	20.5	12.7	8.8	1.8	1.4	1.2	0.11	8.9	5.4		

Depth (in.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC	6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum				CEC Sum	Ext. Iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g													
0-8	4.8	0.1	tr.	0.1	5.0	1.2	6.2			1.59	0.67		81	
8-14	1.0	0.1	tr.	0.1	1.2	0.6	1.8			0.39	0.33		67	
14-22	3.5	0.2	tr.	0.1	3.8	2.3	6.1			0.32	0.39		62	
22-27	2.6	0.4	tr.	0.1	3.1	1.4	4.5			0.28	0.42		69	
27-32	1.0	0.2	tr.	tr.	1.2	0.4	1.6			0.31	0.40		75	
32-42	2.0	0.4	tr.	0.1	2.5	1.0	3.5			0.29	0.47		71	
42-60	0.6	0.2	tr.	tr.	0.8	0.4	1.2				0.46		67	

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers a/					Methods refer- enced on methods code sheet.	
	Mt.	Chl.	Vm.	Ml.	Int.	Qtz.	Kl.	Ginbaite	Porosity a/				Plastic index		Aggregate stabil- ity Pct.
									Hydrau- lic conduc- tivity in/hr	Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.			
0-8									1.6	8.2	31.6	39.8		76	
8-14									0.5	7.4	24.1	31.5		15	
14-22									0.2	7.5	31.2	38.7		10	
22-27									0.5	8.9	30.3	39.2		9	
27-32									3.7	13.8	29.7	43.5		5	
32-42									1.2	9.4	31.9	41.3		8	
42-60									5.5	10.4	33.6	44.0		7	

Pedon Classification: Typic Hapludalf; coarse-loamy, siliceous, mesic

Soil: Series not designated^{1/}

Soil No.: S60NJ-4-1

Location: Camden County, New Jersey. 250 feet southwest of Turnerville-Blackwood Terrace Road along Camden County line and 75 feet at right angles to hedgerow (approximately southeast); Camden County farms.

Vegetation and land use: Alfalfa, orchard grass.

Slope and land form: 3 to 4 percent.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Kirkwood formation, fine sand.

Described by: Marco Markley

Horizon and

Beltsville

Lab. No.

- Ap
60389 0 to 8 inches. Very dark grayish brown (2.5Y 3/2) very fine sand, light gray (10YR 6/1) dry; weak fine granular structure; friable; many roots; less than 1 percent rounded quartzose pebbles; 2 to 5 percent glauconite, common mica, few earthworms; pH 6.0; abrupt smooth boundary. 7 to 8 inches thick.
- A2
60390 8 to 14 inches. Pale brown (10YR 6/3) very fine sand; single grain; loose; containing discontinuous bands 1/4 to 1/2 inch thick, darker in color (10YR 5/8) and slightly finer textured; pH 6.8. 5 to 7 inches thick.
- AB
Not sampled 13 to 17 inches. Mixed A2 and B1 material, discontinuous over about 1/2 the pit.
- B2t
60391 17 to 22 inches. Yellowish brown (10YR 5/8) very fine sandy loam; moderate medium subangular blocky structure; friable; many roots; less than 1 percent of gravel; pH 6.8; clear smooth boundary. 6 to 12 inches thick.
- B3t
60392 22 to 27 inches. Yellowish brown (10YR 5/8) very fine sandy loam; weak medium subangular blocky structure; very friable; common roots; generally less than 1 percent of gravel but containing up to 3 inches strata of sand or gravel in places; clear smooth boundary. 4 to 6 inches thick.
- C1
60393 27 to 32 inches. Yellowish brown (10YR 5/6) very fine sand; mixed with paler colors; single grain; loose; few roots; less than 1 percent of gravel; pH 6.8; clear smooth boundary. 0 to 6 inches thick.
- IIC2
60394 32 to 42 inches. Yellowish brown (10YR 5/6) very fine sandy loam; massive; friable; few roots; less than 1 percent of gravel; pH 6.4; clear smooth boundary.
- IIIC3
60395 42 to 60 inches. Light brownish gray (10YR 6/2) very fine sand; single grain; loose; few roots; pH 4.6.

Notes: Colors refer to moist soil.

^{1/}

This pedon was sampled as a representative of the Westphalia series which is in the coarse-loamy, siliceous, mesic family of Ochreptic Hapludults. It differs in base saturation which has been raised by agricultural liming and fertilization, and in a slightly thicker argillic horizon.

PEDON CLASSIFICATION: Typic Hapludalf; coarse-loamy, siliceous, mesic
SOIL Series not designated

SOIL Nos. S60NT-4-2 LOCATION Camden County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60396 - 60401

Depth (In.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total			Sand					Silt				2A2 > 2 < 76 Pct.	2-19 Pct.	19-76 Pct.	
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (< 0.002)	Vary coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)					(2-0.1)
0-10	Ap	81.7	11.9	6.4	0.9	3.3	4.0	35.6	37.9	7.6	4.3	76.7	43.8	0.98	4		
10-18	A2	80.2	15.1	4.7	0.8	3.4	3.2	29.3	43.5	8.5	6.6	77.3	36.7	1.00	tr.		
18-22	B1t	74.8	13.6	11.6	0.8	2.8	2.7	29.0	39.5	7.7	5.9	72.5	35.3	0.98	4		
22-28	B2t	76.7	12.5	10.8	0.7	2.7	2.5	32.8	38.0	6.9	5.6	74.1	38.7	1.00	tr.		
28-33	B3t	78.2	11.0	10.8	0.6	1.7	1.4	40.3	34.2	5.7	5.3	76.6	44.0	0.98	3		
33-43	Cl	88.4	9.2	2.4	-	0.1	0.4	51.0	36.9	5.0	4.2	88.9	51.5	1.00	tr.		

Depth (In.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/								Available water in/in	Field capa- city Pct.	pH	
						Water retained at suctions of										8C1c (1:1) KCl	8C1e (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar				
0-10	0.55	0.061	9		1.46	27.3	24.0	22.7	16.3	13.7	5.0	3.7	3.3	0.23	19.5		6.0
10-18	0.08	0.028			1.59	20.3	16.6	15.2	11.7	8.2	3.1	2.0	1.6	0.21	15.0		6.4
18-22	0.10				1.54	22.1	18.3	17.0	14.3	11.5	6.2	5.0	4.2	0.19	16.6		6.4
22-28	0.06				1.48	23.3	18.1	15.1	11.1	9.5	6.1	5.2	4.2	0.17	15.4		6.4
28-33	0.04				1.43	22.4	13.5	16.2	12.3	10.4	6.0	4.9	4.1	0.15	14.9		6.5
33-43	0.04				1.33	25.4	21.4	17.6	10.1	8.4	2.1	1.5	1.2	0.14	11.6		6.2

Depth (In.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC	6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum				CEC Sum	Ext. Iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g													
0-10	3.2	0.7	0.1	0.2	4.2	2.5	6.7						63	
10-18	1.4	0.3	0.1	0.1	1.9	0.4	2.2						82	
18-22	2.0	0.7	0.1	0.2	3.0	1.4	4.4						68	
22-28	1.8	0.7	tr.	0.2	2.7	1.2	3.9						69	
28-33	1.8	0.8	tr.	0.1	2.7	1.0	3.8						74	
33-43	1.1	0.1	tr.	tr.	1.2	0.2	1.5						87	

Depth (In.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers a/					Methods refer- enced on methods code sheet.
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Hydrau- lic conduc- tivity in/hr	Porosity a/				
										Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.	Plastic index Pct.	
0-10									0.8	6.8	35.0	41.8		73
10-18									0.1	9.5	26.1	35.6		9
18-22									0.1	10.4	28.2	38.6		12
22-28									0.6	11.7	26.9	38.6		10
28-33									0.9	13.4	26.5	39.9		7
33-43									1.9	17.4	28.2	45.6		6

Pedon Classification: Typic Hapludalf; coarse-loamy, siliceous, mesic
 Soil: Series not designated
 Soil No.: S60NJ-4-2
 Location: Camden County, New Jersey. 75 feet from Blackwood Road, 100 feet from dirt road, northwest of Laurel Springs Road; Sam Bastianelli farm.
 Vegetation and land use: Used for vegetables; in winter cover crop at time of sampling.
 Slope and land form: 2 to 3 percent.
 Drainage: Well drained.
 Permeability: Moderate.
 Parent material: Kirkwood formation, fine sand.
 Described by: Marco Markley

Horizon and
 Beltsville
 Lab. No.

Ap 0 to 10 inches. Very dark grayish brown (2.5Y 3/2) loamy fine sand, light gray (10YR 6/1) dry; weak fine granular structure; very friable; many roots; few earthworms; 3 percent rounded quartzose pebbles; some glauconite; abrupt smooth boundary. 9 to 11 inches thick.
 60396
 A2 10 to 18 inches. Pale brown (10YR 6/3) loamy fine sand; weak medium granular structure; very friable; common roots; less than 1 percent rounded quartzose pebbles up to 2 inches in diameter; containing irregular bands 1/8 inch thick and several spheroidal balls, of material colored like the B horizon; abrupt smooth boundary. 5 to 10 inches thick.
 60397
 B1t 18 to 22 inches. Yellowish brown (10YR 5/4) and pale brown (10YR 5/3) very fine sandy loam; weak medium granular structure; very friable; many roots; 3 percent quartzose pebbles; clear wavy boundary. 3 to 5 inches thick.
 60398
 B2t 22 to 28 inches. Yellowish brown (10YR 5/6) very fine sandy loam; weak medium subangular blocky structure; friable; many roots; mica common; few quartzose pebbles, few cobbles; clear wavy boundary. 3 to 7 inches thick.
 60399
 B3t 28 to 33 inches. Yellowish brown (10YR 5/6) very fine sandy loam; weak fine granular structure; very friable; many roots; mica common; abrupt wavy boundary. 3 to 12 inches thick.
 60400
 C1 33 to 43 inches. Pale brown (10YR 6/3) fine sand; single grain; loose; common roots; mica common; 5 percent rounded quartzose pebbles and cobbles in pockets; numerous small yellowish brown spheres; abrupt wavy boundary. 2 to 12 inches thick.
 60401
 C2 43 to 46 inches. Yellowish brown (10YR 5/4) fine sandy loam; massive; friable; few roots; mica common; abrupt discontinuous boundary.
 Not sampled
 C3 46 to 80 inches. Pale brown (10YR 6/3) fine sand; single grain; loose.
 Not sampled

Notes: Colors refer to moist soil.

¹/This pedon was sampled as a representative of the Westphalia series which is in the coarse-loamy, siliceous, mesic family of Ochreptic Hapludults. It differs in base saturation which has been raised by agricultural liming and fertilization, and in a slightly thicker argillic horizon.

FEDON CLASSIFICATION: Typic Hapludalf; coarse-loamy, siliceous, mesic
SOIL Series not designated SOIL Nos. 860NJ-8-1 LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 60402 - 60407

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total		Sand					Silt					2A2 ≥ 2 < 76 Pct.	2-19 Pct.	19-76 Pct.	
		Sand (2-0.05) (0.05-0.002)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02 (0.02-0.002)	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
0-8	Ap	79.3	15.3	5.4	1.7	3.4	4.0	15.2	55.0	8.7	6.6	76.6	24.3	1.00	tr.		
8-18	A2	73.1	19.7	7.2	0.3	1.1	1.1	11.2	59.4	9.6	10.1	79.5	13.7	1.00	tr.		
18-27	B2t	66.6	17.4	16.0	0.2	0.8	0.9	10.6	54.1	8.0	9.4	72.1	12.5	1.00	tr.		
27-33	B3t	71.2	14.4	14.4	0.1	0.5	0.5	8.3	61.8	7.1	7.3	76.8	9.4	1.00	tr.		
33-44	C1	89.0	6.4	4.6	-	0.1	0.1	6.9	81.9	4.0	2.4	92.5	7.1	1.00	tr.		
44-60	C2	86.8	7.0	6.2	-	-	-	0.1	2.8	83.9	4.5	2.5	90.9	2.9	1.00	tr.	

Depth (in.)	6Aa Organic carbon Pct.	6Ba Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										pH				
						Water retained at suctions of											Avail- able water in/in	Field capacity Pct.	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar							
0-8	0.74	0.086	9		1.49	22.0	20.4	19.0	15.5	14.4	5.4	3.8	3.2	0.22	18.0		4.9			
8-18	0.10	0.031			1.56	19.9	17.0	16.5	14.4	12.1	5.1	3.7	2.8	0.22	17.5		5.8			
18-27	0.10				1.46	24.0	21.5	20.9	18.5	17.0	9.8	8.0	6.6	0.17	18.1		6.0			
27-33	0.08				1.42	25.9	23.1	21.7	17.6	15.9	8.5	6.9	6.3	0.14	16.1		5.8			
33-44	0.04				1.34	33.2	31.0	29.5	24.6	22.3	3.6	2.4	2.1	0.14	12.3		5.8			
44-60	0.12				1.39	32.1	29.9	28.7	24.0	18.4	4.4	3.4	2.8	0.14	12.8		5.8			

Depth (in.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC		8G1d Ext. Al	Ratios to clay 5D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations			CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g														
0-8	1.3	0.2	0.1	0.4	2.0	4.7	6.7					1.24	0.59		30
8-18	1.6	0.3	0.1	0.1	2.1	1.0	3.1					0.43	0.39		68
18-27	2.9	0.7	tr.	0.1	3.7	2.1	6.0					0.37	0.41		63
27-33	2.6	0.8	tr.	tr.	3.4	1.8	5.3					0.37	0.44		66
33-44	1.2	0.3	tr.	-	1.5	0.2	1.7					0.37	0.46		88
44-60	1.2	0.3	tr.	tr.	1.5	0.2	1.7					0.27	0.45		88

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers a/					Methods referenced on methods code sheet.	
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Hydraulic conductivity in/hr	Porosity a/			Plastic index Pct.		Aggregate stability Pct.
	7A2 X-ray				7A3					Non-capillary Pct.	Capillary Pct.	Total Pct.			
0-8									0.4	10.5	30.0	40.5	86		
8-18									0.1	8.8	26.6	35.4	10		
18-27									0.3	9.5	31.4	40.9	6		
27-33									0.9	7.9	32.7	40.6	6		
33-44									1.5	5.9	41.3	47.2	6		
44-60									1.4	6.1	41.5	57.6	5		

Pedon Classification: Typic Hapludalf; coarse-loamy, siliceous, mesic

Soil: Series not designated ^{1/}

Soil No.: S60NJ-8-1

Location: Gloucester County, New Jersey. 100 feet east and 500 feet north of Damminger house.

Vegetation and land use: Peach orchard, about 10 years old; no cover crop.

Slope and land form: 1 percent.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Kirkwood formation, fine sand.

Described by: Marco Markley

Horizon and

Beltsville

Lab. No.

- Ap 60402 0 to 8 inches. Very dark grayish brown (2.5Y 3/2) loamy very fine sand, light gray (10YR 6/1) dry; weak fine granular structure, in places weak thin platy between 5 and 6 inches; friable; many roots; 1 percent rounded quartzose pebbles; about 3 percent glauconite; mica common; few earthworms; clear smooth boundary. 7 to 9 inches thick.
- A2 60403 8 to 14 inches. Light olive brown (2.5Y 5/4) very fine sandy loam; massive; very friable; common roots; less than 1 percent rounded quartzose pebbles; glauconite content low; mica common; two discontinuous bands 1/4 to 1/2 inch thick, of slightly darker color and slightly finer texture; abrupt wavy boundary. 6 to 11 inches thick.
- B1 Not sampled 14 to 18 inches. Light olive brown (2.5Y 5/4) very fine sandy loam; weak fine granular structure; very friable; abrupt smooth boundary. 0 to 6 inches thick.
- B2t 60404 18 to 27 inches. Yellowish brown (10YR 5/8) very fine sandy loam; weak medium subangular blocky structure; friable; many roots; scattered fragments of ironstone; little glauconite; mica common; clear smooth boundary. 8 to 16 inches thick.
- B3t 60405 27 to 33 inches. Yellowish brown (10YR 5/6) very fine sandy loam; very weak subangular blocky structure; very friable; many roots; little glauconite; mica common; abrupt smooth boundary. 4 to 6 inches thick.
- C1 60406 33 to 44 inches. Pale yellow (2.5Y 7/4) finely banded very fine sand; single grain; loose; few roots; little glauconite; mica common. 12 to 16 inches thick.
- C2 60407 44 to 60 inches. Brownish yellow (10YR 6/8) finely banded, loamy very fine sand; single grain; very friable; few roots; little glauconite; mica common.
- C3 Not sampled 60 to 98 inches. Yellowish brown (10YR 5/8) finely banded, loamy very fine sand; single grain; very friable; few roots.

Notes: Colors refer to moist soil.

^{1/}This pedon was sampled as a representative of the Westphalia series which is in the coarse-loamy, siliceous, mesic family of Ochreptic Hapludults. It differs in base saturation which has been raised by long term agricultural liming and fertilization, and in slightly thicker argillic horizon.

PEDON CLASSIFICATION: Typic Hapludalf; fine-loamy, mixed, mesic
sandy Series not determined

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60330 - 60336

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1			
		Total		Clay (≤ 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Sand			Silt		Int. II (0.2-0.02)		(2-0.1)	2A2	2-19	19-76
		Sand (2-0.05)	Silt (0.05-0.002)				Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)				Pct.	Pct. of $\leq 76\text{mm}$	
0-9	Ap	65.0	27.3	7.7	0.3	8.5	26.7	22.0	7.5	15.0	12.3	31.6	57.5	1.00	tr.		
9-12	B1t	53.5	30.3	16.2	0.2	6.5	20.6	19.2	7.0	13.7	16.6	28.5	46.5	1.00	tr.		
12-18	B21t	58.8	20.8	20.4	0.2	6.4	21.9	22.5	7.8	9.5	11.3	27.4	51.0	1.00	-		
18-25	B22t	58.7	21.4	19.9	0.2	5.6	21.3	23.0	8.6	11.3	10.1	29.7	50.1	1.00	-		
25-29	B31t	77.6	8.2	14.2	0.2	9.4	33.7	28.7	5.6	5.2	3.0	21.1	72.0	1.00	-		
29-35	B32	80.9	7.4	11.7	0.2	9.3	33.5	31.2	6.7	4.1	3.3	22.6	74.2	1.00	-		
35-81	C	82.7	8.9	8.4	0.5	14.0	37.0	26.4	4.8	4.3	4.6	18.2	77.9	1.00	-		

Depth (in.)	6A1a Organic carbon	6B2a Nitrogen	C/N	Carbonate as CaCO ₃	Bulk density	Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/										Available water	Field capa- city	pH	
						Water retained at suction of												8C1c (1:1)	8C1a (1:1)
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar	in/in	Pct.				
0-9	0.39	0.047	8		1.63	19.1	17.1	15.7	14.0	12.6	6.7	5.0	4.5	0.18	15.8		5.2		
9-12	0.24	0.041			1.70	19.4	18.0	17.2	16.3	15.4	10.4	8.3	7.1	0.18	17.5		5.4		
12-18	0.15				1.62	21.1	19.0	18.3	17.1	15.9	11.5	9.5	8.4	0.18	19.7		5.5		
18-25	0.12				1.64	19.6	18.1	17.3	16.1	15.4	11.0	9.0	8.1	0.17	18.4		5.4		
25-29	0.06				1.60	19.9	15.1	14.2	12.9	12.1	7.1	6.6	5.1	0.18	16.6		5.0		
29-35	0.06				1.57	20.9	20.5	17.8	13.2	12.1	6.3	5.3	5.0	0.13	13.3		4.8		
35-81	0.04				1.53	21.8	12.4	11.5	10.0	9.3	4.4	3.4	3.0	0.12	11.1		4.6		

Depth (in.)	Extractable bases 5B1a					6H2a Ext acidity	CEC		6G1d Ext Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	CEC Sum		Ext. iron	15-bar water	5C3 Sum cations Pct.		5C1 NH ₄ OAc Pct.	
	meq/100 g														
0-9	2.5	0.5	0.1	0.3	3.4	4.8	8.2				1.06	0.58		41	
9-12	4.6	0.7	0.1	0.2	5.6	4.2	9.8				0.60	0.44		57	
12-18	6.0	1.0	0.1	0.2	7.3	5.1	11.5				0.56	0.41		56	
18-25	5.6	1.0	0.2	0.1	6.9	4.4	10.4				0.52	0.41		58	
25-29	2.8	0.5	0.1	0.1	3.5	3.5	7.0				0.49	0.36		50	
29-35	2.8	0.5	0.2	0.1	3.6	4.1	7.7				0.66	0.43		47	
35-81	1.6	0.3	0.1	0.1	2.1	3.1	5.2				0.62	0.36		40	

Pedon Classification: Typic Hapludalf; fine-loamy, mixed, mesic

Soil: Series not designated

Soil No.: S59NJ-13-1

Location: Monmouth County, New Jersey. Peter Kolb vegetable field; 1/4 mile north of West Freehold, N.J. 200 feet west of blacktop road to Wemrock and 200 feet south of lane leading to Kolb farmhouse, in edge of parsnip field.

Vegetation and land use: Site presently planted to parsnips. Was planted to white potatoes continuously to 1933, then white potatoes, cover and vegetables to 1949. Since then vegetables with no crop cover. No lime for past 2 years.

Slope and land form: 1 percent.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Reworked material probably belonging to Red Bank formation.

Sampled by: N. A. Willits and K. P. Wilson

Horizon and
Beltsville
Lab. No.

Ap 60330	0 to 9 inches. Dark yellowish brown (10YR 4/4) sandy loam; weak subangular blocky structure parting to very weak fine granular; firm in place, friable when removed; few fine roots and pores; pH 5.4; clear smooth boundary. 8 to 12 inches thick.
B1t 60331	9 to 12 inches. Dark brown (7.5YR 4/4) sandy loam; slightly variegated by Ap and A2 mixture; weak medium or coarse subangular blocky structure; firm in place, friable when removed; few fine roots and pores; pH 5.8; clear smooth boundary. 2 to 3 inches thick.
B21t 60332	12 to 18 inches. Dark brown (7.5YR 4/4) sandy clay loam; moderate medium subangular blocky structure parting to weak fine granular structure; firm in place, moderately plastic; slight coatings or filling of ped surfaces, slightly redder; pH 5.6; clear smooth boundary. 5 to 8 inches thick.
B22t 60333	18 to 25 inches. Dark brown (7.5YR 4/4) fine sandy loam, grading toward reddish brown, but with more green than B21, slightly variegated; weak coarse subangular blocky structure; glauconite grains more noticeable than in B21 horizon; pH 5.8; clear smooth boundary. 6 to 10 inches thick.
B31t 60334	25 to 29 inches. Brown (7.5YR 5/4) sandy loam, grading toward reddish brown; massive, with few sandier lamellae; slightly firm in place but very friable when removed; fine to medium sand-size glauconite grains quite noticeable; pH 5.2; gradual wavy boundary. 3 to 6 inches thick.
B32 60335	29 to 35 inches. Brown (7.5YR 5/4) to strong brown (7.5YR 5/8) sandy loam variegated with dark green splotches; massive; friable; many 1/4 to 1/2 inch lamellae of more reddish, firmer, slightly finer textured sandy loam; glauconite grains evident; pH 5.0; clear smooth boundary. 4 to 8 inches thick.
C 60336	35 to 81 inches. Strong brown (7.5YR 5/8) to yellowish brown (10YR 5/8) loamy sand; massive, loose; glauconite evident; pH 5.0. Lens or ball of highly glauconitic clay loam encountered by boring at 6 feet. At from 8 to 9 feet, the glauconitic clay loam was fairly consistent with sand lenses minor.

Notes: Colors refer to moist soil unless indicated otherwise.

1/ This pedon is within the range of the Freehold series in all respects except base saturation which is elevated to the Alfisol range by heavy agricultural liming and fertilization. Freehold is in the fine-loamy, mixed, mesic family of Typic Hapludults.

PEDON CLASSIFICATION: Psammentic Hapludalf; sandy, siliceous, mesic

SOIL Series not designated SOIL Nos. **S58NJ-3-3** LOCATION **Burlington County, New Jersey**

SOIL SURVEY LABORATORY **Beltsville, Maryland**

LAB. Nos. **59211 - 59217**

Depth (in.)	Horizon	181b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments				
		Total				Sand				Silt				2A2 ≥ 2 Pct.	2-19 Pct.	19-76 Pct. of ← 76mm		
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Vary coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)					(2-0.1)	
0-10	Ap	89.7	6.0	4.3	0.7	11.7	30.2	36.2	10.9	3.7	2.3	32.6	78.8	1.00	-			
10-23	A2	91.7	4.2	4.1	0.7	13.9	33.9	35.2	8.0	2.3	1.9	25.8	83.7	1.00	-			
23-30	B2t	89.3	3.1	7.6	0.6	9.9	30.6	39.4	8.8	2.1	1.0	29.5	80.5	1.00	tr.			
30-38	B3	91.8	2.8	5.4	0.6	8.8	30.0	43.1	9.3	1.4	1.4	30.6	82.5	1.00	tr.			
38-42	C1	91.2	4.5	4.3	0.8	11.3	31.1	38.1	9.9	2.4	2.1	29.8	81.3	1.00	tr.			
42-48	IIIC2	83.2	8.4	8.4	1.0	13.0	27.0	32.2	10.0	3.8	4.6	29.1	73.2	1.00	-			
48-52	IIIC3	Not sampled																
52-60	IVC4	94.3	2.7	3.0	1.8	15.5	35.4	32.8	8.8	1.7	1.0	25.4	85.5	1.00	tr.			

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										pH			
					Bulk density g/cc	Water retained at suctions of								Avail- able water in/in	Field capa- city Pct.	8C1c (1:1) KCl	8C1a (1:1) H ₂ O	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar					
0-10	0.38	0.056	7	0.5	1.57	22.2	14.4	9.8	8.8	7.7	3.7	2.5	1.8	0.14	11.0		6.1	
10-23	0.07	0.018		0.6	1.63	21.0	11.3	6.7	5.6	5.0	2.9	2.1	1.5	0.15	10.8		6.0	
23-30	0.07	0.036		0.8	1.53	23.2	12.9	7.5	6.7	6.1	4.8	3.3	3.1	0.11	10.4		5.8	
30-38	0.05	0.034		0.7	1.49	23.1	11.7	6.8	5.2	4.6	3.3	2.8	2.4	0.11	9.7		4.6	
38-42	0.05			0.6	1.51	21.6	14.1	8.4	5.9	4.9	4.1	2.3	2.0	0.15	11.5		5.7	
42-48	0.09			1.0	1.54	20.3	13.2	9.8	7.9	6.0	5.7	4.4	3.5	0.12	11.3		5.7	
48-52	Not sampled																	
52-60	0.06			0.7	1.54	20.2	10.4	6.3	4.4	3.4	2.3	2.1	1.7	0.09	7.6		5.7	

Depth (in.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC 5A3a Sum cations	6D1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation		
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum				CEC Sum	Ext. Iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.	
	meq/100 g														
0-10	1.7	0.8	tr.	0.3	2.8	0.6	3.4			0.79	0.12	0.42		82	
10-23	1.0	0.7	tr.	0.1	1.8	0.4	2.2			0.54	0.15	0.37		82	
23-30	1.4	0.7	tr.	0.2	2.3	1.1	3.4			0.45	0.11	0.41		68	
30-38	1.2	0.6	tr.	0.2	2.0	0.6	2.6			0.48	0.13	0.44		77	
38-42	1.0	0.4	tr.	0.2	1.6	0.4	2.0			0.46	0.14	0.47		80	
42-48	1.4	0.8	tr.	0.2	2.4	1.1	3.5			0.42	0.12	0.42		68	
48-52	Not sampled														
52-60	0.8	0.5	tr.	0.2	1.5	0.6	2.1			0.70	0.23	0.57		71	

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/					Methods refer-	
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Hydrau- lic conduc- tivity in/hr	Porosity a/					Aggre- gate stabil- ity Pct.
										Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.	Plastic index Pct.		
0-10									1.0	17.6	14.1	31.7	N.P.	31	
10-23									0.6	18.7	18.3	37.0	N.P.	20	
23-30									1.3	21.7	19.8	41.5	N.P.	17	
30-38									3.8	21.9	17.5	39.4	N.P.	17	
38-42									1.2	15.3	21.3	36.6	N.P.	20	
42-48									1.3	16.1	20.4	36.5	N.P.	18	
48-52	Not sampled														
52-60									7.2	20.7	15.5	36.2	N.P.	24	

Pedon Classification: Psammentic Hapludalf; sandy, siliceous, mesic
 Soil: Series not designated ^{1/}
 Soil No.: S58NJ-3-3
 Location: Burlington County, New Jersey. Just south of Beverly, across road from the National cemetery;
 Versaci farm out from southeast corner of family garden.
 Vegetation and land use: Vegetable growing.
 Slope and land form: About 1 percent.
 Drainage: Somewhat excessively drained.
 Permeability: Rapid to very rapid.
 Parent material: Deep sands of the coastal plain.
 Physiographic position: Undulating Delaware River terrace, the site probably a wind deposit; elevation
 slightly under 30 feet.
 Described by: G. A. Quakenbush

Horizon and
 Beltsville
 Lab. No.

Ap 59211	0 to 10 inches. Very dark grayish brown (10YR 4/2) sand, grayish brown (10YR 5/2) dry; structureless; very friable; abrupt boundary.
A2 59212	10 to 23 inches. Yellowish brown (10YR 5/4) sand, light yellowish brown (10YR 6/4) dry; single grain; very friable; four strong brown (7.5YR 4/6) wavy bands present about 1/2 inch wide; sand grains darker than matrix color, sprinkled the soil; clear smooth boundary. 12 to 14 inches thick.
B2t 59213	23 to 30 inches. Strong brown (7.5YR 5/6) sand, yellowish brown (10YR 5/6) dry; massive with uneven fracture giving way to very weak subangular blocks; friable, nonsticky and nonplastic; sprinkling of darker grains present; gradual smooth boundary. 6 to 9 inches thick.
B3 59214	30 to 38 inches. Strong brown (7.5YR 5/6) with evident grayer grains and yellowish brown (10YR 5/6) dry; single grain; loose; gradual smooth boundary. 5 to 10 inches thick.
C1 59215	38 to 42 inches. Strong brown (7.5YR 5/6) with 40 percent (10YR) sand, yellowish brown (10YR 5/6) dry; single grain; loose; clear smooth boundary.
IIC2	42 to 48 inches. Variegated, moist about 50 percent (7.5YR) and 50 percent yellowish brown (10YR 5/6) loamy sand, brown (7.5YR 5/4) dry; uneven fracture; friable; clear wavy boundary.
IIIC3 Not sampled	48 to 52 inches. Mixed grains about 70 percent strong brown (7.5YR 5/6) and 30 percent dark brown (7.5YR 4/4) sand, strong brown (7.5YR 5/6) dry; single grain; loose; clear broken boundary. May be absent.
IVC4 59217	52 to 60 inches. Yellowish brown (10YR 5/6) sand, grading with depth to (2.5Y); single grain; loose.

Notes: Colors refer to moist soil unless indicated otherwise.

^{1/}This pedon was sampled as Galestown. Agricultural fertilization and liming are credited with raising the base saturation into the range of Alfisols. The Galestown series is in the sandy, siliceous, mesic family of Psammentic Hapludalts. In properties other than base saturation this pedon is like Galestown.

PEDON CLASSIFICATION: Ultic Hapludalf; coarse-loamy, mixed, mesic
SOIL Series not designated

SOIL Nos. S59NJ-13-2 LOCATION Monmouth County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60148 - 60152

Depth (In.)	Horizon	1B1b Size class and particle diameter (mm) 3A1													3B2 Cm	3B1 Coarse fragments		
		Total				Sand					Silt					2A2 > 2 Pct.	2-19 Pct.	19-76 Pct. of < 76mm
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)	(2-0.1)					
		Pct. of < 2 mm																
0-9	Ap	71.5	7.7	10.8	4.8	27.6	36.4	10.4	2.3	2.0	5.7	7.3	69.2	1.00				
9-21	B21t	77.8	7.5	14.7	5.3	25.8	34.8	9.8	2.1	1.8	5.7	6.5	75.7	1.00				
21-27	B22t	75.1	9.6	15.3	4.7	24.0	34.1	10.1	2.2	2.9	6.7	7.9	72.9	1.00				
27-37	B23t	72.9	10.0	17.1	3.9	20.4	34.6	11.1	2.9	3.5	6.5	9.8	70.0	1.00				
37-66	C1	76.9	9.1	14.0	4.4	22.3	34.9	12.5	2.8	3.2	5.9	9.8	74.1	1.00				

Depth (In.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Ext. iron as Fe Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/ Water retained at suctions of								Avail- able water in/in	Field capa- city Pct.	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			8C1c (1:1) MCl	8C1e (1:1) H ₂ O
						Pct.											
0-9	0.64	0.074	9		1.59	20.6	14.1	13.7	12.6	11.7	7.8	6.4	5.5	0.15	15.0	3.5	
9-21	0.22	0.041			1.50	23.1	15.4	15.0	14.1	13.3	9.2	8.1	7.3	0.10	14.2	3.5	
21-27	0.14				1.34	25.9	21.9	20.2	19.8	18.6	11.1	9.2	8.6	0.11	17.0	4.8	
27-37	0.11				1.37	26.4	22.2	21.0	20.8	20.3	11.5	10.2	9.1	0.10	17.1	3.8	
37-66	0.09				1.38	25.9	17.7	17.2	15.8	14.7	9.6	8.6	7.3	0.13	16.9	5.2	

Pedon Classification: Ultic Hapludalf; coarse-loamy, mixed, mesic

Soil: Series not designated

Soil No.: S59NJ-13-2

Location: Monmouth County, New Jersey; 100 feet west of gravel road 1/4 mile south of Route NJ No. 33
about 3-1/2 miles ENE of Freehold, N.J. Tunis Denise peach orchard; along second row of peach trees,
about 50 feet south of old apple orchard on opposite side of road.

Vegetation and land use: Peach orchard, vetch ground cover disked down.

Slope and land form: 2 to 3 percent.

Drainage: Well drained.

Permeability: Moderately rapid.

Parent material: Material from near the top of the Red Bank (Cretaceous) formation and beneath the Tinton formation.

Sampled by: N. A. Willits and K. P. Wilson

Horizon and
Beltsville
Lab. No.

- Ap 0 to 9 inches. Dark reddish brown (5YR 3/3) loamy sand, dark brown (7.5YR 4/4) dry; weak
60148 medium crumb structure; loose; abundant free roots; pH 5.0; abrupt smooth boundary. 9 to 10
inches thick.
- B21t 9 to 21 inches. Dark reddish brown (5YR 3/4) sandy loam, yellowish red (5YR 5/8) dry; weak
60149 coarse subangular blocky structure breaking to weak fine granular; slightly firm in place
but friable when removed, slightly brittle; many fine roots; clay bridging between grains;
one root or worm channel every 2 to 3 inches; pH 5.4; clear smooth boundary. 10 to 12 inches
thick.
- B22t 21 to 27 inches. Yellowish red (5YR 4/6) to red (2.5YR 4/6) sandy loam, yellowish red
60150 (5YR 4/8) dry; very weak medium subangular blocky structure breaking to moderate fine granules;
less firm in place than horizon above and friable when removed; a few large roots, some old
root channels filled with Al material; pH 5.4; clear smooth boundary. 5 to 6 inches thick.
- B23t 27 to 37 inches. Yellowish red (5YR 4/6) sandy loam, yellowish red (5YR 5/8) to strong brown
60151 (7.5YR 4/6) dry; very weak medium subangular blocky structure breaking to weak fine granules;
very friable; a very few roots at top; cuts greenish where glauconite grains smeared; pH 5.7;
gradual wavy boundary. 8 to 12 inches thick.
- C1 27 to 66 inches. Dark brown (7.5YR 4/4) sandy loam, strong brown (7.5YR 5/6) dry; single
60152 grain; slightly firm in place, friable when removed; very few roots; appears quite
greenish on cut faces, sand grains red coated; pH 6.2; clear smooth boundary. 30 to 36 inches
thick.
- C2 66 to 78 inches. Dark brown (7.5YR 4/4) sandy loam, yellowish brown (10YR 5/6) dry; massive;
Not sampled firm; no roots; low glauconite content; pH 5.0; clear smooth boundary. 10 to 14 inches thick.
- C3 78 to 86 inches. Dark yellowish brown (10YR 4/4) loamy sand, yellowish brown (10YR 5/8) dry;
Not sampled single grain; loose; very thinly coated sand grains; low glauconite content; pH 5.2.

Notes: Colors refer to moist soils unless indicated otherwise.

- 1/ This pedon was sampled as a representative of the Colts Neck series, but is in the Alfisols. Long term
agricultural liming and fertilization are credited with raising the base saturation from original low
levels. The control section clay content is slightly lower than in the Colts Neck series, which is in
the fine-loamy, mixed, mesic family of Typic Hapludults.

Pedon Classification: Ultic Hapludalf; fine-loamy, mixed, mesic

Soil: Series not designated^{1/}

Soil No.: S58NJ-8-4

Location: Gloucester County, New Jersey. South edge of Richwood (lat. 39°43'12", long. 75°09'48"), 400 feet north of railroad, east of cemetery and east of gravel pit about 90 feet east of edge of the pit in ~~proximity~~ ~~vicinity~~ ~~of~~ ~~Carlton~~ ~~Heritage~~.

Vegetation and land use: Peach orchard.

Slope and land form: 0 to 10 percent.

Drainage: Well drained.

Permeability: Estimated moderate in B22t, moderately slow below.

Parent material: Coastal plain medium textured sediments with brown sola.

Described by: M. Markley

Horizon and

Beltsville

Lab. No.

- Ap 59166 0 to 8 inches. Very dark grayish brown (2.5Y 3/2) gravelly sandy loam; weak medium granular structure; very friable; 15 percent rounded quartzose pebbles up to 1/2 inch diameter; pH 6.4; clear smooth boundary. 8 to 9 inches thick.
- A2 59167 8 to 14 inches. Yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; friable to firm in place; 15 percent rounded quartzose pebbles; pH 6.4; gradual wavy boundary. 6 to 10 inches thick.
- B21t Not sampled 14 to 24 inches. Dark yellowish brown (10YR 4/4) gravelly sandy clay loam; weak medium subangular blocky structure; friable; 20 percent rounded pebbles; many clay films; pH 6.2; clear broken boundary. 0 to 10 inches thick.
- IIB22t 59168 24 to 36 inches. Dark brown (7.5YR 4/4) gravelly sandy clay loam; some sandier pockets; moderate medium subangular blocky structure; firm in place but variable; 20 percent rounded pebbles, many rotted; clay films abundant, all pebbles coated by and embedded in clay; Ap material in channels; pH 5.4; gradual broken boundary. 0 to 24 inches thick.
- IIB23t 59169 36 to 96 inches. Strong brown (7.5YR 5/8) gravelly sandy clay loam; massive; firm; 20 percent rounded quartzose pebbles many rotted; pH 4.6.

Notes: Colors are for moist soil.

^{1/}This pedon was sampled as Aura, but the base saturation is in the Alfisol range. Long term agricultural liming and fertilization is credited with changing this pedon from an Ultisol. The Aura series is in the fine-loamy, mixed, mesic family of Typic Hapludults.

PEDON CLASSIFICATION: Ultic Hapludalf; fine-loamy, mixed, mesic

SOIL Series not designated

SOIL Nos. **S58NJ-8-6**

LOCATION **Gloucester County, New Jersey**

SOIL SURVEY LABORATORY **Beltsville, Maryland**

LAB. Nos. **59174 - 59178**

Depth (in.)	Horizon	181b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total			Sand				Silt					2A2 ≥ 2 < 76 Pct.	2-19 Pct.	19-76 Pct.	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02 (0.02-0.002)	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
0-6	Ap	73.0	20.8	6.2	5.9	20.2	20.5	17.5	8.9	10.0	10.8	27.9	64.1	0.95	8		
6-9	A2	64.5	26.4	9.1	5.6	18.3	18.1	15.1	7.4	10.7	15.7	25.8	57.1	0.94	9		
9-18	B21t	65.6	19.3	15.1	10.9	20.2	15.7	12.2	6.6	7.9	11.4	20.4	59.0	0.87	19		
18-28	II B22t	67.5	5.6	26.9	19.5	24.6	15.4	6.2	1.8	1.7	3.9	5.5	65.7	0.84	22		
28-60	II B23t	67.2	3.5	29.3	17.8	31.2	14.2	3.0	1.0	1.1	2.4	3.1	66.2	0.86	21		

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										pH		
					Bulk density g/cc	Water retained at suction of								Available water in/in	Field capacity Pct.	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1. bar	2 bar	6 bar	15 bar				
0-6	0.56	0.050	11	0.4	1.52	18.9	15.2	14.1	12.9	11.5	4.7	3.1	2.6	0.14	11.7		5.8
6-9	0.25	0.022	11	0.7	1.75	15.4	13.2	12.2	11.4	9.9	5.9	4.3	3.3	0.12	10.0		6.3
9-18	0.18	0.035		1.3	1.70	15.7	13.2	11.9	11.1	10.1	8.0	6.7	6.3	0.10	11.5		6.1
18-28	0.12			2.3	1.73	15.1	13.0	12.2	11.3	10.3	11.0	9.9	8.7	0.09	12.6		6.0
28-60	0.08			2.9	1.68	16.2	14.5	13.4	12.3	11.4	12.0	10.6	9.7	0.09	13.3		5.6

Depth (in.)	Extractable bases 5B1a					6H2a Ext acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3e Sum cations	CEC Sum		Ext. iron	15-bar water	5C3 Sum cations Pct.		5C1 NH ₄ OAc Pct.	
	meq/100 g														
0-6	1.8	0.6	tr.	0.3	2.7	1.5	4.2		0.68	0.06	0.42		64		
6-9	1.7	0.6	tr.	0.3	3.4	1.1	3.8		0.41	0.08	0.36		71		
9-18	2.2	0.9	tr.	0.2	3.3	1.3	4.6		0.30	0.09	0.42		72		
18-28	3.5	1.0	0.1	0.1	4.7	2.2	6.9		0.26	0.09	0.32		67		
28-60	2.5	1.3	0.1	0.1	4.0	2.8	6.8		0.23	0.10	0.33		59		

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/					a/ Methods referenced on methods code sheet.	
	Mt	Chl.	Vm	M.	Int	Qtz.	Kl.	Gibbsite	Hydraulic conductivity in/hr	Porosity					Aggregate stability Pct.
										Non-capillary Pct.	Capillary Pct.	Total Pct.	Plastic index Pct.		
0-6									0.5	14.9	23.6	38.5	59		
6-9									0.2	9.7	23.0	32.7	30		
9-18									0.4	13.6	22.4	36.0	32		
18-28									0.7	12.3	20.9	33.2	40		
28-60									0.5	11.2	24.3	35.5	42		

Pedon Classification: Ultic Hapludalf; fine-loamy, mixed, mesic

Soil: Series not designated

Soil No.: S58NJ-8-6

Location: Gloucester County, New Jersey. West of Glassboro (lat. 39°42'12"; long. 75°08'18"), field east of gravel pit, 285 feet north of abandoned railroad, 30 feet west of field border; DiEugenic farm.

Vegetation and land use: Asparagus field for at least 12 years.

Slope and land form: 10 percent.

Drainage: Well drained.

Permeability: Moderately slow.

Parent material: Coastal plain medium textured sediments with brown sola.

Described by: M. Markley

Horizon and

Beltville

Lab. No.

Ap 59174	0 to 6 inches. Dark grayish brown (2.5Y 4/2) sandy loam; weak thin platy structure; very friable, nonsticky; roots concentrated at bottom of Ap over apparent traffic pan; pH 6.2; abrupt smooth boundary. 3 to 6 inches thick.
A2 59175	6 to 9 inches. Yellowish brown (10YR 5/4) sandy loam; moderate thick to very thick platy structure; very friable, nonsticky. 5 percent chert pebbles; pH 6.4; gradual wavy boundary. 0 to 4 inches thick.
B21t 59176	9 to 18 inches. Dark yellowish brown (10YR 4/4) sandy loam; moderate medium and coarse subangular blocky structure; friable, slightly firm, sticky; discontinuous clay films on peds; 10 percent rounded quartzose pebbles; pebbles coated with clay and bedded in clay; pH 6.4; gradual broken boundary. 0 to 10 inches thick.
IIB22t 59177	18 to 28 inches. Strong brown (7.5YR 5/8) sandy clay loam with 6 to 12 inch sandy pockets; massive; very sticky; 10 percent fine pebbles; pH 6.4; gradual wavy boundary. 8 to 20 inches thick.
IIB23t 59178	28 to 60 inches. Strong brown (7.5YR 5/8) sandy clay loam with sandier strata; massive; firm, sticky; common quartzose pebbles; pH 6.4.

Notes: Colors are for moist soil.

^{1/}This pedon was sampled as Aura. Fertilization and liming are credited with raising the base saturation into the range of Alfisols. The Aura series is in the fine-loamy, mixed, mesic family of Typic Hapludults.

PEDON CLASSIFICATION: Ultic Hapludalf: fine-loamy, mixed, mesic
SOIL Series not designated

SOIL Nos. 859NJ-13-6

LOCATION Monmouth County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60170 - 60175

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1			
		1B1b Total			Sand					Silt				2A2 ≥ 2 < 76 Pct.	2-19 Pct.	19-76 Pct.	
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)					(2-0.1)
Pct. of < 2 mm																	
0-10	Ap	73.8	13.4	13.5	1.0	16.2	37.0	15.4	3.5	6.0	7.4	13.1	70.3	0.98	3		
10-15	B1	72.1	14.4	13.5	0.4	13.7	37.4	16.7	3.9	7.3	7.1	14.3	68.2	1.00			
15-24	B21t	66.4	13.3	20.3	1.0	14.6	34.5	13.0	3.3	6.8	6.5	12.7	63.1	1.00			
24-35	B22t	73.0	10.2	16.8	0.7	14.2	38.2	16.4	3.5	5.3	4.9	12.3	69.5	1.00			
35-42	B3	84.6	5.3	10.1	1.0	17.2	43.8	19.5	3.1	3.3	2.0	10.5	81.5	1.00			
42-60	C	87.2	3.8	9.0	1.4	24.4	43.9	15.2	2.3	2.5	1.3	7.5	84.9	1.00			
Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/																	
Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Water retained at suction of								Available water in/in	Field capa- city Pct.	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			8C1c (11) KCl	8C1a (1-1) H ₂ O
						Pct.											
0-10	0.57	0.068	8		1.54	21.9	17.3	15.5	14.1	12.6	7.3	6.1	5.6	0.17	16.9		
10-15	0.25	0.041	6		1.60	20.8	15.9	14.2	12.0	11.0	7.0	5.5	5.2	0.12	12.6		
15-24	0.17				1.41	25.2	19.1	16.4	13.0	11.1	11.2	9.4	8.5	0.11	16.4		
24-35	0.11				1.47	23.7	16.6	15.7	14.2	13.3	8.7	8.0	7.1	0.13	15.9		
35-42	0.05				1.47	21.5	14.0	13.2	12.0	11.1	5.8	5.0	4.9	0.13	13.9		
42-60	0.05				1.47	21.1	11.5	10.3	8.6	8.0	6.2	5.1	4.9	0.10	11.5		
Extractable bases 5B1a																	
Depth (in.)	6N2d				Sum	6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation			
	Ca	Mg	Na	K			5A3a Sum cations	CEC Sum		Ext. iron	15-bar water	5C3 Sum cations Pct.		5C1 NH ₄ OAc Pct.			
	mg/100 g																
0-10	5.9	0.7	0.1	0.1	5.6	12.4				0.92		0.41		55			
10-15	3.1	0.3	tr.	0.1	4.9	9.2				0.68		0.39		39			
15-24	4.2	0.5	0.1	0.2	5.9	10.9				0.54		0.42		46			
24-35	4.1	0.4	0.1	0.1	5.0	9.7				0.58		0.42		48			
35-42	2.9	0.2	tr.	0.1	3.5	6.8				0.67		0.49		49			
42-60	3.5	0.2	tr.	0.2	4.0	7.9				0.88		0.54		49			
Clay Fraction Analysis 7A1b-d																	
Depth (in.)	Mt	Chl	Vm.	M _i	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/				Aggregate stability Pct.				
									Porosity a/		b/			Plastic index Pct.			
									Hydraulic conductivity in/hr	Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.					
0-10									4.3	11.1	26.6	37.7	74				
10-15									1.6	10.1	26.4	36.5	27				
15-24									6.3	16.2	27.4	43.6	18				
24-35									3.2	16.9	24.4	41.3	19				
35-42									7.7	20.4	20.3	40.7	25				
42-60									14.2	24.9	14.7	39.6	64				

a/ Methods refer-
enced on
methods code
sheet.

Pedon Classification: Ultic Hapludalf; fine-loamy, mixed, mesic
 Soil: Series not designated
 Soil No.: S59NJ-13-6
 Location: Monmouth County, New Jersey. 25 feet into hay field on south side of Prothero Road, 100 feet from intersection with Hyers Mill Road. Gemmel farm.
 Vegetation and land use: Alfalfa-grass hay mixture.
 Slope and land form: 2 to 3 percent.
 Drainage: Well drained.
 Permeability: Moderately rapid.
 Parent material: Red sand from Red Bank Formation (Cretaceous).
 Sampled by: N. A. Willits and K. P. Wilson

Horizon and
 Beltsville
 Lab. No.

Ap 0 to 10 inches. Dark reddish brown (5YR 3/2) sandy loam, dark brown (7.5YR 4/2) dry; weak fine granular structure; firm when dry; abundant fine roots; pH 5.6; abrupt smooth boundary. 9 to 10 inches thick.

B1 10 to 15 inches. Dark reddish brown (5YR 3/4) sandy loam, yellowish red (5YR 4/6) dry; very weak coarse platy structure breaking to weak fine granular structure: firm and slightly

B21t 15 to 24 inches. Reddish brown (5YR 4/4) sandy clay loam, cuts yellowish, yellowish red (5YR 4/6) dry; weak fine granular structure; slightly firm in place, friable when removed; few coarse and fine roots; many root and worm channels filled with Ap material; pH 5.4; gradual smooth boundary. 9 to 10 inches thick.

B22t 24 to 35 inches. Reddish brown (5YR 4/4) sandy loam, cuts yellowish, yellowish red (5YR 4/8) dry; very weak subangular blocky structure; slightly firm in place, friable when removed; few coarse and fine roots; discontinuous clay films on peds; many root and worm channels filled with organic matter; pH 5.6; gradual wavy boundary. 9 to 15 inches thick.

B3 35 to 42 inches. Reddish brown (5YR 4/4) loamy sand, yellowish red (5YR 4/6) dry; massive or single grain; slightly firm in place, friable when removed; few roots; grains slightly aggregated; pH 6.2; gradual smooth boundary. 7 inches thick.

C 42 to 60 inches. Reddish brown (5YR 4/4) loamy sand, yellowish red (5YR 4/6) or yellow, dry; single grain; loose; many scattered 1/8 to 1/2 inch fragments of iron concretions; pH 6.2. Becomes somewhat looser and yellowish with depth; pH 5.0 at 60 inches.

Notes: Colors refer to moist soil unless indicated otherwise.

¹/This pedon was sampled as a representative of the Colts Neck series but is an Alfisol. Long-term agricultural liming and fertilization are credited with raising the base saturation from original low levels. Colts Neck series is in the fine-loamy mixed, mesic family of Typic Hapludults.

PEDON CLASSIFICATION: Ultic Hapludalf; fine-loamy, siliceous, mesic

SOIL Series not designated

SOIL Nos. S60NT-11-1

LOCATION Mercer County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60408 - 60413

Depth (In.)	Horizon	181b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total												2A2 ≥ 2 < 76	2-19	19-76	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
0-11	Ap	48.6	41.5	9.9	2.6	14.7	13.0	11.5	6.8	22.8	18.7	34.3	41.8	0.98	3		
11-14	AB	47.0	37.9	15.1	2.8	16.2	13.3	9.4	5.3	16.0	21.9	25.3	41.7	0.99	2		
14-21	B2t	51.6	29.9	18.5	2.8	17.7	15.2	10.6	5.3	13.7	16.2	23.3	46.3	0.98	4		
21-28	B31	65.5	18.8	15.7	3.8	27.2	19.0	11.0	4.5	8.6	10.2	17.4	61.0	0.96	6		
28-34	B32, B33	61.8	22.5	15.7	3.5	22.5	17.3	12.9	5.6	11.8	10.7	22.8	56.2	0.97	5		
34-42	IIC	85.8	6.3	7.9	1.4	30.3	36.3	14.3	3.5	2.6	3.7	10.6	82.3	0.96	6		

Depth (In.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/										pH				
						Water retained at suctions of											Available water in/in	Field capacity Pct.	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar	8C1b Pct.						
0-11	0.69	0.093	7		1.58	20.5	18.4	17.7	16.6	15.3	9.6	6.0	4.3	0.19	16.3		5.0			
11-14	0.18	0.064			1.69	18.3	17.4	16.7	15.7	15.2	11.2	8.2	6.8	0.17	16.6		5.0			
14-21	0.12				1.62	19.0	17.6	16.6	15.0	13.2	11.6	9.4	7.9	0.05	17.3		5.5			
21-28	0.06				1.72	16.7	15.2	14.2	13.1	11.4	9.7	8.2	6.7	0.18	16.8		6.0			
28-34	0.04				1.75	15.3	14.2	13.7	12.4	11.1	10.0	8.0	6.9	0.14	14.5		6.0			
34-42	-				1.58	13.4	10.3	9.7	8.7	7.4	7.1	5.9	5.2	0.13	13.5		5.8			

Depth (In.)	Extractable bases 5B1a					6H2a Ext. acidity	6H2e CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2e K	Sum		5A3e Sum cations	Ext. Al		CEC Sum	Ext. iron	15-bar water		SC3 Sum cations Pct.	SC1 NH ₄ OAc Pct.
	meq/100 g														
0-11	2.1	0.4	tr.	0.4	2.9	6.0	8.9				0.90		0.43		32
11-14	2.7	0.7	tr.	0.2	3.6	3.9	7.5				0.50		0.45		48
14-21	3.6	0.8	tr.	0.2	4.6	3.5	8.2				0.44		0.43		57
21-28	3.3	0.5	tr.	0.1	3.9	2.7	6.7				0.43		0.43		58
28-34	3.3	0.5	tr.	0.1	3.9	2.3	6.2				0.39		0.44		63
34-42	1.5	0.2	tr.	0.1	1.8	1.8	3.6				0.45		0.66		50

Depth (In.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/					8/Methods refer- enced on methods code sheet.
	Mt.	Chl.	Vm.	Mi	Int.	Qtz.	Kl.	Gibbsite	Porosity 8/					
									Hydrau- lic conduct- ivity in/hr	Non- capil- lary Pot.	Capil- lary Pot.	Total Pot.	Plastic Index Pot.	
0-11									0.3	9.1	28.7	37.8		
11-14									0.5	5.7	29.3	35.0		25
14-21									0.4	9.0	28.4	37.4		
21-28									0.3	7.8	26.1	33.9		
28-34									0.1	8.1	24.7	32.8		25
34-42									2.7	19.7	16.2	35.9		

Pedon Classification: Ultic Hapludalf; fine-loamy, siliceous, mesic

Soil: Series not designated^{1/}

Soil No.: S60NJ-11-1

Location: Mercer County, New Jersey. Approximately 1 mile southeast of Dutch Neck, on LeRoy Grover farm, east of farm barns approximately 300 feet and south of farm lane about 125 feet.

Vegetation and land use: Cultivated annual crops, potatoes, with winter cover crop of wheat at the time of sampling.

Slope and land form: 2 percent.

Drainage: Moderately well drained.

Permeability: Moderate.

Parent material: Developed in silt to very fine sand deposits ranging from about 18 inches to more than 5 feet in thickness.

Described by: G. A. Quakenbush

Horizon and
Beltsville
Lab. No.

Ap 0 to 11 inches. Dark grayish brown (10YR 4/2) loam; massive; very weak coarse platiness in the lower 4 inches; friable in upper part, firm in lower 4 inches; abrupt smooth boundary. 10 to 11 inches thick.

60408

AB 11 to 14 inches. Brown (10YR 5/3) loam, splotted 40 percent with brown (7.5YR 5/4); massive; under careful pressure yielding very weak, coarse platiness; very firm; heavily splotted with material in burrows from overlying horizons; clear, slightly wavy boundary. 2 to 4 inches thick.

60409

B2t 14 to 21 inches. Dark brown (7.5YR 4/4) loam; very weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; clear slightly wavy boundary. 7 to 10 inches thick.

60410

B31 21 to 28 inches. Dark brown (7.5YR 4/4) fine sandy loam; massive; friable, slightly sticky; some pale colored sand grains resembling those in the C horizon; gradual boundary. 3 to 8 inches thick.

60411

B32 28 to 31 inches. Strong brown (7.5YR 5/6) fine sandy loam; very few, fine distinct light brownish gray (2.5YR 6/2) mottles and faint to distinct bands of reddish brown (5YR 4/4); massive; friable, slightly sticky, some parts slightly firm and very slightly brittle; clear slightly wavy boundary. 2 to 3 inches thick.

B33 31 to 34 inches. Strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) fine sandy loam; common, medium, distinct mottles toward 2.5Y; massive; friable, slightly sticky; pebbles distinctly clay coated. 0 to 4 inches thick.

60412

IIC 34 to 42 inches. Strong brown (7.5YR 5/6) sand; single grained; loose except for upper 2 to

Notes: B32t and B33t combined into sample no. 60412.
Colors refer to moist soil.

^{1/}Similar to Woodstown series except in base saturation. Long term agricultural liming and fertilization has raised the base saturation to the Alfisol range. The Woodstown series is in the fine-loamy, siliceous, mesic family of Aquic Hapludults.

PEDON CLASSIFICATION: Typic Quartzipsamment; mesic, coated

SOIL Evesboro sand SOIL Nos. 59231-5-3 LOCATION Cape May County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 59231 - 59235

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1			
		1B1b Total		Sand					Silt		Int. II (0.2-0.02)	(2-0.1)		2A2 ≥ 2	2-19	19-76	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (≤ 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02							Int. III (0.02-0.002)
0-3	A1, A2, B2	95.2	3.6	1.2	1.2	36.3	37.7	19.3	0.7	1.6	2.0	7.5	94.5	1.00	-	-	-
3-14	A ²	94.1	3.9	2.0	0.8	32.4	36.0	23.8	1.1	1.3	2.6	11.5	93.0	1.00	-	-	-
14-25	B ¹	92.7	4.5	2.8	1.0	26.9	34.7	28.4	1.7	1.4	3.1	14.5	91.0	1.00	-	-	-
25-36	B ¹ 2	90.9	4.7	4.4	1.3	29.5	34.4	24.6	1.1	1.2	3.5	11.6	89.8	1.00	tr.	-	-
36-48	C	97.1	1.4	1.5	1.7	31.8	36.0	26.1	1.5	0.7	0.7	12.3	95.6	1.00	tr.	-	-

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University B/								Available water in/in	Field capacity Pct.	pH			
					Bulk density g/cc	Water retained at suctions of									8D3 Ca/Mg	8C3 Sum cations Pct.	8C1a (1:1) NCl	8C1b (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar						
0-3	0.81	0.023	35	0.1	1.40	26.4	12.2	9.2	7.2	6.2	2.1	1.6	1.5	0.106	9.1	7.8	4.1	
3-14	0.34	0.029	12	0.2	1.38	27.8	11.5	9.0	7.5	6.3	2.4	1.9	1.3	0.090	7.8	7.8	4.7	
14-25	0.08	0.027		0.2	1.52	20.6	7.4	5.2	3.8	3.0	2.2	1.9	1.5	0.073	6.3	7.8	4.6	
25-36	0.08			0.3	1.57	18.9	7.0	4.8	4.1	3.4	2.5	2.1	1.8	0.064	5.9	7.8	4.6	
36-48	0.02			0.1	1.61	19.0	6.2	3.0	2.4	1.8	1.0	1.0	0.7	0.066	4.8	7.8	4.7	

Depth (in.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	CEC Sum		Ext. iron	15-bar water	8C3 Sum cations Pct.		8C1 NH ₄ OAc Pct.	
	mg/100 g														
0-3	0.6	0.2	0.1	tr.	0.9	2.4	3.3						27		
3-14	0.3	0.1	tr.	tr.	0.4	3.7	4.1						10		
14-25	0.3	0.2	tr.	tr.	0.5	2.7	3.2						16		
25-36	0.2	0.2	0.1	0.1	0.6	3.5	4.1		0.93	0.07	0.41		15		
36-48	0.4	0.1	tr.	tr.	0.5	1.6	2.1						24		

Pedon Classification: ¹Typic Quartzipsamment; mesic, coated
 Soil: Evesboro sand
 Soil No.: S58NJ-5-3

Location: Cape May County, New Jersey. About 3 miles southeast of South Dennis along route 38 west of railroad overpass slightly around a curve, south side of road, about 50 feet west of cut through a sand ridge.

Vegetation and land use: Forest, mainly oak with some holly and sassafras.

Slope and land form: 2 percent.

Drainage: Excessively drained.

Permeability: Rapid.

Parent material: Deep sands of the coastal plain.

Described by: G. A. Quakenbush

Horizon and
 Beltsville
 Lab. No.

O1 3 inches to 1/2. Last years leaves, mainly oak.
 Not sampled

O2 1/2 inch to 0. Dark reddish brown (5YR 2/2) disintegrated organic residue in a weak mat
 Not sampled with some colorless sand grains.

A1, A2, B2 0 to 3 inches. Very dark brown (10YR 2/2) sand, (10YR 3/1) dry; dark gray (10YR 4/1) sand,
 59231 (10YR 6/1) dry; dark brown (7.5YR 3/2) sand, (10YR 5/3) dry; single grain; loose; clear broken boundary. 0 to 4 inches thick.

A'2 3 to 14 inches. Yellowish brown (10YR 5/4) sand, light yellowish brown (10YR 6/4) dry; single
 59232 grain; loose; diffuse wavy boundary. 10 to 15 inches thick.

B'1 14 to 25 inches. Yellowish brown (10YR 5/6) sand, light yellowish brown (10YR 6/4) dry;
 59233 single grain; loose; gradual smooth boundary. 10 to 12 inches thick.

B'2 25 to 36 inches. Strong brown (7.5YR 5/6) sand, light yellowish brown (10YR 6/4) dry; single
 59234 grain; loose; gradual wavy boundary. 8 to 11 inches thick.

C 36 to 48 inches. Brownish yellow (10YR 6/6) sand, yellow (10YR 7/5) dry; single grain;
 59235 loose.

Notes: Colors are for moist soil unless indicated otherwise.

¹The lower B horizon colors are redder than described for the Evesboro series, but not suitably divergent for a taxadjunct.

PEDON CLASSIFICATION: Typic Quartzipsamment; mesic, coated

SOIL Evesboro sand SOIL Nos. 59827-3-4 LOCATION Burlington County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 59218 - 59223

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1													3B2 Cm	3B1 Coarse fragments		
		Total				Sand				Silt						2A2 ≥ 2	2-19	19-76
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)	(2-0.1)	Pct.				
0-11 11-15	Ap A21	93.9 82.2	2.9 2.5	3.2 3.6	3.3 2.0	30.8 22.2	29.8 25.0	25.4 20.0	4.6 6.0	0.8 0.0	2.1 2.5	16.9 23.5	89.3 86.0	1.00 1.00	tr.			

Pedon Classification: Typic Quartzipsamment; mesic, coated

Soil: Evesboro sand^{1/}

Soil No.: 556NJ-3-4

Location: Burlington County, New Jersey. 2 1/4 miles, by road, east of Riverton, north side of Millside farm, east of entrance from side road, west from Route 130, north of farm lane leading from that entrance after a 90° curve, midway up slope and about 70 feet into the field.

Vegetation and land use: Cultivated, in alfalfa, part of dairy farm.

Slope and land form: 4 percent.

Drainage: Excessively drained.

Permeability: Rapid.

Parent material: Deep sands of the coastal plain.

Described by: G. A. Quakenbush

Horizon and

Beltsville

Lab. No.

Ap 59218	0 to 11 inches. Dark grayish brown (10YR 4/2) sand, brown (10YR 5/3) dry; single grain; very friable; abrupt wavy boundary.
A21 59219	11 to 15 inches. Dark brown (7.5YR 4/4) sand with 30 to 40 percent of the grains strong brown (7.5YR 5/6) light yellowish brown (10YR 6/4) dry; single grain; very friable; very few scattered firm, concretionary nodules; clear smooth boundary. 4 inches thick.
A22 59220	15 to 18 inches. Strong brown (7.5YR 5/6) sand with 20 to 30 percent of the grains brown (7.5YR 4/4), light yellowish brown (10YR 6/4) dry; single grain; very friable; clear smooth boundary. 3 to 7 inches thick.
B2 59221	18 to 29 inches. Strong brown (7.5YR 5/6) sand, reddish yellow (7.5YR 7/6) dry; friable; clear smooth boundary. 5 to 11 inches thick.
B3 59222	29 to 33 inches. Yellowish brown (10YR 5/6) sand, reddish yellow (7.5YR 7/6) dry; single grain; loose; gradual wavy boundary. 4 to 9 inches thick.
C 59223	33 to 50 inches. Yellowish brown (10YR 5/6) sand, light yellowish brown (10YR 6/4) single grain; loose.

Notes: Colors refer to moist soil unless indicated otherwise.

^{1/}The B horizon colors are redder than described for the Evesboro series but not suitably divergent for a taxadjunct. Base saturation has been elevated by heavy agricultural liming and fertilization.

PEDON CLASSIFICATION: Typic Quartzipsamment; mesic, coated

Burlington County New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59224 - 59230

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) SAI											3B2 Cm	3B1 Coarse fragments			
		Total			Sand					Silt				2A2 > 2	2-19	19-76	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
Pct. of < 2 mm																	
0-7	Ap	92.9	4.3	2.8	0.4	12.2	33.0	40.1	7.2	1.8	2.5	26.5	85.7	1.00	tr.		
7-12	A21	91.2	5.4	3.4	0.4	8.0	28.2	46.0	8.6	2.1	3.3	32.3	82.6	1.00	-		
12-24	A22	94.2	2.8	3.0	0.4	7.8	30.1	48.5	7.4	0.9	1.9	30.6	86.8	1.00	tr.		
24-37	B2	94.2	2.2	3.6	0.1	5.9	27.5	52.8	7.9	0.8	1.4	32.6	86.3	1.00	-		
37-44	B & C1	94.0	3.2	2.8	0.4	12.7	28.5	40.8	11.6	2.1	1.1	33.8	82.4	1.00	-		
44-53	IIC2	88.4	5.9	5.7	0.8	11.7	27.4	37.2	11.3	3.2	2.7	31.9	77.1	1.00	-		
53-70	IIC3	95.5	2.2	2.3	1.6	12.9	33.1	38.6	9.3	1.5	0.7	28.6	86.2	1.00	-		
Analyses by New Jersey Agr. Exp. Sta., Rutgers University B/																	
Depth (in.)	6A1a Organic carbon	6B2a Nitrogen	C/N	6C1a Ext. iron as Fe	Bulk density	Water retained at suction of								Available water	Field capacity	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			8C1c (1:1) KCl	8C1a (1:1) H ₂ O
Pct. g/cc Pct. in/in Pct.																	
0-7	0.31	0.028	11	0.6	1.54	23.3	15.2	9.5	7.7	6.1	3.0	2.3	1.6	0.089	7.4		6.4
7-22	0.13	0.016		0.6	1.61	22.7	15.4	8.1	6.0	4.7	3.0	2.3	1.8	0.103	8.2		5.7
12-24	0.08	0.034		0.7	1.48	25.1	13.2	6.9	5.4	4.3	2.6	2.3	1.7	0.096	8.2		4.7
24-37	0.06	0.032		0.7	1.48	26.3	12.2	7.2	5.9	5.1	2.4	2.3	1.9	0.084	7.6		4.6

Pedon Classification: Typic Quartzipsamment; mesic, coated

Soil: Evesboro sand

Soil No.: S58NJ-3-5

Location: Burlington County, New Jersey. South of the town of Burlington, along road going east from Cooperstown, few hundred feet east of intersection of Burlington Charleston Road, north of Cooperstown Road about 60 feet; in peach orchard of Hugh Farmer and Sons.

Vegetation and land use: Cultivated, in peaches.

Slope and land form: 3 percent.

Drainage: Excessively drained.

Permeability: Rapid.

Parent material: Deep sands of the coastal plain.

Described by: G. A. Quakenbush

Horizon and

Beltsville

Lab. No.

Ap 59224	0 to 7 inches. Dark brown (10YR 4/3) sand; weak fine granular structure; very friable; abrupt smooth boundary. 6 to 7 inches thick.
A21 59225	7 to 12 inches. Yellowish brown (10YR 5/4) sand, light yellowish brown (10YR 6/4) dry; single grain; loose; gradual smooth boundary. 5 to 6 inches thick.
A22 59226	12 to 24 inches. Dark yellowish brown (10YR 4/4) sand, light yellowish brown (10YR 6/4) dry; single grain; loose; clear wavy boundary. 10 to 15 inches thick.
B2 59227	24 to 37 inches. Strong brown (7.5YR 5/6) sand, light yellowish brown (10YR 6/5) dry; single grain; loose; clear wavy boundary. 10 to 15 inches thick.
B and C1 59228	37 to 44 inches. Varicolored, 40 percent dark yellowish brown (10YR 4/4), 45 percent strong brown (7.5YR 5/6), 10 percent yellowish red (5YR 5/6), with wavy bands 1/4 inch to 1/2 inch thick yellowish red (5YR 3/6) sand with bands of loamy sand; mostly single grain; loose to very friable, bands firm; some bands are elongated nodules. 5 to 8 inches thick.
IIC2 59229	44 to 53 inches. Varicolored, dominant colors: 60 percent yellowish brown (10YR 5/4) and 40 percent reddish brown (5YR 4/4) sand with sandy loam in some redder masses; single grain with massive bands and nodules; 50 percent friable, 10 percent firm, 30 percent loose; firmness goes with redness and finer textures. 8 to 12 inches thick.
IIC3 59230	53 to 70 inches. Generally yellowish brown (10YR 5/6) sand sprinkled with 15 percent darker values and 25 percent toward 7.5YR; single grain; loose; some very minor bands and nodules.

Notes: Colors are for moist soil unless indicated otherwise.

¹/The B horizon colors are redder than described for the Evesboro series but not suitably divergent for a taxadjunct. Base saturation has been elevated by heavy agricultural liming and fertilization.

PEDON CLASSIFICATION: Aquic Dystrachrept; coarse-loamy, siliceous, mesic
SOIL Series not designated SOIL Nos. 86187-4-3 LOCATION Camden County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 62209-62213

Depth (in.)	Horizon	191b Size class and particle diameter (mm) 3A1												3B2 Cm	3B1 Coarse fragments		
		Total				Sand				Silt					2A2 > 2 < 76 Pct.	2-19 Pct.	19-76 Pct.
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02 (0.02-0.002)	Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)				
Pct. of < 2 mm																	
0-5	Apl	61.2	28.3	10.5	1.3	9.2	10.6	24.3	15.8	13.1	15.2	42.8	45.4	2			
5-10	Ap2	66.8	23.6	9.6	1.5	8.9	11.1	27.6	17.7	10.3	13.3	44.0	49.1	2			
10-14	A2	73.3	19.4	7.3	2.1	9.3	12.3	33.5	16.1	9.1	10.3	45.0	57.2	10			
14-19	B1t	73.8	17.3	8.9	2.8	8.4	11.6	35.2	15.8	8.7	8.6	45.1	58.0	17			
19-26	B2g	61.6	30.0	8.4	1.3	7.5	9.0	22.5	21.3	14.9	15.1	49.8	40.3	2			
26-60	ICg	92.1	4.8	3.1	10.0	23.9	23.4	30.2	4.6	2.0	2.8	19.9	87.5	47			
Depth (in.)	6A1a Organic carbon	6B2a Nitrogen	C/N	Carbonate as CaCO ₃	Ext. iron as Fe	Bulk density			4D1 COLE	Water content			4C1 WRD in/in	pH			
						4A1e ½ bar g/cc	4A1h Oven dry g/cc			4B1c ½ bar Pct.	4B2 15 bar Pct.			8C1c (1:1) KCl	8C1e (1:1) H ₂ O		
0-5	1.88	0.114	16														
5-10	1.14	0.077	15														
10-14	0.25																
14-19	0.13																
19-26	0.06																
26-60	0.04																
Depth (in.)	Extractable bases 5B1a					5H2a Ext. acidity	CEC		5G1d Ext. Al	Ratios to clay 5D1			5D3 Ca/Mg	Base saturation			
	5W2d Ca	5O2b Mg	5P2a Na	5Q2a K	Sum		5A5a Sum cations			CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.		
0-5	4.0	0.7	0.1	0.6	5.4	7.7	13.1				1.25			41			
5-10	3.2	0.6	0.1	0.2	4.1	5.1	9.2				0.96			44			
10-14	1.1	0.3	0.1	0.1	1.6	2.3	3.9				0.53			41			
14-19	1.3	0.4	0.1	0.1	1.9	2.3	4.2				0.47			45			
19-26	0.8	0.4	tr.	tr.	1.2	1.9	3.1				0.37			39			
26-60	0.4	0.2	tr.	tr.	0.6	0.8	1.4				0.45			43			
Depth (in.)	Clay Fraction Analysis 7A1b-d																
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite									
7A2 ←-----→ 7A3																	

Mt. = Montmorillonite, Chl. = chlorite, Vm. = Vermiculite, mi = mica, Int. = interstratified layer, Qtz. = quartz, Kl. = Kaolinite
Relative amounts: blank = not determined, dash = not detected, tr. = trace, x = small, xx = moderate, xxx = abundant, xxxx = dominant.

Pedon Classification: Aquic Dystrachrept; coarse-loamy, siliceous, mesic

Soil: Series not designated^{1/}

Soil No.: S61NJ-4-3

Location: Camden County, New Jersey. Southwest of Berlin 1-1/4 mile, northeast of road intersection, north of Watsonstown—New Freedom Road.

Vegetation and land use: Asparagus; cultivated crops.

Slope and land form: Lower section of gentle slope, grade about 1 percent.

Drainage: Somewhat poorly drained.

Permeability: Moderately rapid.

Ground water: Free water encountered at 40 inches (July 26, 1961).

Described by: Marco Markley

Horizon and

Beltsville

Lab. No.

Ap1 62209	0 to 5 inches. Very dark grayish brown (2.5Y 3/2) sandy loam, grayish brown (2.5Y 5/2) dry; weak to moderate medium granular structure; very friable; less than 2 percent rounded quartz pebbles; most asparagus roots dead in sample area; abrupt smooth boundary.
Ap2 62210	5 to 10 inches. Very dark grayish brown (2.5Y 3/2) sandy loam; common fine distinct dark brown to brown (7.5YR 4/4) mottles; massive with platy tendency; firm in place, friable when removed; less than 2 percent rounded quartz pebbles; abrupt smooth boundary.
A2 62211	10 to 14 inches. Light olive brown (2.5Y 5/4) sandy loam; few fine faint mottles; weak fine granular structure; very friable; 10 percent rounded quartz pebbles; abrupt smooth boundary. 0 to 4 inches thick.
B1t 62212	14 to 19 inches. Light olive brown (2.5Y 5/4) sandy loam; common fine and medium prominent brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable; 10 percent rounded quartz pebbles; gradual smooth boundary. 3 to 5 inches thick.
B2g 62213	19 to 26 inches. Light brownish gray (2.5Y 6/2) sandy loam; common medium prominent mottles; moderate medium subangular blocky structure; friable or slightly firm; 2 percent rounded quartz pebbles; clay films darker gray, in pores; abrupt smooth boundary. 6 to 10 inches thick.
IICg 62214	26 to 60 inches. Grayish brown (2.5Y 5/2) gravelly sand; single grained; loose; 10 to 35 percent rounded quartz pebbles stratified.

Notes: Color readings are for moist soil except where exception is specified. Soil moist at time of sampling. Sampling pit revealed considerable variation in depth of soil, color, and gravel in other places prominent mottling occupied up to 40 percent. In parts of the Cg horizon there was no gravel, but in most parts it was abundant enough to give a gravelly sand texture. Colors are for moist soil.

^{1/}This pedon is similar in most respects to the Hammonton series but lacks an argillic horizon. Hammonton is in the coarse-loamy, siliceous, mesic family of Aquic Hapludults.

PEDON CLASSIFICATION: Dystric Eutrochrept; sandy, siliceous, mesic
SOIL Series not designated SOIL Nos. 860NJ-4-3 LOCATION Camden County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 61124 - 61127

Depth (In)	Horizon	1B1b Size class and particle diameter (mm) 3A1												3B2 Cm	Coarse fragments 3B1		
		Total				Sand				Silt					2A2 > 2 < 76 Pct	2-19	19-76
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)				
Pct of < 2 mm																	
0-10	Ap	69.9	19.5	10.6	3.5	19.7	17.7	20.1	8.9	6.5	13.0	25.7	61.0	0.98	3		
10-16	B2	73.7	16.4	9.9	5.1	19.2	18.2	21.1	10.1	6.7	9.7	27.9	63.6	0.94	8		
16-22	B3	80.5	10.0	9.5	9.6	27.0	20.2	16.3	7.4	3.8	6.2	19.2	73.1	0.84	23		
22-60	C	91.2	3.0	5.8	8.3	35.2	31.9	11.9	3.9	1.7	1.3	9.5	87.3	0.87	19		

Depth (In.)	6A1a Organic carbon Pct.	Nitrogen Pct.	C/N	Ext. iron as Fe Pct	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										pH				
					Bulk density g/cc	Water retained at suction of										Avail- able water in/in	Field capa- city Pct.	8C1c (1.1) KCl	8C1a (1.1) H2O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar						
0-10	0.95				1.62	17.6	14.2	12.4	10.6	9.4	8.3	5.5	4.6				5.8		
10-16	0.22				1.81	13.8	10.6	9.8	8.8	8.0	6.2	4.3	3.9				6.2		
16-22	0.14				1.75	15.3	9.8	8.9	8.4	7.8	5.1	4.0	3.4				6.2		
22-60	0.04				1.69	13.2	4.9	4.6	4.2	3.9	2.6	2.1	1.8				6.9		

Depth (In)	Extractable bases 5B1a					6H2a Ext acidity meq/100 g	CEC		6G1d Ext Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	Ext Al		CEC Sum	Ext. iron	15 bar water		5C3 Sum cations Pct	5C1 NH4OAc Pct.
0-10	4.0	0.4	0.1	0.2	4.7	3.9	8.6				0.81	0.43		55	
10-16	2.2	0.2	tr.	0.1	2.5	1.8	4.4				0.44	0.39		59	
16-22	1.8	0.2	tr.	0.1	2.1	1.8	4.0				0.42	0.36		55	
22-60	2.1	0.1	tr.	0.1	2.3	0.5	2.8				0.48	0.31		82	

Pedon Classification: Dystric Eutrochrept; sandy, siliceous, mesic

Soil: Series not designated^{1/}

Soil No.: S60NJ-4-3

Location: Camden County, New Jersey. 160 feet south of Erial-New Brooklyn Road and 100 feet west of road from Erial-New Brooklyn Road to Sicklerville, George Young farm.

Vegetation and land use: Improved pasture, of orchard grass and ladino clover.

Slope and land form: Nearly level, 0 to 1 percent.

Drainage: Well drained.

Permeability: Moderate.

Described by: Marco L. Markley

Horizon and
Beltsville
Lab. No.

Ap 61124	0 to 10 inches. Dark grayish brown (2.5Y 4/2) sandy loam; weak fine granular structure tending toward weak platy; friable; common roots; 0 to 2 percent rounded quartzose pebbles. 9 to 11 inches thick.
B2 61125	10 to 16 inches. Dark yellowish brown (10YR 4/4) sandy loam; massive; friable, slightly firm in the upper three inches; common roots; 3 to 5 percent rounded quartzose pebbles; gradual, wavy boundary. 5 to 8 inches thick.
B3 61126	16 to 22 inches. Dark yellowish brown (10YR 4/4) sandy loam; massive; very friable; common roots; 3 to 15 percent quartzose pebbles; gradual, wavy boundary. 5 to 8 inches thick.
C 61127	22 to 60 inches. Yellowish brown (10YR 5/6) loamy coarse sand; single grain and stratified; loose; 5 to 15 percent rounded quartz pebbles averaging 1/2 inch diameter but ranging to 3 inches; with bands of (10YR 4/4) color and sandy loam, 1 to 3 inches thick.

^{1/}This pedon was sampled as a representative of the Downer series but lacks an argillic horizon, has base saturation elevated by agricultural liming and fertilization, and has weighted average control texture finer than this pedon. Downer is in the coarse-loamy, siliceous, mesic family of Typic Hapludults.

FEDON CLASSIFICATION: Typic Rhodudult; coarse-loamy, mixed, mesic
SOIL Colts Neck taxadjunct SOIL Nos. 859NJ-13-4

LOCATION Monmouth County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60158 - 60162

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total		Sand					Silt					2A2 ≥ 2 < 76 Pct.	2-19 Pct.	19-76 Pct. of < 76mm	
		Sand (2-0.05) (0.05-0.002)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02 (0.02-0.002)	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
0-7	A1, A2	68.2	17.9	13.9	1.5	23.5	32.9	8.1	2.2	6.6	11.3	10.4	66.0	0.99	2		
7-18	B1	71.2	16.2	12.6	1.7	25.0	34.4	7.9	2.2	5.7	10.5	9.6	69.0	0.99	2		
18-27	B2t	71.1	10.3	18.6	2.4	26.6	32.9	7.3	1.9	3.6	6.7	7.1	69.2	0.98	3		
27-33	B3t	76.9	8.5	14.6	1.5	23.8	39.9	9.6	2.1	2.5	6.0	6.8	74.8	0.98	3		
33-48	C	82.7	5.9	11.4	2.1	29.4	41.2	8.6	1.4	2.2	3.7	5.2	81.3	0.98	3		

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/								pH				
						Water retained at suction of									Avail-able water in/in	Field capacity Pct.	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar					
0-7	1.53	0.109	14		1.08	41.3	28.8	26.6	24.4	22.2	0.8	9.2	7.4	0.14	20.3			
7-18	0.55	0.046	12		1.27	28.7	18.0	17.5	16.2	14.5	10.3	7.9	6.8	0.14	18.1			
18-27	0.14	0.035			1.36	27.1	20.4	20.2	18.7	17.4	12.6	11.9	10.6	0.14	20.7			
27-33	0.10				1.38	26.7	19.0	18.5	15.8	13.9	12.0	10.8	10.0	0.12	18.8			
33-48	0.07				1.37	26.4	18.4	17.5	15.5	13.8	10.6	10.0	9.0	0.12	17.5			

Depth (in.)	Extractable bases 5B1a					6N2a Ext. acidity	6N2a Ext. acidity	6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation		
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum				5A3a Sum cations	CEC Sum	Ext. iron		15-bar water	5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	mg/100 g														
0-7	0.3	0.2	0.1	0.3	0.9	18.6	19.5				1.40	0.53		5	
7-18	tr.	0.1	tr.	0.2	0.3	10.3	10.7				0.85	0.54		4	
18-27	0.1	0.4	tr.	0.1	0.6	13.6	14.3				0.77	0.57		5	
27-33	0.2	1.1	tr.	0.2	1.5	13.0	14.6				1.00	0.68		11	
33-48	tr.	1.2	tr.	0.1	1.3	13.3	14.7				1.29	0.79		10	

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers a/					Methods refer-enced on methods code sheet.
	Mt.	Chl.	Vm.	Ml.	Int.	Qtz.	Kl.	Gibbsite	Porosity a/		Plastic index	Aggregate stability		
									Hydrau-lic conduc-tivity in/hr	Non-capil-lary			Capil-lary	
0-7									18.3	23.2	31.9	55.1	77	
7-18									14.2	27.4	22.9	50.3	77	
18-27									7.3	18.3	27.9	46.2	43	
27-33									7.6	18.7	26.8	45.5	81	
33-48									8.7	19.0	25.6	44.6	N.P.	

Pedon Classification: Typic Rhodudult; coarse-loamy, mixed, mesic
 Soil: Colts Neck taxadjunct $\frac{1}{2}$ /
 Soil No.: S59NJ-13-4
 Location: Monmouth County, New Jersey. One mile north of Colts Neck, 500 feet north of Flock Road, 100 feet into woodlot on east side of road.
 Vegetation and land use: White oak, beech, maple, viburnum.
 Slope and land form: 6 percent.
 Drainage: Rapid.
 Permeability: Rapid.
 Parent material: Developed from the coarse glauconitic sands of the upper part of the Red Band formation (Cretaceous).
 Sampled by: N. A. Willits and K. P. Wilson

Horizon and
 Beltsville
 Lab. No.

- O1 2 inches to 1/2. Loose leaves, oak, beech, maple, white oak. Not noticeably tied together.
 Not sampled
- O2 1/2 inch to 0. Dark reddish brown (2.5YR 2/4) matted leaves, granular to fibrous with fine roots and mycelia; 20 percent mineral matter; abrupt smooth boundary.
 Not sampled
- A1 0 to 2 inches. Dusky red (2.5YR 3/2) to dark reddish brown (2.5YR 2/4) sandy loam; weak fine granular structure; loose; abundant roots; silt dust cemented to sand grains; pH 5.1; clear smooth boundary. 1/2 to 2 inches thick.
 60158
- A2 2 to 7 inches. Dark reddish brown (2.5YR 3/4) sandy loam, yellowish red (5YR 4/6) dry; weak fine granular structure; loose; abundant roots; pH 5.1; gradual wavy boundary. 4 to 6 inches thick.
- B1 7 to 18 inches. Dark reddish brown (2.5YR 3/4) sandy loam with a little more fines than above, yellowish red (5YR 5/8) dry; very weak medium subangular blocky structure; loose; many roots; pH 5.2; clear smooth boundary. 7 to 12 inches thick.
 60159
- B2t 18 to 27 inches. Red (2.5YR 4/6) sandy loam, yellowish red (5YR 4/8) to red (2.5YR 4/8) dry; moderate medium subangular blocky structure breaking to moderate fine granular; firmer in place than horizon above, friable when removed; many coarse roots; up to 25 percent concretionary iron fragments 1/4 to 1/2 inch diameter in thin bands; sand grains coated throughout; pH 5.4; gradual wavy boundary. 9 to 13 inches thick.
 60160
- B3t 27 to 33 inches. Red (2.5YR 4/6) fine sandy loam, yellowish red (5YR 4/8) dry; weak coarse subangular blocky structure breaking to moderate fine granular; firm in place, fractures easily; 5 percent coarse skeleton; some coarse roots; sand grains coated; pH 5.2; clear wavy boundary. 3 to 6 inches thick.
 60161
- C 33 to 80 inches. Reddish brown (2.5YR 4/4) loamy sand, yellowish red (5YR 4/6 to 4/8) dry; massive; firm in place, friable when removed; few if any roots; 15 percent hematite and glauconite concretions; pH 5.2; abrupt irregular boundary. 36 to 48 inches thick.
 60162

R At 6 to 7 feet hard concretionary glauconitic sandstone; pH 5.0.
 Not sampled

Notes: Colors refer to moist soil unless indicated otherwise.

$\frac{1}{2}$ /This pedon is a taxadjunct because of solum color and control section texture. The Colts Neck series is in the fine-loamy, mixed, mesic family of Typic Hapludults.

PEDON CLASSIFICATION: Typic Rhodudult; fine-loamy, mixed, mesic

SOIL Colts Neck taxadjunct

SOIL Nos. B59NJ-13-3

LOCATION Monmouth County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60153 - 60157

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total			Sand					Silt				2A2 ≥ 2 Pct.	2-19 Pct.	19-76 Pct. of < 76mm	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int III (0.02-0.002)	Int II (0.2-0.02)					(2-0.1)
1-3	A2	80.0	10.1	9.9	6.9	28.2	35.3	8.2	1.4	2.6	7.5	5.9	78.6	1.00			
3-8	B1	76.8	10.4	12.8	8.1	26.3	32.7	7.9	1.8	2.5	7.9	6.3	75.0	1.00			
8-17	B2t	69.3	8.7	22.0	10.0	24.0	26.6	6.6	2.1	2.0	6.7	6.0	67.2	1.00			
17-25	B22t	62.2	9.2	28.6	7.5	19.9	25.1	6.9	2.8	2.8	6.4	7.8	59.4	1.00	tr.		
25-48	C1	69.0	8.3	22.7	8.8	21.9	27.1	8.1	3.1	2.4	5.9	8.0	65.9	1.00	tr.		
48-72	C2	Not sampled															
Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/																	
Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Water retained at suction of								Available water in/in	Field capa- city Pct.	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			8C1c (1.1) KCl	8C1a (1.1) H ₂ O
1-3	1.20	0.083	14		1.17	37.4	21.9	20.3	19.2	17.0	10.5	8.2	7.4	0.15	19.9		
3-8	0.78	0.070	11		1.26	29.4	27.9	27.0	20.2	16.9	10.3	8.1	7.2	0.14	18.0		
8-17	0.41	0.046	9		1.29	29.8	27.5	26.4	23.1	20.8	17.3	14.8	13.8	0.13	24.0		
17-25	0.28				1.33	30.0	28.3	27.8	26.8	25.7	19.2	17.7	16.4	0.13	26.4		
25-48	0.19				1.51	24.5	23.9	23.5	22.9	22.3	17.9	15.3	14.2	0.17	25.6		
Extractable bases 5B1a																	
Depth (in.)	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation			
							5A3a Sum cations	Ext. Al		CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.		
1-3	0.1	0.3	tr.	0.2		12.6	13.2			1.33		0.75		4			
3-8	tr.	0.2	tr.	0.2		12.0	12.4			0.97		0.56		3			
8-17	0.2	1.1	0.1	0.2		14.1	14.7			0.67		0.63		11			
17-25	0.1	2.7	0.1	0.2		15.3	18.4			0.64		0.57		17			
25-48	tr.	2.1	0.1	0.2		13.8	16.2			0.71		0.63		15			
Clay Fraction Analysis 7A1B-d																	
Depth (in.)	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/				Aggre- gate stabil- ity Pct.				
									Hydrau- lic conduc- tivity in/hr	Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.		Plastic index Pct.			
1-3									23.6	26.1	26.7	52.8	64				
3-8									16.2	14.2	34.9	49.1	90				
8-17									7.2	13.0	35.8	48.8	63				
17-25									4.7	11.3	37.2	48.5	61				
25-48									2.0	8.1	29.6	37.7	74				

a/ Methods refer-
enced on
methods code
sheet.

Pedon Classification: Typic Rhodudult; fine-loamy, mixed, mesic

Soil: Colts Neck taxadjunct ¹/₁

Soil No.: 859NJ-13-3

Location: Monmouth County, New Jersey. Dutch Lane Road, 1/2 mile west of Montrose; 300 feet north along abandoned roadway; 100 feet west on gentle upper slope of long hill; 50-100 feet south of crest; 20 feet above steeper slope break. Safrano woodlot.

Vegetation and land use: Woodland; white and chestnut oak, shag-bark hickory.

Slope and land form: 5 percent.

Drainage: Well drained.

Permeability: Rapid.

Parent material: Material of the Tinton sandstone (Cretaceous).

Sampled by: N. A. Willits and K. P. Wilson

Horizon and
Beltsville
Lab. No.

- O1 2 inches to 1/2. Oak and hickory leaves, very loosely tied together.
Not sampled
- O2 1/2 inch to 0. Dark reddish gray (10R 3/1) decayed leaf mat; greasy; matted fine roots; abundant microfauna feces; 20 percent mineral; abrupt smooth boundary. 0 to 1 inch thick.
Not sampled
- A1 0 to 1 inch. Dark red (2.5YR 3/6) sandy loam; weak fine granular structure; loose; common roots of all sizes; clear smooth boundary. 0 to 1 inch thick.
Not sampled
- A2 1 to 3 inches. Dark red (2.5YR 3/6) sandy loam, red (2.5YR 4/6) dry; weak fine granular structure; very friable; many roots of all sizes; clear smooth boundary. 2 to 4 inches thick.
60153
- B1 3 to 8 inches. Dark reddish brown (2.5YR 3/4) sandy loam, red (2.5YR 4/6) dry; weak fine subangular blocky structure breaking to weak fine granules; very friable; many roots; few 1/2 to 1 inch hematite concretions and fragments; gradual smooth boundary. 2 to 5 inches thick.
60154
- B2t 8 to 17 inches. Dark reddish brown (2.5YR 3/4) sandy clay loam, crushes to dark red (2.5YR 3/6), red (2.5YR 4/6) dry; moderate or weak medium subangular blocky structure breaking to moderate fine granular; slightly firmer than horizon above, very friable when removed; many roots; 10 percent 1/8 to 1/2 inch hematite concretions; pH 5.0; clear smooth boundary. 9 to 10 inches thick.
60155
- B2t 17 to 25 inches. Dark red (2.5YR 3/6) sandy clay loam, crushes to dark reddish brown (2.5YR 3/4) ped surfaces, red (2.5YR 4/8) dry; moderate medium subangular blocky structure parting to moderate fine granules; hard when dry; few roots; 20 percent 1/4 to 1 inch hematite and limonite concretions and fragments; pH 5.3; abrupt wavy boundary. 5 to 9 inches thick.
60156
- C1 25 to 48 inches. Dark reddish brown to dark red (2.5YR 3/4 to 3/6) sandy clay loam, becoming reddish yellow (5YR 6/8) and red (2.5YR 4/6) dry; stratified glauconitic and fossiliferous sandstone bedrock; hard in place, fragments cemented; no roots; many large rock fragments; pH 5.0. 20 to 30 inches thick.
60157
- C2 48 to 72 inches. Reddish brown (5YR 4/4) gravelly sandy loam, partially cemented as above.
Not sampled

Notes: Colors refer to moist soil unless indicated otherwise.

¹/₁ This pedon is a taxadjunct because the solon colors are darker than in the Colts Neck series which is in the fine-loamy mixed mesic family of the Rhodudult.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, mixed, mesic
SOIL Aura taxadjunct

SOIL Nos. 8587-8-1

LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59152 - 59156

Depth (In.)	Horizon	181b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments				
		Total		Sand					Silt					2A2 > 2 < 76 Pct.	2-19 Pct.	19-76 Pct.		
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)	
0-1 1/2	A1, A2, B	70.8	24.7	4.5	3.7	16.6	22.7	21.8	6.8	11.5	13.2	26.9	64.0	0.99	2			
1 1/2-11	A'2	64.2	27.0	8.8	3.9	14.9	20.0	18.8	6.6	11.9	15.1	25.9	57.6	0.95	10			
11-16	B'21t	60.8	26.9	12.3	4.8	15.8	18.3	16.1	5.8	11.4	15.5	23.5	55.0	0.97	5			
16-30	B'22t	58.5	23.2	18.3	3.3	14.2	18.2	16.4	6.4	10.5	12.7	23.7	52.1	0.94	10			
20-30	IIB'23	discontinuous, not sampled.																
30	IIB'24	66.0	6.8	27.2	7.7	19.6	24.8	11.5	2.4	2.6	4.2	8.5	63.6	0.97	5			
Analyses by New Jersey Agr. Exp. Sta., Rutgers University																		
Depth (In.)	6A1a Organic carbon Pct	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Bulk density g/cc	Water retained at suctions of								Available water in/in	Field capacity Pct.	8C1c (1:1) KCl	8C1a (1:1) H2O	pH
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar					
						Pct.												
0-1 1/2	1.89	0.070	27	0.4	1.09	42.6	34.7	28.5	25.3	22.4	6.5	3.9	3.5	0.231	24.7		3.7	
1 1/2-11	0.72	0.037	19	0.6	1.23	33.6	24.8	19.8	16.3	12.9	8.1	6.1	4.8	0.160	17.4		4.3	
11-16	0.32	0.034	10	1.4	1.51	22.4	17.4	15.8	13.4	11.7	8.3	6.5	4.9	0.151	14.8		4.4	
16-30	0.27			1.3	1.65	19.2	12.9	11.7	9.7	8.2	4.1	4.9	4.0	0.165	13.6		4.4	
30	0.12			1.8	1.70	17.9	14.7	12.0	11.1	10.0	9.3	9.1	8.6	0.083	13.1		4.4	
Extractable bases 5B1a																		
Depth (In.)	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation				
							5A3a Sum cations			CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH4OAc Pct.			
							meq/100 g											
0-1 1/2	tr.	0.1	tr.	0.1	0.2	8.0	8.2			1.82	0.09	0.78		2				
1 1/2-11	tr.	tr.	tr.	0.1	0.1	5.2	5.3			0.60	0.07	0.55		2				
11-16	tr.	tr.	tr.	0.1	0.1	4.7	4.8			0.39	0.11	0.40		2				
16-30	0.1	0.1	0.1	0.1	0.4	6.2	6.6			0.36	0.07	0.22		6				
30	0.3	0.4	tr.	0.1	0.8	5.2	6.0			0.22	0.07	0.32		13				
Clay Fraction Analysis 7A1b-d																		
Depth (In.)	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers					8A/Methods referenced on methods code sheet.				
									Hydraulic conductivity in/hr	Porosity 8A/		Plastic index	Aggregate stability Pct.					
										Non-capillary	Capillary				Total			
0-1 1/2									12.0	18.6	37.6	56.2		-				
1 1/2-11									5.7	20.0	30.6	50.6		90				
11-16									1.3	15.8	26.1	41.9		84				
16-30									0.8	15.0	21.1	36.1		56				
30									0.7	10.5	25.0	35.5		41				

Pedon Classification: Typic Hapludult; coarse-loamy, mixed, mesic

Soil: Aura taxadjunct/

Soil No: S56NJ-8-1

Location: Gloucester County, New Jersey. About 3,300 feet west of Janvier Church by way of dirt road to right angle intersecting dirt road, 400 feet south on latter; 20 feet east from the latter dirt road.

Vegetation and land use: White, black, red, chestnut oaks, and hickory. Suppressed trees included sassafras and post oak. Shrubs common at the site were blueberry, huckleberry, and scrub oak. Green briar and bracken fern were abundant.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Coastal plain medium textured sediments with brown sola.

Described by: M. Markley and G. Quakenbush.

Horizon and

Beltsville

Lab. No.

- O1 1 to 1/2 inch. Undecomposed oak leaves. 0 to 1 inch thick.
Not sampled
- O2 1/2 inch to 0. Very dusky red (2.5YR 2/2) decomposed leaves mixed with gray sand grains in the lower part; mycelia extending to 2 inches in places. 0 to 2 inches thick.
Not sampled
- A1 0 to 1/2 inch. Very dark gray (10YR 3/1) sandy loam; weak fine granular structure; friable; mycelia common. 0 to 1 inch thick.
- A2 1/2 to 1 inch. Dark gray (10YR 4/1) sandy loam; weak fine granular structure; friable; less than 3 percent of 1/2 to 1 inch rounded quartz pebbles; mycelia common; clear wavy boundary. 1/2 to 2 inches thick.
- B 1 to 1-1/2 inches. Dark brown to very dark grayish brown (7.5YR 3/2 to 10YR 3/2) sandy loam; massive; friable; some mycelia; clear wavy boundary. 1/2 to 4 inches thick.
59152
- A'2 1-1/2 to 11 inches. Yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; friable, nonsticky; 3 percent of 1/2 to 2 inch rounded quartz pebbles; many large roots; clear smooth boundary. 6 to 10 inches thick.
- B'21t 11 to 16 inches. Yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; slightly sticky; many fine roots; thin patchy clay films on peds and grains; clear wavy boundary. 4 to 6 inches thick.
59154
- B'22t 16 to 20 inches. Yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; friable; very slightly brittle in place; 5 to 10 percent 1/2 to 1 inch rounded quartz gravel.
59154

- IIB'23 20 to 30 inches. Lightly variegated, yellowish brown (10YR 5/6) brown (7.5YR 5/4) and strong brown (7.5YR 5/6) loamy sand with bodies of sandy loam; single grain; loose; few roots; 3 percent of rounded quartz gravel; clear broken boundary. 0 to 10 inches thick.
Not sampled

Pedon Classification: Typic Hapludult; coarse-loamy, mixed, mesic

Soil: Freehold taxadjunct 1/

Soil No.: 856NJ-3-1

Location: Burlington County, New Jersey. 1/2 mile north of Jacksonville. 100 feet east of road and 50 feet north of field into woods. Photo CMU-27-149.

Vegetation and land use: Hardwood woodland, mostly yellow poplar with some red oak, occasional beech. Some dogwood and red maple.

Drainage: Well drained.

Permeability: Moderate.

Sampled by and date: N. A. Willits and M. L. Markley. December 26, 1956.

Horizon and

Beltsville

Lab. No.

O1 3 inches to 1. Leaves of the past season, dominantly yellow poplar, red oak, covering the ground.
Not sampled

O2 1 inch to 0. Decayed leaves, black.
Not sampled

A1 0 to 4-1/2 inches. Very dark grayish brown (10YR 3/2 to 3/3) sandy loam; very fluffy, weak fine granular structure; very friable; one earthworm and cast observed; and holes and old root cavities common; thick roots concentrated in this horizon; abrupt smooth boundary. 3 to 6 inches thick.
59236

A2 4-1/2 to 12 inches. Yellowish brown (10YR 5/4 to 5/6) sandy loam; massive; slightly firm in place but friable; glauconite apparent but not abundant; roots most common at top of A2; pores common; very faint mottles in circles 2 to 3 inches in diameter just above B horizon; old root channels filled with A1 material. 6 to 8 inches thick.
59237

B1 12 to 20 inches. Yellowish brown (10YR 5/8) sandy loam, slightly redder than A2; weak medium subangular blocky structure; friable, sticky; contains some mica; thick roots concentrated in this horizon; clear wavy boundary. 7 to 9 inches thick.
59238

B2t 20 to 30 inches. Yellowish brown (10YR 5/8) fine sandy loam, slightly redder than B1; moderate medium subangular blocky structure; friable, sticky; contains glauconite; small roots common; clear wavy lower boundary. 10 to 12 inches thick.
59239

B3t 30 to 36 inches. Yellowish brown (10YR 5/8) sandy loam, slightly darker than B2; weak medium subangular blocky structure; slightly firm in place, friable when removed; glauconite common; small roots less abundant than in B2; clear wavy lower boundary; 4 to 5 inches thick.
59240

IIC1 36 to 38 inches. Yellowish brown (10YR 5/6) loamy sand, dark grains give peppery appearance; single grain; loose.
Not sampled

IIC2 38 to 42 inches. Dark yellowish brown (10YR 4/6) loamy sand, redder than IIC1; friable; roots still present; clear wavy boundary.
59241

IIIC3 42 to 63 inches. Alternating horizons of loamy sand and sandy loam; slightly mottled. Fragments of ironstone prohibited boring beyond 63 inches.
59242

Notes: Colors refer to moist soil.

1/ This pedon is a taxadjunct because it is in the coarse-loamy family particle size class, whereas the Freehold series is in the fine-loamy class. The divergence is by 2.5 percent clay.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, mixed, mesic

SOIL Matapeake taxadjunct

SOIL Nos. S57NJ-12-1

LOCATION Middlesex County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 57454 - 57458

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total		Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Silt		Int. II (0.2-0.02)		(2-0.1)	2A2 > 2 < 76 Pct.	2-19	19-76 Pct. of < 76mm
		Sand (2-0.05)	Silt (0.05-0.002)							Int. III (0.02-0.002)	Int. II (0.2-0.02)						
0-5	All-A13	26.9	62.4	10.7	0.8	4.0	5.3	8.0	8.8	30.0	32.4	42.7	18.1	0.97	9		
5-13	A2	18.9	69.3	11.8	0.6	2.7	3.2	4.9	7.5	31.9	37.4	42.0	11.4	0.93	14		
13-21	B21t	15.9	62.8	21.3	0.5	1.9	2.4	3.9	7.2	28.2	34.6	37.4	8.7	0.99	2		
21-31	B22tg	38.3	46.6	15.1	1.2	6.4	7.7	11.9	11.1	24.1	22.5	41.4	27.2	0.98	4		
31-63	TIC	58.5	26.7	14.8	7.9	13.7	15.9	14.4	6.6	14.1	12.6	26.8	51.9	0.68	40		
Analyses by New Jersey Agr. Exp. Sta., Rutgers University A/																	
Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Bulk density g/cc	Water retained at suction of								Available water in/in	Field capacity Pct.	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			BC1c (1:1) KCl	SC1a (1:1) H2O
						Pct.											
0-5	6.7	0.271	25	1.1	0.78	73.7	57.9	53.7	48.1	41.5	15.3	11.1	5.5	0.28	41.0		4.0
5-13	0.62	0.047	13	1.1	1.20	36.8	29.2	28.7	23.6	21.6	13.2	7.8	6.1	0.25	26.6		4.3
13-21	0.31			2.0	1.38	29.4	25.5	24.8	22.9	21.5	15.4	11.0	9.2	0.21	24.1		4.3
21-31	0.10			1.5	1.61	23.1	21.6	20.8	19.6	18.4	13.0	9.8	8.6	0.20	21.0		4.0
31-63	0.06			2.1	1.86	13.3	11.4	10.9	10.0	9.2	6.8	5.2	4.3	0.14	10.5		4.9
Extractable bases 5B1a																	
Depth (in.)	6N2d Ca meq/100 g	6O2b Mg	6P2a Na	6Q2a K	Sum	6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			BD3 Ca/Mg	Base saturation			
							5A3a Sum cations			CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH4 OAc Pct.		

Pedon Classification: Typic Hapludult; coarse-loamy, mixed, mesic

Soil: Matapeake taxadjunct ^{1/}

Soil No.: S57NJ-12-1

Location: Middlesex County, New Jersey. Hunkale woodlot, 1 mile east of Dayton, on Dayton-Jamesburg Road. North side of road, 100 feet west of eastern boundary of woodlot, 200 feet into woodland.

Vegetation and land use: Woodland of white oak, red oak, occasional beech and hickory, light understory of sassafras, maple leaf viburnum.

Slope and land form: 1 percent.

Drainage: Moderately well drained to well drained.

Permeability: Moderate.

Parent material: Silty mantle overlying (post-Jerseyan, pre-Wisconsin) gravelly and sandy, cross bedded deposits.

Sampled by and date: N. A. Willets and K. P. Wilson. March 25, 1957.

Horizon and

Beltsville

Lab. No.

O1 2 inches to 1/2. Loose leaves from last leaf fall, undecayed; almost entirely oak leaves, not tied to underlying layer.

O2 1/2 inch to 0. Leaves from previous fall, moist, matted, partially decomposed. Tied together and to underlying A11 by mycelia and fine rootlets; these leaves can be easily ground up by fingers.

A11 0 to 1/2 inch. Black (10YR 2/1) silt loam; weak fine granular structure; loose, fluffy when dry; matted with fine roots; this layer has been disturbed and mixed with the A12 and A13 in spots on about 1 foot centers approximately 2 inches in diameter; pH 4.2; abrupt irregular boundary. 1/2 to 1/4 inch thick.

A12 1/2 to 2 inches. Dark brown to dark yellowish brown (10YR 4/3 to 4/4) silt loam; weak medium crumb structure parting to weak fine crumb; very friable to loose; abundant fine roots; only very fine quartz sand and organic matter visible; scattered very fine white mica; many fine to coarse pores; clear irregular boundary. 1 to 3 inches thick.

A13 2 to 5 inches. Dark yellowish brown (10YR 4/4) silt loam; weak medium or coarse crumb structure parting to weak fine crumb; loose to very friable; scattered 1/2 to 1 inch quartz pebbles; only very fine, clean quartz sand visible; scattered very fine white mica; less organic matter than above; many pores; clear wavy boundary. 1 to 4 inches thick.

A2 5 to 13 inches. Yellowish brown (10YR 5/6) slightly finer textured silt loam; weak medium subangular blocky structure; friable; many fine pores, 0.5 mm average, many 1 mm; mainly fine sand size, clean to clear quartz grains with scattered fine white mica are only minerals identified; 15 percent quartz pebbles up to 1 inch in diameter; all peds appear coated with finely divided silica particles; fine roots and root hairs common; pH 4.7; gradual smooth boundary. 6 to 8 inches thick.

B21t 13 to 21 inches. Strong brown (7.5YR 5/6) silt loam; few medium faint mottles; moderate medium subangular blocky structure; friable, slightly sticky; many 0.5 to 1 mm pores; continuous clay films redder than ped interiors; about 1 percent fine white mica and a very few grains which are dark, the rest are medium to fine quartz sand, rounded, frosted, and not clay coated; roots common; 1/2 to 1 inch quartz pebbles; pH 4.4; gradual wavy boundary. 5 to 8 inches thick.

B22tg 21 to 31 inches. Yellowish brown (10YR 5/6) loam with common medium faint brown (10YR 5/3) mottles; moderate medium or strong subangular blocky structure; slightly firm; rounded sand grains not coated with oxides; less than 1 percent dark dull rounded fine sand grains; 1

percent fine to medium, white mica; very few fine roots penetrate peds; clay films continuous on peds; pH 3.4; clear broken boundary. 0 to 12 inches thick.

IIC 31 to 63 inches. Strong brown (7.5YR 5/6) gravelly sandy loam; massive; 30 percent 1/2 to 2 inch quartz pebbles which mask structure; coarse to medium sand, rounded, frosted, and coated with clay; some roots; 1

FEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic

SOIL - Downer sandy loam

SOIL Nos. 857NJ-8-1

LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59179 - 59184

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1												3B2 Cm	Coarse fragments 3B1		
		Total			Sand					Silt					2A2 ≥ 2 < 76 Pct.	2-19 Pct.	19-75 Pct. of < 76mm
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Vary fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)				
1/2-1	A2	71.5	25.0	3.5	3.7	19.4	19.9	20.7	7.8	12.1	12.9	29.7	63.7	1.00	tr.		
1-1 1/2	B2	Not sampled															
1 1/2-11	A'2	70.1	25.1	4.8	3.8	18.5	18.2	20.0	9.6	11.7	13.4	30.8	60.5	0.97	6		
11-18	B'21c	66.0	27.4	6.6	2.8	15.6	17.4	20.2	10.0	12.9	14.5	32.6	56.0	0.95	8		
18-25	B'22c	69.6	21.7	8.7	3.0	17.0	17.0	21.0	11.6	10.6	11.1	33.1	58.0	0.83	24		
25-32	B'23c	83.3	10.3	6.4	9.2	24.1	17.9	21.3	10.8	7.0	3.3	29.1	72.5	0.66	43		
32-54	T1C1	94.4	1.8	3.8	10.8	29.6	23.1	28.4	2.5	1.3	0.5	12.7	91.9	0.95	8		
Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/																	
Depth (in.)	6A1c Organic carbon Pct.	Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Water retained at suctions of								Available water in/in	Field capacity Pct.	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			8B1c (1:1) KCl	8C1a (1:1) H ₂ O
1/2-1	3.54	0.138	26		1.21	32.2	23.8	22.2	19.6	16.6	5.9	3.5	2.8	0.23	22.2		
1-1 1/2	Not sampled																
1 1/2-11	0.56	0.038	18		1.44	23.9	15.7	14.2	11.5	8.9	6.2	3.6	2.9	0.15	13.1		
11-18	0.17				1.57	18.7	14.0	12.6	11.1	9.1	6.3	3.6	2.8	0.16	12.9		
18-25	0.12				1.72	13.6	10.0	8.9	7.4	5.2	6.4	4.4	3.7	0.12	10.1		
25-32	0.08				1.78	11.1	7.1	6.3	5.6	4.6	3.7	3.2	2.7	0.09	6.7		
32-54	0.04				1.73	15.0	7.8	5.5	4.3	8.7	1.9	1.6	1.4	0.08	6.1		
Extractable bases 5B1a																	
Depth (in.)	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum meq/100 g	6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation			
							5A3a Sum cations			CEC Sum	Ext. Iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.		
1/2-1	0.4	0.2	0.1	0.1	0.8	1.2	2.0						0.57		0.80		
1-1 1/2	Not sampled																
1 1/2-11	0.6	tr.	0.1	0.1	0.8	3.6	4.4						0.92		0.60		
11-18	0.4	tr.	tr.	0.1	0.5	2.4	2.9						0.44		0.42		
18-25	0.3	0.2	tr.	0.1	0.6	3.2	3.8						0.44		0.43		
25-32	0.1	0.1	tr.	tr.	0.2	2.8	3.0						0.33		0.42		
32-54															0.37		
Clay Fraction Analysis 7A1b-d																	
Depth (in.)	Mt.	Cl.	Vm.	M.	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/								
									Hydrau- lic conductivity in/hr	Non- capillary Porosity Pct.	Capillary Porosity Pct.	Total Porosity Pct.	Plastic index Pct.	Aggregate stability Pct.			
1/2-1									11.2	25.6	20.2	45.8					
1-1 1/2	Not sampled																
1 1/2-11									5.1	17.0	22.7	39.7			92		
11-18									3.5	12.7	21.2	33.9			78		
18-25									1.4	10.6	17.8	28.4			63		
25-32									2.5	12.1	12.9	25.0	N.P.		60		
32-54									8.7	15.8	13.5	29.3	N.P.		-		

a/ Methods refer-
enced in
Methods Code
Section.

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic

Soil: Downer sandy loam

Soil No.: S57NJ-8-1

Location: Gloucester County, New Jersey. 2 miles south east of Williamstown, 600 feet north of South Branch of Whitehall Creek, 110 feet east of New Brooklyn-Malaga Road; property of Charles Faubel.

Vegetation and land use: Woodland chiefly of red and white oak.

Drainage: Well drained.

Permeability: Estimated moderately rapid or moderate.

Parent material: Coastal plain very sandy sediments lacking or without ordinarily field-recognizable glauconite.

Described by: M. Markley

Horizon and
Beltsville
Lab. No.

O1 3 inches to 1. Undecayed, partly matted oak leaves.

Not sampled

O2 1 inch to 0. Broken, matted leaf material, fibrous.

Not sampled

A1 0 to 1/2 inch. Black (10YR 2/1) sandy loam, very dark with organic matter; abrupt wavy boundary.

Not sampled

A2 1/2 to 1 inch. Gray (10YR 5/1) sandy loam; abrupt wavy boundary.

59179

B2 1 to 1-1/2 inches. Dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; abrupt wavy boundary. 1/2 to 1 inch in thickness.

Not sampled

A'2 1-1/2 to 11 inches. Yellowish brown (10YR 5/4) sandy loam; massive; very friable; 3 percent quartz pebbles to 1/2 inch in diameter; clear wavy boundary. 10 to 14 inches thick.

59180

B'21t 11 to 18 inches. Yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky

59181

6 to 9 inches thick.

B'22t 18 to 25 inches. Dark yellowish brown (10YR 4/4) gravelly sandy loam; weak medium subangular blocky structure; friable; 25 percent quartzose gravel; clear wavy boundary. 6 to 8 inches thick.

59182

B'23t 25 to 32 inches. Strong brown (7.5YR 5/8) to dark yellowish brown (10YR 4/4) gravelly loamy sand; single grain; firm; 1 to 2 inch bands massive and firmer than the matrix; 25 percent quartzose gravel coated clay films; gradual wavy boundary. 0 to 10 inches thick.

59183

IIC1 32 to 54 inches. Yellowish brown (10YR 5/6) sand with 1 to 2 inch bands dark brown (7.5YR 4/4) loamy sand; single grain; generally firm, in places loose; gradual wavy boundary. 10 to 40 inches thick.

59184

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic
SOIL: Downer sandy loam SOIL Nos. S57NJ-8-2 LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 59185 - 59189

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1												3B2 Cm	3B1 Coarse fragments		
		Total													2A2 > 2 < 76 Pct.	2-19 Pct.	19-76 Pct. of < 76mm
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Silt		(2-0.1)					
0-1 1/2	A'2	71.0	25.5	3.5	4.5	19.7	20.3	19.5	7.0	11.6	13.9	27.7	64.0	0.99	2		
1 1/2-14	A'2	63.0	29.9	7.1	6.0	16.1	15.2	16.1	9.6	12.7	17.2	30.6	53.4	0.98	3		
14-24	B'21t	61.9	27.2	10.9	4.7	15.4	14.9	16.8	10.1	11.7	15.5	30.4	51.8	0.95	9		
24-32	B'22t	78.4	13.6	8.0	13.0	22.9	16.0	16.1	10.4	6.4	7.2	25.6	68.0	0.77	31		
32-66	IIC2	87.2	8.0	4.8	21.4	32.5	18.2	9.2	5.9	4.3	3.7	14.0	81.3	0.63	47		

Depth (in.)	6A1a Organic carbon Pct.	5B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University b/ Water retained at suctions of								Available water in/in	Field capa- city Pct.	pH		
						Pct.										8D3 Ca/Mg	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar					
0-1 1/2	2.60	0.097	27		1.33	26.6	17.8	15.7	14.4	12.3	6.7	4.9	3.7	0.19	18.3		5.6	
1 1/2-14	0.64	0.039	16		1.37	24.2	20.3	15.5	14.2	13.4	7.4	5.1	4.2	0.15	15.0		5.2	
14-24	0.20				1.55	18.3	13.5	13.0	12.2	11.0	7.2	6.5	4.5	0.11	11.5		5.0	
24-32	0.12				1.73	12.6	8.0	5.9	5.3	4.6	4.3	3.6	3.1	0.11	8.6		5.0	
32-66	0.04				1.77	10.5	5.7	5.3	5.0	4.2	3.1	2.5	2.1	0.08	6.0		4.0	

Depth (in.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	Ext. Al		CEC Sum	Ext. iron	15-bar water		8C3 Sum cations Pct.	8C1 NH ₄ OAc Pct.
	meq/100 g														
0-1 1/2	0.2	0.2	0.1	0.1	0.6	9.2	9.8				2.80		1.06		6
1 1/2-14	0.1	0.1	tr.	0.1	0.3	6.0	6.3				0.89		0.59		5
14-24	tr.	0.1	0.1	0.1	0.3	5.8	6.1				0.56		0.41		5
24-32	tr.	0.1	0.1	0.1	0.3	3.8	4.1				0.51		0.39		7
32-66	tr.	0.2	tr.	0.1	0.3	1.7	2.0				0.24		0.44		15

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers					
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Porosity b/			Plastic index	Aggregate stabil- ity b/	
									Hydrau- lic conduc- tivity in/hr	Non- capil- lary Pct.	Capil- lary Pct.			Total Pct.
0-1 1/2									6.9	16.8	23.7	40.5		90
1 1/2-14									6.6	13.1	27.8	40.9		94
14-24									3.2	13.2	21.7	34.9		90
24-32									4.5	11.8	15.7	27.5	N.P.	83
32-66									2.0	15.6	10.3	25.9	N.P.	60

a/ Micro Podsol.

b/ Methods referenced on methods code sheet.

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic

Soil: Downer sandy loam

Soil No.: S57NJ-8-2

Location: Gloucester County, New Jersey. Southwest of Williamstown, about 400 feet north of Hell Branch, 150 feet northwest of road; George Wilson property.

Vegetation and land use: Good stand of white oak, red oak, pitch pine, and black oak.

Drainage: Well drained.

Permeability: Moderately rapid.

Parent material: Coastal plain sandy sediments.

Described by: M. Markley

Horizon and

Beltsville

Lab. No.

- O1 3 inches to 0. Last year's leaves, broken and matted in the lower inch.
Not sampled
- A1¹ 0 to 1/2 inch. Black (10YR 2/1) sandy loam; weak fine granular structure; very friable; clear wavy boundary. 0 to 1 inch thick.
59185
- A2 1/2 to 1 inch. Gray (10YR 5/1) sandy loam; weak fine granular structure; very friable; clear wavy boundary. 1/2 to 1 inch thick.
Not sampled
- B2 1 to 1 1/4 inches. Dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; abrupt broken boundary. 0 to 1 inch thick.
Not sampled
- A'2 1 1/2 to 1 3/4 inches. Yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; considerable mycelia; 1 percent quartz pebbles up to 1/4 inch diameter; clear smooth boundary. 12 to 13 inches thick.
59186
- B'21t 1 1/4 to 2 1/4 inches. Dark yellowish brown (10YR 4/4) sandy loam but with more clay than horizon above; becoming sandier in lower part; weak medium or coarse subangular blocky structure; friable and nonsticky; 3 percent quartz pebbles; gradual wavy boundary. 9 to 13 inches thick.
59187
- B'22t 2 1/4 to 3 1/2 inches. Dark brown (7.5YR 4/4) gravelly loamy sand; single grain; friable to loose; 20 percent pebbles; gradual wavy boundary. 0 to 20 inches thick.
59188
- IIC1² 32 to 42 inches. Dark yellowish brown (10YR 4/4) gravelly loamy sand, single grain; firm, slightly brittle; 20 percent pebbles; clay coating around pebbles; gradual irregular boundary. 5 to 40 inches thick.
Not sampled
- IIC2 42 to 66 inches. Yellowish brown (10YR 5/6) loamy sand becoming coarse loamy sand below 60 inches; single grained; 10 percent quartz pebbles.
59189

Notes: ¹ A1, A2, and B2 from 0 to 1 1/2 inches combined in one sample.
² IIC1 and IIC2 from 32 to 66 inches combined in one sample.
Roots freely developed throughout to 32 inches diminishing below that depth in the B23. Colors refer to moist soil.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic
 SOIL Downer loamy sand SOIL Nos. S57NJ-8-3 LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 59190 - 59194

Depth (in.)	Horizon	181b Size class and particle diameter (mm) SA1													3B2 Cm	3B1 Coarse fragments		
		Total			Sand						Silt					2A2 2 < 76 Pct.	2-19	19-76 Pct. of < 76mm
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine, (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)	(2-0.1)					
Pct. of < 2 mm																		

Soil: Downer loamy sand

Soil No.: S57NJ-8-3

Location: Gloucester County, New Jersey. About 2 miles southeast of Aura, 2,100 feet southeast of intersection of county road 538 and Aura-Porchtown Road; 100 feet east of Aura-Porchtown Road; property of Mrs. Earl Gant.

Vegetation and land use: Hardwood forest, white oak, red oak, pitch pine, black oak, black gum, holly, hickory, sassafras, red cedar, dogwood, mountain laurel and some sheep laurel.

Drainage: Well drained.

Permeability: Generally rapid (estimate).

Parent material: Coastal plain very sandy sediments.

Described by: M. Markley

Horizon and
Beltsville
Lab. No.

O1 Not sampled	4 inches to 1.	Matted, undecayed oak leaves.
O2 Not sampled	1 inch to 0.	Decayed leaves.
A1 Not sampled	0 to 1/2 inch.	Black (10YR 2/1) loamy sand; very dark with organic matter.
A2 59190	1/2 to 3 inches. 2 to 4 inches thick.	Gray (10YR 5/1) loamy sand; single grain; loose; clear wavy boundary.
B2 59191	3 to 4 inches. 0 to 1 inch thick.	Dark gray (10YR 4/1) loamy sand; single grain; friable; abrupt wavy boundary.
A'2	4 to 13 inches. 8 to 10 inches thick.	Yellowish brown (10YR 5/6) loamy sand; very weak fine granular structure; very friable; less than 5 percent quartz pebbles; some mycelia; clear smooth boundary.
B't 59193	13 to 24 inches. 10 to 13 inches thick.	Yellowish brown (10YR 5/6) sandy loam; massive; friable; 10 percent quartz pebbles; clear smooth boundary.
IIC1 Not sampled	24 to 30 inches. 3 to 40 inches thick.	Yellowish brown (10YR 5/6) loamy sand; single grain; loose; 10 percent quartz pebbles less than 1/2 inch in diameter; clear smooth boundary.
IIC2 59194	30 to 46 inches.	Yellowish brown (10YR 5/6) sand with balls and 1 to 2 inch discontinuous bands of dark yellowish brown (10YR 4/4) loamy sand; single grain; loose, firm and brittle in lenses and balls; 5 percent quartz pebbles; clear wavy boundary.
IIC3 Not sampled	46 to 84 inches.	Yellowish brown (10YR 5/4) sand; single grain; loose; 5 percent pebbles.

Notes: Colors are for moist soil.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic

SOIL Downer loamy sand

SOIL Nos. 858WJ-5-1

LOCATION Cape May County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59269 - 59276

Depth (In.)	Horizon	1B1b Size class and particle diameter (mm) SA1											3B2 Cm	Coarse fragments 3B1			
		Total												2A2 V 2 < 76 Pct.	2-19 Pct.	19-76 Pct. of < 76mm	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
0-2	A1	77.9	19.1	3.0	2.3	19.2	27.5	26.2	2.7	8.5	10.6	21.2	75.2	1.00	tr.		
2-13	A2	73.1	23.2	3.7	2.0	16.2	24.0	26.8	4.1	10.3	12.9	26.5	69.0	1.00	tr.		
13-19	A3	70.2	24.9	4.9	1.6	15.8	22.9	25.4	4.5	10.6	14.3	26.4	65.7	1.00	tr.		
19-21	B1	67.1	26.1	6.8	1.5	14.5	21.7	24.9	4.5	10.7	15.4	26.3	62.6	1.00	tr.		
21-28	B2t	61.6	22.5	15.9	0.9	12.2	19.6	24.3	4.6	9.4	13.1	25.3	57.0	0.99	1		
28-32	B3t	75.4	12.1	12.5	1.8	11.3	21.5	33.5	7.3	6.1	6.0	30.2	68.1	0.96	7		
32-38	C1	93.3	2.9	3.8	3.2	18.6	28.5	36.6	6.4	2.1	0.8	25.9	86.9	0.98	3		
38-43	C2	82.5	14.3	3.2	0.8	9.5	22.7	39.7	9.8	10.5	3.8	39.0	42.8	1.00	tr.		

Depth (In.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										pH				
					Water retained at suction of											Available water in/in	Field capacity Pct.	8C1c (1:1) KCl	8C1a (1:1) H2O
					Bulk density g/cc	0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar	21.0					
0-2	3.08	0.129	24	0.3	1.26	33.0	26.4	22.3	20.1	18.7	5.1	3.5	2.5	0.140	21.0		3.9		
2-13	0.80	0.055	14	0.4	1.40	28.0	20.6	18.3	17.1	15.6	4.9	2.8	1.7	0.150	11.4		4.7		
13-19	0.16			0.4	1.60	19.0	14.1	12.1	10.4	9.9	4.9	2.8	1.7	0.150	11.4		4.7		
19-21	0.11			0.6	1.63	18.5	13.5	12.2	11.1	10.5	5.6	3.3	2.3	0.158	12.1		4.7		
21-28	0.16			1.2	1.60	18.2	16.0	14.1	13.1	11.8	8.4	6.4	5.5	0.125	13.5		4.1		
28-32	0.08			0.8	1.64	18.5	13.3	10.5	9.6	8.6	6.1	4.8	7.1	0.115	10.5		4.6		
32-38	0.00			0.4	1.67	17.8	10.0	8.1	5.7	4.4	1.9	1.5	1.2	0.197	7.6		4.7		
38-43	0.04			0.3	1.66	18.9	13.1	11.2	9.0	8.6	1.9	1.4	1.4	0.075	6.3		5.0		

Depth (In.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratio to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	CEC Sum		Ext. Iron	15-bar water	5C3 Sum cations Pct.		6C1 NH4OAc Pct.	
	meq/100 g														
0-2	0.7	tr.	0.1	0.2	1.0	9.4	10.3			3.43	0.10			9	
2-13	0.2	0.4	tr.	0.1	0.7	5.6	6.3			1.70	0.11	0.68		11	
13-19	0.4	0.1	0.1	0.1	0.7	2.5	3.2			0.65	0.08	0.35		22	
19-21	0.2	0.1	0.1	0.2	0.6	3.3	3.9			1.74	0.09	0.34		15	
21-28	tr.	0.2	tr.	0.1	0.3	7.5	7.8			0.49	0.08	0.35		4	
28-32	tr.	0.6	tr.	0.1	0.7	4.6	5.3			0.42	0.06	0.57		13	
32-38	tr.	0.2	tr.	0.1	0.3	1.4	1.7			0.53	0.11	0.32		18	
38-43	tr.	0.2	tr.	0.1	0.3	1.4	1.7			0.09	0.44			18	

Depth (In.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers a/					Methods referenced on methods code sheet.
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Porosity a/					
									7A2 X-ray	7A3	Hydraulic conductivity in/hr	Non-capillary Pot.	Capillary Pot.	
0-2									7.5	15.5	34.7	50.2		
2-13									3.2	16.7	28.2	44.9		90
13-19									0.8	14.6	22.4	37.0		57
19-21									0.6	14.7	22.0	36.7		49
21-28									0.8	13.1	25.7	38.8		43
28-32									2.5	13.7	20.9	34.6		31
32-38									6.1	15.9	16.6	32.5	N.P.	38
38-43									1.3	10.6	21.8	32.4	N.P.	57

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic

Soil: Downer loamy sand

Soil No.: S58NJ-5-1

Location: Cape May County, New Jersey. Approximately 1-1/2 miles west of Bennett where two generally westward roads fork and intersect a generally north-south road, the one western road swinging northward in a short distance; in woods northwest of the intersection, about 100 feet in the woods.

Vegetation and land use: Forested with hardwoods predominant--by oak, some hickory, dogwood, sassafras, and holly.

Slope and land form: 0 to 1 percent.

Drainage: Well drained.

Permeability: moderate.

Parent material: Quaternary coastal plain sediments.

Described by: G. A. Quakenbush

Horizon and

Beltsville

Lab. No.

O1 Not sampled	4 inches to 1. Last year's leaves, hardwoods, mostly oak.
O2 Not sampled	1 inch to 0. Dark reddish brown (5YR 2/2) decayed organic matter, aggregated and matted by roots, containing a sprinkling of sand grains.
A1 59269	0 to 2 inches. Pale brown (10YR 6/3) loamy sand; single grain; friable; clear irregular boundary.
A2 59270	2 to 13 inches. Yellowish brown (10YR 5/4) sandy loam, light olive brown (2.5Y 5/4) dry; massive; friable; clear wavy boundary.
A3 59271	13 to 19 inches. Variegated 30 percent yellowish brown (10YR 5/4) and 70 percent strong brown (7.5YR 4/6) sandy loam, pale brown (10YR 6/3) dry; massive; friable, 80 percent firm in place; noticeably vesicular; the redder hue goes with the firmer soil; clear smooth boundary.
B1 59272	19 to 21 inches. Variegated over 90 percent strong brown (7.5YR 4/6) with yellowish brown (10YR 5/4) sandy loam, light yellowish brown (10YR 6/4) dry; single grain; loose.

90 percent firm in place; slightly vesicular; clear smooth boundary.

B2t 59273	21 to 28 inches. Strong brown (7.5YR 4/6) sandy loam, brown (10YR 5/3) dry; massive; friable; slightly sticky, slightly plastic; occasional quartz pebble; occasional irregular-shaped firm lumps over an inch in diameter; bridging between grains but no coats on pebbles; clear smooth boundary.
B3t 59274	28 to 32 inches. Strong brown (7.5YR 4/8) sandy loam, dark brown (7.5YR 4/4) dry; massive; friable; 5 percent small quartz pebbles; clear smooth boundary.
C1 59275	32 to 38 inches. Strong brown (7.5YR 4/8) sand; single grain; loose; occasional pebbles; clear smooth boundary.
C2 59276	38 to 43 inches plus. Yellowish brown (10YR 5/6) loamy sand, light yellowish brown (10YR 6/4) dry; single grain; loose.

Notes: Colors refer to moist soils unless indicated otherwise.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic

SOIL Downer loamy sand SOIL Nos. 858NJ-5-2 LOCATION Cape May County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59277 - 59282

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1													3B2 Cm	Coarse fragments 3B1				
		181b Total				Sand					Silt					2A2 > 2 < 76 Pct.	2-19 Pct.	19-76 Pct.		
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay ($<$ 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)	(2-0.1)							
0-7	Apl, Ap2	78.6	17.3	4.1	2.3	8.2	14.8	48.6	4.7	5.8	11.5	38.5	73.9	1.00	tr.					
7-16	A2	77.5	17.7	4.8	2.9	6.1	13.2	51.0	4.3	4.7	13.0	37.9	73.2	0.97	6					
16-19	B1	71.9	19.5	8.6	3.7	5.7	13.1	45.8	3.6	6.1	13.4	36.0	68.3	0.92	12					
19-27	B2t	65.4	16.5	18.1	2.6	4.5	10.7	44.4	3.2	5.3	11.2	34.7	62.2	0.90	16					
27-37	B3t	80.6	5.9	13.5	1.5	4.4	12.1	58.5	4.1	2.0	3.9	42.9	76.5	0.96	6					
37	IIC	94.7	0.3	5.0	0.6	2.2	10.5	75.9	5.5	0.3	0.0	53.5	89.2	0.99	2					
Analyses by New Jersey Agr. Exp. Sta., Rutgers University &/																				
Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Water retained at suctions of										Available water in/in	Field capa- city Pct.	8C1c (1:1) KCl	8C1e (1:1) H ₂ O	pH	
					Bulk density g/cc	Pct.														
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar							
0-7	1.35	0.104	13	0.3	1.17	37.4	24.1	19.6	16.0	14.7	6.0	5.0	4.4	0.12	14.9		4.4			
7-16	0.32	0.041	8	0.4	1.48	22.8	14.9	11.7	9.5	8.6	4.5	2.6	2.0	0.13	10.5		4.5			
16-19	0.19			0.5	1.58	20.6	15.4	12.6	10.2	9.5	6.1	4.0	2.9	0.13	11.0		4.4			
19-27	0.29			1.1	1.58	21.3	16.6	13.3	11.3	10.6	9.4	7.5	6.4	0.10	12.1		4.2			
27-37	0.15			0.8	1.55	23.3	16.5	10.3	9.0	8.0	7.1	5.8	5.2	0.07	9.8		4.4			
37	0.04			0.3	1.46	26.3	19.7	5.4	4.6	3.9	2.6	2.3	2.0	0.07	6.9		4.7			
Extractable bases 5B1a																				
Depth (in.)	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	6H2e Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8O3 Ca/Mg	Base saturation						
							5A3a Sum cations	Ext. Al		CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.					
																meq/100 g				
0-7	0.3	0.2	tr.	0.1	0.6	6.6	7.2		1.76	0.07	1.07		8							
7-16	0.2	0.1	tr.	0.1	0.4	3.3	3.7		1.27	0.08	0.42		11							
16-19	0.1	tr.	tr.	0.1	0.2	3.3	3.5		0.41	0.06	0.34		6							
19-27	0.2	0.2	0.1	0.1	0.6	8.0	8.6		0.47	0.06	0.35		7							
27-37	0.2	0.3	tr.	0.1	0.6	5.4	6.0		0.44	0.06	0.39		10							
37	0.2	0.1	tr.	0.1	0.4	1.9	2.3		0.46	0.06	0.40		17							
Clay Fraction Analysis 7A1b-d																				
Depth (in.)	Mt.	Chl.	Vm	M ₁	Int	Qtz	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers University &/					Methods refer- enced on methods code sheet.						
									Hydrau- lic conductivity in/hr	Porosity a/		Plastic index	Aggre- gate stability Pct.							
										Non- capil- lary	Capil- lary				Total					
0-7									12.6	22.5	28.6	51.1		83						
7-16									1.7	19.9	22.2	42.1		88						
16-19									0.4	13.2	24.1	37.3		48						
19-27									2.2	11.8	25.9	37.7		43						
27-37									1.4	12.4	25.6	38.0		20						
37									9.3	10.3	30.2	40.5	N.P.	11						

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic

Soil: Downer loamy sand

Soil No.: S58NJ-5-2

Location: Cape May County, New Jersey. One mile north of Dias Creek, eastward from county highway 47 about 200 yards on Hand Avenue, in woods on north side of Hand Avenue, in southwest corner of the woods about 100 feet from the field and 100 feet from the road.

Vegetation and land use: Predominantly red and black oak. Some white oak, sassafras, dogwood and cherry.

Slope and land form: 0 to 1 percent.

Drainage: Well drained.

Permeability: Moderately rapid.

Parent material: Quaternary coastal plain sediments.

Described by: G. A. Quakenbush

Horizon and
Beltsville
Lab. No.

O1 4 inches to 1/2. Last year's leaves, mostly oak.
Not sampled

O2 1/2 inch to 0. Dark reddish brown (5YR 2/2) disintegrated organic matter weakly matted by roots.
Not sampled

Ap1 0 to 2 inches. Dark brown (10YR 3/3) loamy sand; single grained (very weak, fine to medium crumb); friable.
59277

Ap2 2 to 7 inches. Dark brown (10YR 4/2) unevenly darker and paler, loamy sand; single grained; loose; abrupt irregular boundary with narrow tonguing into the A2.

A2 7 to 16 inches. Yellowish brown (10YR 5/4) loamy fine sand; single grained; loose; friable; clear wavy boundary. 9 to 12 inches thick.
59278

B1 16 to 19 inches. Yellowish brown (10YR 5/4) in most of the mass, fine sandy loam; very weak subangular blocky structure; friable; clear wavy boundary. 2 to 5 inches thick.
59279

B2t 10 to 27 inches. Strong brown (7.5YR 4/6) fine sandy loam; very weak subangular blocky structure; slightly plastic, scattered small firm brittle masses; clear wavy boundary. 4 to 8 inches thick.
59280

B3t 27 to 37 inches. Strong brown (7.5YR 4/6) fine sandy loam; very weak subangular blocky structure; friable except for lumpy masses, approximating 20 percent of the whole, which are firm and brittle; gradual smooth boundary. 6 to 10 inches thick.
59281

IIC 37 inches plus. Yellowish brown (10YR 5/6) fine sand becoming paler with depth; single grained; loose.
59282

Notes: Colors refer to moist soil.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic
 SOIL Downer sandy loam SOIL Nos. S50NJ-8-7 LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 59195 - 59200

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1													3B2 Cm	3B1 Coarse fragments		
		Total				Sand					Silt					2A2 > 2 < 76 Pct.	2 - 19	19 - 76 Pct. of < 76mm
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)	(2-0.1)					
		Pct. of < 2 mm																
0-10	Ap	60.4	32.1	7.5	2.9	16.0	18.2	16.1	7.2	13.8	18.3	28.2	53.2	0.99	1			
10-16	A2	71.2	22.6	6.2	3.0	17.7	23.0	19.9	7.6	10.2	12.4	26.6	63.6	0.99	1			
16-23	Bl ₁	70.9	21.8	7.3	2.2	16.7	22.8	20.8	8.4	9.9	11.9	27.6	62.5	0.99	2			

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic
 Soil: Downer sandy loam
 Soil No.: 858NJ-8-7
 Location: Gloucester County, New Jersey. South of Williamstown; property owned by Melvin Sickler.
 Vegetation and land use: ~~Cultivated cropland, field corn after 20 years of irrigated vegetables, some~~

double and triple cropping.

Drainage: Well drained.
 Permeability: Estimated moderately rapid.
 Parent material: Coastal plain sandy sediments.
 Described by: M. Markley

Horizon and
 Beltsville
 Lab. No.

Ap 59195	0 to 10 inches. Very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; very friable, nonsticky; pH 6.4; abrupt smooth boundary. 9 to 12 inches thick.
A2 59196	10 to 16 inches. Yellowish brown (10YR 5/6) sandy loam; weak medium granular structure; very friable, nonsticky; pH 6.0; gradual smooth boundary. 5 to 6 inches thick.
B1t 59197	16 to 23 inches. Dark brown (10YR 4/3) sandy loam; weak medium granular structure; very friable; in places peds are slightly firm, nonsticky; few clay films; pH 6.2; gradual smooth boundary. 6 to 7 inches thick.
B2t 59198	23 to 30 inches. Dark yellowish brown (10YR 4/4) sandy loam with rare parts heavy sandy loam; weak medium subangular blocky structure; very friable, in places firm, slightly sticky; common clay films; pH 6.2; gradual wavy boundary. 5 to 8 inches thick.
IIC1 59199	30 to 48 inches. Dark yellowish brown (10YR 4/4) gravelly loamy sand; stratified; firm to loose strata; pH 5.8; gradual irregular boundary.
IIC2 59200	48 to 60 inches. Yellowish brown (10YR 5/6) medium and coarse sand with lenses and balls of finer texture; stratified, single grain; very friable to firm, nonsticky; pH 5.8.

Notes: Colors refer to moist soil. Roots throughout A and B horizons, only few in the C horizon (below 30 inches) and none observed below 48 inches.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic
SOIL Downer loamy sand

SOIL Nos. 859NJ-5-1

LOCATION Cape May County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60319 - 60324

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1			
		1B1b Total				Sand				Silt				2A2 > 2	2-19	19-76	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	0.02-0.002	Int. III (0.02-0.002)					Int. II (0.2-0.02)
Pct. of < 2 mm																	
0-8	Ap	74.2	22.4	3.4	1.9	10.8	16.6	39.2	5.7	15.7	6.7	42.4	68.5	1.00	tr.		
8-15	A2	87.5	7.5	5.0	12.3	12.1	18.3	39.4	5.4	-2.7	10.2	35.8	82.1	1.00	tr.		
15-21	A3	73.3	20.4	6.3	1.1	9.9	17.6	39.0	5.7	9.3	11.1	36.5	67.6	1.00	tr.		
21-30	B2t	63.3	22.4	14.3	1.1	9.1	16.6	31.6	4.9	10.1	12.3	31.3	58.4	1.00	tr.		
30-34	B3t	76.6	12.4	11.0	2.0	11.6	21.7	36.9	4.4	6.3	6.1	28.5	72.2	1.00	tr.		
34-37	IIC1	92.3	3.9	3.8	1.8	17.2	26.8	42.7	3.8	2.5	1.4	25.9	88.5	1.00	tr.		
37-48	Not sampled																
Depth (in.)	6A1a Organic carbon	6B2a Nitrogen	C/N	Carbonate as CaCO ₃	Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/											pH	
					Bulk density	Water retained at suction of								Available water	Field capacity	8C1c (1:1)	8C1a (1:1)
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar				
Pct.																	
0-8	0.55	0.075	7		1.56	21.8	19.9	18.9	17.3	15.8	3.4	3.0	2.8	0.14	11.6		6.1
8-15	0.26	0.036			1.60	18.3	14.0	12.6	10.9	9.6	3.0	2.8	2.1	0.14	11.0		6.0
15-21	0.14				1.58	17.6	11.9	9.7	9.1	8.1	4.4	3.1	2.3	0.14	11.1		6.0
21-30	0.15				1.48	19.2	15.8	15.3	14.2	13.3	7.8	6.1	5.3	0.11	12.9		5.5
30-34	0.08				1.52	19.6	11.3	10.3	9.1	7.7	5.3	4.7	4.3	0.08	9.8		4.8
34-37	0.04				1.55	15.0	7.8	5.3	4.4	3.5	2.0	1.6	1.6	0.06	5.4		4.7
Depth (in.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation			
	6N2d Ca	8O2b Mg	8P2a Na	8Q2a K	Sum		5A3a Sum cations	CEC Sum		Ext. iron	15-bar water	5C3 Sum cations		5C1 NH ₄ OAc			
															meq/100 g		
0-8	2.5	0.6	tr.	0.2	3.3	2.3	5.6				1.65		0.82				
8-15	1.3	0.4	tr.	0.2	1.9	1.4	3.3				0.66		0.42		59		
15-21	1.0	0.5	0.1	0.2	1.8	1.2	3.0				0.48		0.37		58		
21-30	2.3	0.9	0.1	0.2	3.5	3.0	6.5				0.45		0.37		60		
30-34	1.8	0.6	0.1	0.1	2.6	3.3	5.9				0.54		0.39		54		
34-37	0.7	0.3	tr.	tr.	1.0	1.2	2.2				0.58		0.42		45		
Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/					Methods refer- enced on methods code sheet.			
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Hydrau- lic conduct- ivity in/hr	Porosity 8/			Aggregate stabil- ity Pot.				
										Non- capil- lary Pot.	Capil- lary Pot.	Total Pot.			Plastic index Pot.		
7A2 X-ray											7A3						
0-8									0.8	7.2	31.6	38.8		85			
8-15									1.2	15.6	22.3	37.9		25			
15-21									0.9	22.0	16.3	38.3		19			
21-30									2.3	18.2	23.3	41.5		14			
30-34									2.4	20.2	17.3	37.5		19			
34-37									8.7	24.9	11.7	36.6	N.P.	20			

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic

Soil: Downer loamy sand^{1/}

Soil No.: S59NJ-5-1

Location: Cape May County, New Jersey. Approximately 600 feet west of Bay Shore Road intersection with road to Higbee's Landing, about 40 feet west of east boundary of farm, on rise of land north of road, on Taylor farm.

Vegetation and land use: Cropped.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Developed in quaternary coastal plain sediments.

Described by: V. R. Powley and G. A. Quakenbush

Horizon and

Beltsville

Lab. No.

Ap 60319	0 to 8 inches. Dark grayish brown (10YR 4/2) loamy sand; single grain; very friable; abrupt smooth boundary. 8 to 9 inches thick.
A2 60320	8 to 15 inches. Yellowish brown (10YR 5/4) loamy sand, light yellowish brown (10YR 6/4) dry; single grain but weakly coherent; friable except firm in place in upper 4 inches; contains many channels of dark grayish brown Ap material; clear smooth boundary. 7 to 8 inches thick.
A3 60321	15 to 21 inches. Yellowish brown (10YR 5/6) fine sandy loam, faint variegations of strong brown (7.5YR 5/6); weak fine granular structure; friable except for minor, slightly firm parts; clear smooth boundary. 4 to 6 inches thick.
B2t 60322	21 to 30 inches. Strong brown (7.5YR 5/6) fine sandy loam, brown (7.5YR 5/4) dry; massive; friable, scattered small parts slightly firm, and slightly brittle, slightly sticky; contains few pockets up to 1 inch in diameter of light yellowish brown (10YR 6/4) loamy sand; clear smooth boundary. 8 to 11 inches thick.
B3t 60323	30 to 34 inches. Strong brown (7.5YR 5/6) fine sandy loam; massive; friable; 30 to 50 percent slightly firm in place and slightly brittle; containing few rounded quartz pebbles less than 1 inch in diameter; clear smooth boundary. 2 to 3 inches thick.
IIC1 60324	34 to 37 inches. Strong brown (7.5YR 5/8) sand, yellow (10YR 7/6) dry; single grain; very friable or loose; containing few rounded quartz pebbles less than 1 inch in diameter; clear smooth boundary. 3 to 5 inches thick.
IIC2	37 to 48 inches. Yellow (10YR 7/8) quartziferous sand with a few dark grains; single grain; loose; below 4 feet, color becomes light gray (2.5Y 7/2).

Notes: Colors refer to moist soils.

^{1/} Base saturation is raised by protracted use of agricultural fertilizers and liming. Base saturation at 71 inches is presumed to be below 35 percent.

FEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic
SOIL Downer sandy loam SOIL Nos. 899NJ-6-1 LOCATION Cumberland County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60325 - 60329

Depth (in.)	Horizon	181b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments		
		Total												2A2 > 2 < 76 Pct.	2-19 Pct. of < 76mm	19-76
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Silt Int. III (0.02- 0.002)	Int. II (0.2-0.02)				
0-6	Apl	Not sampled											0.99			
6-11	A2	72.7	20.8	6.5	5.8	28.0	22.8	13.3	2.8	7.6	13.2	15.2	69.9	0.98	2	
11-17	A2	68.0	23.1	8.9	5.0	24.2	20.7	14.5	3.6	8.4	14.7	17.7	64.4	0.98	3	
17-31	B2t	68.1	23.1	8.8	4.4	24.0	21.2	14.9	3.6	8.9	14.2	18.7	64.5	0.98	4	
31-37	B3t	73.2	15.7	11.1	5.2	18.4	21.7	21.5	6.4	7.2	8.5	22.9	66.8	0.88	18	
37-46	IIC1	81.6	12.6	5.8	8.6	17.8	19.8	26.4	9.0	8.1	4.5	29.5	72.6	0.72	37	
50-100	IIC2	Not sampled														

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/										pH				
						Water retained at suction of											Available water in/in	Field capa- city Pct.	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar							
0-6	Not sampled					1.70	16.4	13.0	11.4	10.1	8.9	6.3	4.1	2.9	0.144	11.4		5.7		
6-11	0.56	0.067	8		1.70	14.9	11.3	10.2	9.8	9.4	6.4	4.5	3.2	0.158	12.5		5.5			
11-17	0.28	0.045	6		1.54	15.7	11.5	10.2	9.5	8.9	6.2	4.3	3.9	0.121	11.8		5.0			
17-31	0.10				1.63	14.6	9.7	8.1	7.4	6.7	5.9	4.5	3.9	0.100	9.4		4.8			
31-37	0.08				1.75	12.0	7.6	6.4	6.0	5.5	3.1	2.5	2.1	0.106	7.6		4.8			
37-46	0.04																			
50-100	Not sampled																			

Depth (in.)	Extractable bases 5B1a					6N2a Ext. acidity	6N3a CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	8P2a Na	6Q2a K	Sum		SASa Sum cations	Ext. Al		CEC Sum	Ext. iron	15-bar water		Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g														
0-6	Not sampled					3.7	7.1			1.09	0.45		48		
6-11	2.6	0.4	0.1	0.3	3.4	2.7	4.8		0.54	0.36		44			
11-17	1.4	0.3	0.1	0.3	2.1	2.9	4.7		0.53	0.44		38			
17-31	1.1	0.3	0.1	0.3	1.8	3.7	5.9		0.53	0.35		37			
31-37	1.3	0.5	0.2	0.2	2.2	2.1	3.3		0.57	0.36		36			
37-46	0.7	0.3	0.1	0.1	1.2										
50-100	Not sampled														

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/					8/ Methods refer- enced on methods code sheet.
	Mt.	Chl.	Vm.	Ml.	Int.	Qtz.	Kl.	Gibbsite	Hydrau- lic conduc- tivity in/hr	Porosity 8/				
										Non- capil- lary Pot.	Capil- lary Pot.	Total Pot.	Plastic index Pot.	
0-6	Not sampled								1.0	11.1	22.1	33.2		51
6-11									1.1	13.2	19.3	32.5		45
11-17									1.5	18.8	17.3	36.1		33
17-31									0.9	16.6	15.3	31.9		39
31-37									1.2	13.9	13.2	27.1	N.P.	27
37-46														
50-100	Not sampled													

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic

Soil: Downer sandy loam

Soil No.: S99NJ-6-1

Location: Cumberland County, New Jersey. 2-1/2 miles west southwest of Fairton, on Dix Brothers farm, east side of north-south road, opposite Fred Dix's house, in field between farm buildings and house slightly to the south, about 75 feet north of east end of fenced in area in back of house.

Vegetation and land use: Cultivated.

Slope and land form: Nearly level, 0 to 1 percent.

Drainage: Moderate.

Permeability: Moderate.

Parent material: Developed in quaternary coastal plain sediments.

Described by: G. A. Quakenbush

Horizon and

Beltsville

Lab. No.

Apl 0 to 6 inches. Dark brown (10YR 4/3) sandy loam; massive; recently plowed, somewhat firm
Not sampled clods breaking to friable. 6 to 8 inches thick.

Ap2 6 to 11 inches. Dark brown (10YR 4/3), sandy loam; massive; firm and slightly brittle in
60325 place, friable when removed; abrupt smooth boundary but with narrow stringers extending
1 to 4 inches into the A2. Total Ap is 11 to 13 inches thick.

A2 11 to 17 inches. Dark brown (10YR 4/3) sandy loam, pale brown (10YR 6/3) dry; massive; firm
60326 and slightly brittle in place, friable when removed; worm tubes filled with Ap material;
clear wavy boundary. 5 to 10 inches thick.

B2t 17 to 31 inches. Strong brown (7.5YR 5/6) sandy loam, reddish yellow (7.5YR 6/6) dry;
60327 massive; friable; sand grains are covered in part with silt and clay material, clay films
very rare; clear wavy boundary. 9 to 14 inches thick.

B3t 31 to 37 inches. Strong brown (7.5YR 5/8) sandy loam; massive; very friable to slightly firm
60328 and slightly brittle; clear smooth boundary. 5 to 7 inches thick.

IIC1 37 to 46 inches. Strong brown (7.5YR 5/6) gravelly loamy sand; single grain; loose with
60329 small bodies firm and brittle where sand and gravel are bound by clay bridges; 25 percent
rounded quartzitic pebbles. 8 to 10 inches thick.

IIC2 50 to 100 inches. Stratified pale brown (10YR 6/3) coarse sand, light gray (10YR 7/2) dry;
Not sampled single grain; loose; 15 percent pebbles, mostly fine sand.

Notes: Colors refer to moist soil unless indicated otherwise.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic

SOIL Sassafras taxadjunct SOIL Nos. B58N1-6-1 LOCATION Cumberland County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59289 - 59294

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1													3B2 Cm	Coarse fragments 3B1			
		181b Total				Sand				Silt						3B2	2A2 ≥ 2 < 76 Pct.	2-19 Pct. of < 76mm	19-76 Pct. of < 76mm
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)	(2-0.1)						
0-3	A1	67.5	26.3	6.2	1.6	11.5	22.2	26.4	5.8	11.9	14.4	28.9	61.7	1.00	tr.				
3-12	A2	65.8	27.2	7.0	1.5	10.7	20.7	26.7	6.2	11.9	15.3	29.8	59.6	1.00	tr.				
12-23	B1	62.0	28.6	9.4	1.2	10.0	20.1	24.9	5.8	12.3	16.3	29.0	56.2	1.00	tr.				
23-33	B2t	56.3	27.2	16.5	0.9	7.6	17.0	24.9	5.9	12.4	14.8	30.0	50.4	1.00	tr.				
33-37	B3	73.1	17.8	9.1	1.2	10.2	24.4	31.3	6.0	9.3	8.5	29.1	67.1	1.00	tr.				
37-48	TIC	95.6	1.4	3.0	5.1	27.4	46.1	16.6	0.4	1.3	0.1	4.8	95.2	0.92	13				
Analyses by New Jersey Agr. Exp. Sta., Rutgers University																			
Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Bulk density g/cc	Water retained at suction of										Avail- able water in/in	Field capa- city Pct.	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar	8C1c (1:1) KCl	8C1a (1:1) H ₂ O				
0-3	1.37	0.089	15	0.6	1.19	33.6	30.5	17.4	16.5	14.6	6.5	5.0	4.0	0.20	21.2		4.0		
3-12	0.52	0.047	11	0.6	1.36	28.8	21.4	16.7	14.8	12.9	6.0	4.0	3.0	0.17	15.2		4.5		
12-23	0.16			0.8	1.48	24.8	18.7	15.2	12.3	10.6	6.6	4.4	3.3	0.15	13.4		4.4		
23-33	0.17			1.5	1.48	24.5	19.1	16.4	14.9	13.4	8.8	7.1	6.2	0.14	15.4		4.5		
33-37	0.08			1.0	1.54	21.9	15.4	12.3	10.2	9.2	5.3	4.4	3.7	0.15	13.2		4.6		
37-48	0.02			0.4	1.53	15.1	4.1	3.0	2.2	1.6	1.4	1.2	1.1	0.13	9.4		4.6		
Extractable bases 5B1a																			
Depth (in.)	6N2d Ca Mg Na K Sum meq/100 g					6H2e Ext. acidity	6G2e CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation					
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		6A3e Sum cations			CEC Sum	Ext. iron	15-bar water		8C3 Sum cations Pct.	8C1 NH ₄ OAc Pct.				
0-3	0.3	0.1	tr.	0.1	0.5	9.0	9.5		1.53	0.10	0.65		5						
3-12	0.1	tr.	tr.	0.1	0.2	4.8	5.0		0.71	0.09	0.43		4						
12-23	0.1	tr.	tr.	0.1	0.2	4.1	4.3		0.46	0.09	0.35		5						
23-33	0.1	0.8	tr.	0.1	1.0	3.1	4.1		0.25	0.09	0.38		24						
33-37	0.1	0.7	tr.	0.1	0.9	3.9	4.8		0.53	0.11	0.41		19						
37-48	0.1	0.4	tr.	tr.	0.5	1.0	1.5		0.50	0.13	0.37		33						
Clay Fraction Analysis 7A1b-d																			
Depth (in.)	Mt.	Chi	Vm	M.	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers				Aggre- gate stabil- ity Pct.	Methods refer- enced on methods code sheet.					
									Hydrau- lic conduc- tivity in/hr	Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.			Plastic index Pct.				
0-3									6.4	15.0	37.9	52.9	90						
3-12									2.7	16.4	29.1	45.5	91						
12-23									1.2	14.3	27.7	42.0	64						
23-33									1.1	13.5	27.6	41.1	40						
33-37									1.3	14.5	23.9	38.4	24						
37-48									28.6	27.3	6.3	33.6	N.P.						

Soil No.: S58NJ-6-1

Location: Cumberland County, New Jersey. 1/2 mile north of Jericho, intersection of Cook Lane and road going south toward Jericho, west side of road to Jericho about 100 feet in woods and 200 feet from field opposite the intersection.

Vegetation and land use: Woodland of hardwoods, chiefly black and white oak with some hickory and dogwood.

Drainage: Well drained.

Permeability: Moderately rapid.

Parent material: Quaternary coastal plain sediments.

Described by: G. A. Quakenbush

Horizon and
Beltsville
Lab. No.

O1	4 inches to 1/2.	Loose leaves from last year, mostly oak.
Not sampled		
O2	1/2 inch to 0.	Black (N 2/) fragmented partially decomposed leaves in a fibrous mat.
Not sampled		
A1	0 to 3 inches.	Dark brown (10YR 3/3) sandy loam, brown (10YR 5/3) dry; massive; friable; clear wavy boundary 2 to 3 inches thick.
59289		
A2	3 to 12 inches.	Yellowish brown (10YR 5/4) toward 7.5YR sandy loam, very pale brown (10YR 7/4) dry; massive; very friable; clear wavy boundary 10 to 16 inches thick.
59290		
E1	12 to 23 inches.	Dark brown (7.5YR 4/4 and 4/6) sandy loam, light yellowish brown (10YR 6/4) dry; massive; friable to slightly firm and brittle; clear wavy boundary. 4 to 12 inches thick.
59291		
B2t	23 to 33 inches.	Dark brown (7.5YR 4/4) fine sandy loam, yellowish brown (10YR 5/4) dry; massive; friable, slightly plastic; clear wavy boundary. 9 to 10 inches thick.
59292		
B3	33 to 37 inches.	Strong brown (7.5YR 4/6) fine sandy loam, light yellowish brown (10YR 6/4) dry; massive; very friable. 4 to 5 inches thick.
59293		
IIC	37 to 48 inches plus.	Brown (7.5YR 4/4) sand brownish yellow (10YR 6/6) dry; single grain; very friable to slightly firm and slightly brittle in place. A few clean quartz pebbles up to 1 inch in diameter.
59294		

Notes: Colors refer to moist soil unless indicated otherwise.

1/ This pedon is a taxadjunct because it is in the coarse-loamy family particle size class, whereas the Sassafras series is in the fine-loamy class. Clay content in the B2t horizon is 2.5 percent low.

PEDON CLASSIFICATION: Typic Hapludult; coarse-loamy, siliceous, mesic
SOIL Westphalia taxadjunct SOIL Nos. S59NJ-4-1 LOCATION Camden County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 60138 - 60142

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total				Sand				Silt				2A2 y 2 < 76 Pct.	2-19 Pct.	19-76 Pct. of < 76mm	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
0-4	A1	87.9	9.4	2.7	2.1	7.8	7.3	39.9	30.8	5.3	4.1	68.9	57.1	1.00	tr.		
4-17	A2	86.8	9.1	4.1	2.4	6.6	6.4	39.7	31.7	5.2	3.9	69.8	55.1	0.98	3		
17-23	B1t	79.7	10.5	9.8	1.6	3.6	3.4	37.6	33.5	5.4	5.1	72.3	46.2	0.95	9		
23-34	B2t	72.6	10.4	17.0	1.0	2.4	2.1	35.8	31.3	4.8	5.6	68.6	41.3	0.98	4		
34-60	C	76.2	11.6	12.2	-	0.2	0.3	26.2	49.5	6.2	5.4	80.3	26.7	1.00	tr.		

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	6C1a Ext. iron as Fe Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University A/										8C1a (1:1) H ₂ O	
						Bulk density g/cc	Water retained at suctions of								Avail- able water in/in		Field capa- city Pct.
							0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			
0-4	1.00	0.045	22		1.22	36.0	21.7	18.1	13.3	9.9	4.4	4.1	3.5	0.13	14.5	3.6	
4-17	0.40	0.031	13		1.34	32.7	23.0	19.1	11.4	7.0	4.6	3.5	2.5	0.13	12.2	4.3	
17-23	0.16				1.53	23.2	18.1	14.6	10.9	7.7	6.5	5.4	3.9	0.19	15.8	4.2	
23-34	0.12				1.57	20.2	17.6	16.6	15.3	13.6	10.1	9.0	7.7	0.16	17.3	4.2	
34-60	0.06				1.48	23.9	18.4	17.9	14.0	11.1	7.8	6.6	5.3	0.13	14.2	4.1	

Depth (in.)	Extractable bases 5B1a					6N2a Ext. acidity	CEC	6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation		
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum				5A3a Sum cations	CEC Sum	Ext. iron		15-bar water	5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	mg/100 g														
0-4	0.1	0.1	tr.	tr.	0.2	5.0	5.2							4	
4-17	tr.	tr.	tr.	tr.	tr.	3.9	3.9				0.95		0.61	-	
17-23	tr.	tr.	tr.	tr.	tr.	2.9	2.9				0.29		0.40	-	
23-34	tr.	tr.	tr.	tr.	tr.	5.0	5.1				0.30		0.45	-	
34-60	tr.	tr.	tr.	tr.	tr.	4.8	4.8				0.39		0.43	-	

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University A/					8/ Methods refer- enced on methods code sheet.
	Mt.	Chl.	Vm.	Ml.	Int.	Qtz.	Ml.	Gibbsite	Hydrau- lic conduc- tivity in/hr	Porosity 8/				
										Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.	Plastic index Pct.	
0-4									8.7	22.7	26.2	48.9		84
4-17									4.8	15.5	30.7	46.2		90
17-23									0.1	11.1	27.5	38.6		39
23-34									0.1	9.5	27.7	37.2		30
34-60									0.4	13.4	27.2	40.6		12

Pedon Classification: Typic Hapludult; coarse-loamy, siliceous, mesic

Soil: Westphalia taxadjunct 1/

Soil No.: S59NJ-4-1

Location: Camden County, New Jersey. 500 feet south of intersection of Blackwood-Clementon Road and Laurel Springs Road; Hidden Lake woodland, 50 feet from woodland edge; on photo CMV-23-76; Tettamer property.

Vegetation and land use: Hardwood forest, mostly oaks, some yellow poplar, scrub pine, beech, hickory. Shrubs of wild honeysuckle and laurel. Herbs, green briar, low bush blueberries. Chestnut stumps.

Slope and land form: 5 percent.

Drainage: Moderately well drained.

Permeability: Moderate.

Parent material: Kirkwood formation, fine sands.

Described by: Marco Markley

Horizon and
Beltsville
Lab. No.

O1 3 to 2 inches. Mostly oak leaves.

Not sampled

O2 2 inches to 0. Very dark gray (10YR 3/1) fibrous, matted broken leaves.

Not sampled

A1 0 to 4 inches. Gray (10YR 5/1) fine sand, browner in lowest inch; single grain; loose; abrupt wavy boundary. 2 to 5 inches thick including A1, A2 and B1r of incipient podzol.

60138

A2 4 to 17 inches. Light yellowish brown (2.5Y 6/4) loamy fine sand; weak medium subangular blocky structure; very friable; many roots; gradual smooth boundary. 12 to 16 inches thick.

60139

B1t 17 to 23 inches. Yellowish brown (10YR 5/6) very fine sandy loam; weak medium subangular blocky structure; friable; many roots; 5 percent rounded quartzose pebbles; abrupt smooth boundary. 3 to 6 inches thick.

60140

B2t 23 to 34 inches. Yellowish brown (10YR 5/8) very fine sandy loam; moderate medium subangular blocky structure; friable; common roots; gradual boundary. 10 to 14 inches thick.

60141

C 34 to 60 inches. Yellowish brown (10YR 5/8) very fine sandy loam; few medium prominent mottles of light brownish gray (10YR 6/2); weak medium subangular blocky structure; very friable; few roots; no coarse skeleton.

60142

Notes: Colors refer to moist soil.

1/This pedon is a taxadjunct because the argillic horizon is thick enough for the Typic subgroup, whereas the Westphalia series has a thin argillic horizon and is consequently in the Ochreptic subgroup.

PEDON CLASSIFICATION: Typic Hapludult; fine-loamy, mixed, mesic
SOIL Aura coarse sandy loam

SOIL Nos. 8581-8-2

LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59157 - 59160

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1													3B2 Cm	Coarse fragments 3B1		
		Sand											Silt 0.05-0.02	Clay (< 0.002)		2A2 > 2	2-19	19-76
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Vary coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)						
0-2	A1,A2,B	68.0	27.8	4.2	11.0	24.2	15.7	13.6	3.5	12.7	15.1	22.6	64.5	0.70	46			
2-9	A'2	62.7	27.3	10.0	13.0	21.4	13.5	9.7	5.1	11.3	16.0	21.6	57.6	0.77	36			
9-13	B'1t	59.7	24.5	15.8	11.6	20.9	13.0	8.8	5.4	10.3	14.2	20.4	54.3	0.84	23			
13-19	IIB'21t	58.2	20.1	21.7	15.6	20.7	10.9	6.5	4.5	7.7	12.4	15.4	53.7	0.81	28			

Depth (in.)	6A1a Organic carbon	6B2a Nitrogen	C/N	6C1a Ext. iron as Fe	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										pH		
					Bulk density g/cc	Water retained at suction of								Available water in/in	Field capacity Pct.	8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar				
0-2	2.36	0.060	39	0.2	1.34	29.0	22.3	20.3	15.6	14.0	7.2	5.3	3.6	0.26	22.2		3.6
2-9	0.52	0.049	11	0.7	1.42	24.3	18.5	17.2	14.4	12.8	6.7	5.5	4.4	0.18	16.1		4.4
9-13	0.28	0.036	8	1.0	1.64	17.3	14.1	13.1	11.4	9.6	8.4	5.3	3.5	0.16	13.3		4.3
13-19	0.28	0.018	16	1.4	1.56	20.1	16.8	15.4	13.8	12.4	16.9	14.8	13.9	0.09	16.0		4.2

Depth (in.)	Extractable bases 5B1e					6H2a Ext. acidity	6H2e CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3e Sum cations	Ext. Al		CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g														
0-2	0.1	0.1	tr.	0.1	0.3	7.8	8.1		1.93	0.05	0.86		4		
2-9	tr.	0.1	tr.	0.1	0.2	7.8	8.0		0.80	0.07	0.44		2		
9-13	0.1	tr.	tr.	0.1	0.2	4.5	4.9		0.31	0.06	0.22		4		
13-19	0.1	tr.	tr.	0.1	0.2	5.6	5.8		0.27	0.06	0.64		3		

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/					b/Methods referenced on methods code sheet.
	Mt.	Chl.	Vm.	Ml.	Int.	Qtz.	Kl.	Gibbsite	Porosity a/		Plastic index a/	Aggregate stability a/		
									Hydraulic conductivity a/	Non-capillary a/			Capillary a/	
0-2									7.7	14.7	30.0	44.7	95	
2-9									1.2	17.4	26.3	43.7	84	
9-13									0.7	15.6	22.2	37.8	73	
13-19									0.8	11.4	26.8	38.2	71	

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Aura coarse sandy loam^{1/}

Soil No.: S58NJ-8-2

Location: Gloucester County, New Jersey. Florence Getzov property; about 2,380 feet northeast of "y" intersection, at Bluebell, 250 feet north of the northeast road, about 50 feet back from the south-east edge of gravel pit.

Vegetation and land use: Oak forest chiefly white, black, northern red, chestnut. Suppressed species included sassafras, hickory, a few black gum, post oak, shortleaf pine, and scrub oak. Shrubs include blueberry and huckleberry.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Coastal plain medium to sandy textured sediments with brown sola.

Described by: M. Markley and G. Quakenbush

Horizon and

Beltsville

Lab. No.

O2	1/2 inch to 0.	Black (5YR 2/1) partially decomposed leaf fragments, laminated and full of root fibers, to 1 inch thick.
Not sampled		
A1 ^a	0 to 1/2 inch.	Very dark gray (10YR 3/1) sandy loam; massive; friable; rich in mycelia.
A2	1/2 to 1 inch.	Very dark grayish brown (10YR 3/2) sandy loam; massive; friable. Old root channel full of mycelia.
B	1 to 2 inches.	Dark brown (7.5YR 3/2) sandy loam or loam; massive; friable.
59157		
A'2	2 to 9 inches.	Yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; slightly sticky; 25 percent coarse skeleton of rounded quartz pebbles; roots abundant; clear wavy boundary. 6 to 9 inches thick.
59158		
B'1t	9 to 13 inches.	Dark yellowish brown (10YR 4/4) with inclusions of strong brown (7.5YR 5/6) gritty sandy loam; weak fine subangular blocky structure; slightly sticky; less than 5 percent coarse skeleton of rounded quartz pebbles; some clay coating; gradual wavy boundary. 4 to 6 inches thick.
59159		
IIB'21t	13 to 19 inches.	Yellowish red (5YR 5/6 to 4/6) gritty sandy clay loam or gritty sandy clay; massive; friable, sticky; all sand and gravel clay coated; mycelia common; abrupt smooth boundary. 6 to 12 inches thick.
59160		
IIB'22t	19 to 60 inches.	Yellowish red (5YR 4/6) gritty sandy clay loam; massive; firm to very firm in place, friable when removed, sticky; sand grains clay coated and bridged; about 5 percent coarse skeleton of fine sharp pebbles; some free water trickled from soil where it contained most pebbles; very few roots.

Notes: Colors are for moist soil.

^{1/}Although this pedon was not sampled below 19 inches, this combination of low base status above 19 inches and morphology below 19 inches is indicative of Ultisols in this sampling area.

PEDON CLASSIFICATION: Typic Hapludult; fine-loamy, mixed, mesic
SOIL Aura sandy loam SOIL Nos. 5561J-8-3

LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59161 - 59165

Depth (in.)	Horizon	181b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total				Sand				Silt				2A2 > 2 < 76 Pct.	2-19 Pct.	19-76 Pct. of < 76mm	
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)
0-4	A1, A2, B	58.8	33.9	7.3	5.6	16.6	15.1	14.6	6.9		19.0	29.0		17			
4-10	A'2	56.7	35.3	8.0	5.7	14.6	13.2	14.1	9.1		19.7	32.2		25			
10-15	B'1	52.8	37.0	10.2	3.9	13.1	12.6	14.0	9.2		21.0	32.8		20			
15-22	B'21t	45.8	33.4	15.9	4.9	12.8	11.5	12.4	9.1		19.0	30.2		36			
22-27	II B'22t	65.9	3.2	30.9	15.1	32.8	15.0	2.4	0.6		1.8	2.7		7			
Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/																	
Depth (in.)	6A1e Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Bulk density g/cc	Water retained at suction of								Available water in/in	Field capacity Pct.	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar			8C1c (1:1) KCl	8C1a (1:1) H2O
						Pct.										Pct.	
0-4	1.40	0.084	17	0.6	1.19	37.6	28.0	25.0	20.6	18.2	8.4	5.4	5.3	0.27	27.0		3.8
4-10	0.37	0.025	15	0.6	1.45	23.4	17.2	15.6	12.8	11.2	7.4	4.6	3.9	0.18	15.7		4.3
10-15	0.38	0.035	11	1.1	1.50	22.5	16.6	15.5	13.1	11.2	8.3	5.9	5.1	0.14	13.7		4.5
15-22	0.26	0.033	8	1.2	1.56	21.3	15.5	14.2	11.7	10.5	10.2	8.6	8.2	0.11	13.1		4.3
22-27	0.06	0.030		2.0	1.65	20.1	16.8	16.0	13.9	13.1	14.3	12.2	12.0	0.05	14.0		4.5
Extractable bases 5B1s																	
Depth (in.)	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation			
							5A3a Sum cations			CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH4OAc Pct.		
							meq/100 g					Pct.		Pct.		Pct.	
0-4	tr.	tr.	tr.	0.1		10.6	10.7			1.46				1			
4-10	0.1	tr.	tr.	0.1		4.5	4.7			0.59				4			
10-15	0.1	tr.	tr.	0.1		3.4	3.6			0.35				6			
15-22	0.1	tr.	tr.	0.1		5.8	6.1			0.38				5			
22-27	0.1	tr.	tr.	0.1		5.8	6.0			0.19				3			
Clay Fraction Analysis 7A1b-d																	
Depth (in.)	Mt.	Chl.	Vm.	Ml.	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/					Methods referenced on methods code sheet.			
									Hydraulic conductivity		Porosity		Plastic index		Aggregate stability		
									in/hr	Pct.	Pct.	Pct.				Pct.	
0-4									5.7	18.2	33.5	51.7	93				
4-10									0.7	19.0	25.0	44.0	70				
10-15									1.8	16.3	24.4	40.7	70				
15-22									1.3	15.0	24.0	39.0	61				
22-27									0.7	9.2	25.7	36.9	45				

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Aura sandy loam

Soil No.: S58NJ-8-3

Location: Gloucester County, New Jersey. 1-1/4 miles east of Fries Mill, along dirt road southeastward off of Williamstown-Fries Mill Road; in first woodlot south side of the dirt road, near slight curve; approximately 75 feet in the woods.

Vegetation and land use: Oak forest, chiefly white, northern red, black, chestnut, and hickory.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Coastal plain medium textured sediments with brown sola.

Described by: M. Markley, G. Quakenbush, and K. P. Wilson

Horizon and
Beltsville
Lab. No.

- O1 3 inches to 1. Undecomposed oak leaves over partially decayed broken leaves mixed with sand in the lower part.
- O2 1 inch to 0. Dark reddish brown (5YR 2/2) laminated, fibrous decayed leaves full of roots.
- A1, A2 0 to 1/2 inch. Horizons not clearly distinguishable; dark gray (5YR 4/1) sandy loam; massive; friable; abundant mycelia; abrupt smooth boundary. 9 to 3 inches thick.
- B
59161 1/2 to 4 inches. Dark grayish brown (10YR 4/2) sandy loam; massive; friable; many roots; 10 percent rounded quartz pebbles; abrupt irregular boundary. 0 to 4 inches thick.
- A'2
59162 4 to 10 inches. Yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; friable; 20 percent rounded quartz pebbles; clear wavy boundary. 6 to 10 inches thick.
- B'1
59163 10 to 15 inches. Dark yellowish brown (10YR 4/4) sandy loam; weak fine subangular blocky structure; friable; common roots; clay films on ped faces; 10 percent rounded quartz pebbles; clear smooth boundary. 3 to 6 inches thick.
- B'21t
59164 15 to 22 inches. Dark brown (7.5YR 4/4) gravelly loam; weak fine subangular blocky structure; friable, slightly sticky; roots common; common clay films; 10 percent rounded quartz pebbles; clear wavy boundary. 5 to 10 inches thick.
- B'22t 22 to 27 inches. Yellowish red (5YR 4/6) sandy clay loam; massive; firm in place, sticky; common clay films; clear wavy boundary. 4 to 8 inches thick.
- IIB'23t
59165 27 to 36 inches. Yellowish red (5YR 4/8) coarse sandy loam; massive; firm in place, friable when removed.

Notes: Colors refer to moist soil.

PEDON CLASSIFICATION: Typic Hapludult; fine-loamy, mixed, mesic
SOIL: Aura sandy loam SOIL Nos. 859WJ-8-5

LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59170 - 59173

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1				
		1B1b Total				Sand				Silt				2A2 > 2 < 76 Pct.	2-19 Pct.	19-76 Pct. of < 76mm		
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Int. III (0.02- 0.002)	Int. II (0.2-0.02)	(2-0.1)						
0-8	A _p	59.1	33.9	7.0	9.1	16.9	15.7	11.0	6.4	16.8	17.1	27.7	52.7	0.87	20			
8-13	A ₂	50.4	38.1	11.5	10.8	14.6	11.8	8.3	4.9	15.8	22.3	24.1	45.5	0.84	23			
13-17	B ₁	49.0	32.1	18.9	11.8	13.8	11.5	7.7	4.2	13.1	19.0	20.4	44.8	0.81	28			
17-72	IIB _t	66.6	4.7	28.7	19.0	23.8	16.5	6.2	1.1	2.2	2.5	5.3	65.5	0.80	28			
Pct. of < 2 mm																		
Depth (in.)	6A1a Organic carbon Pct	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										6D1 Available water in/in	Field capa- city Pct.	pH	
					Water retained at suction of												8C1c (1.1) KCl	8C1a (1.1) H ₂ O
					Bulk density g/cc	0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar	8C1b (1.1) KCl				
0-8	1.11	0.083	13	0.5	1.57	22.8	18.3	15.8	14.7	13.9	6.3	4.7	3.6	0.15	12.5		5.2	
8-13	0.24	0.029		0.7	1.75	16.8	14.9	12.8	11.1	9.8	8.1	5.1	4.0	0.15	11.9		5.8	
13-17	0.18			1.3	1.62	20.8	16.6	14.0	13.1	12.1	10.8	8.1	6.8	0.13	13.5		5.9	
17-72	0.08			1.7	1.70	15.4	14.0	12.4	11.5	10.9	11.3	10.1	9.8	0.07	12.0		4.4	
Depth (in.)	Extractable bases 5B1a					6H2e Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation				
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	CEC Sum		Ext. iron	15-bar water	5C3 Sum cations Pct.		5C1 NH ₄ OAc Pct.				
	meq/100 g																	
0-8	2.2	0.6	tr.	0.1	2.9	2.6	5.5		0.78	0.07	0.51		53					
8-13	0.8	0.2	tr.	0.1	1.1	1.1	2.2		0.19	0.06	0.35		50					
13-17	2.2	0.9	0.1	0.1	3.3	1.5	4.8		0.25	0.07	0.36		69					
17-72	1.2	0.5	tr.	0.1	1.8	5.2	7.0		0.24	0.06	0.34		26					

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Aura sandy loam

Soil No.: S58NJ-8-5

Location: Gloucester County, New Jersey. Southwest of Monroeville (lat. 39°36'50", long. 75°06'52");
Alex Clemick farm.

Vegetation and land use: In alfalfa for 8 years.

Slope and land form: 1 percent slope.

Permeability: Moderate.

Drainage: Well drained.

Parent material: Coastal plain medium textured sediments with brown sola.

Described by: M. Markley

Horizon and

Beltsville

Lab. No.

Ap 59170	0 to 8 inches. Dark grayish brown (2.5Y 4/2) sandy loam; weak fine granular structure; friable, nonsticky; 5 percent quartz pebbles; pH 6.6; abrupt smooth boundary. 8 to 9 inches thick.
A2 59171	8 to 13 inches. Light olive brown (2.5Y 5/4) loam; weak fine granular structure; friable, somewhat firm in place, nonsticky; 8 percent quartz pebbles; pH 6.6; clear smooth boundary. 4 to 8 inches thick.
B1 59172	13 to 17 inches. Dark yellowish brown (10YR 4/4) gravelly loam; weak medium subangular blocky structure; friable, sticky; pH 6.4; gradual smooth boundary. 2 to 5 inches thick.
IIBt 59173	17 to 72 inches. Dark brown (7.5YR 4/4) gravelly sandy clay loam; massive; firm in place, very sticky; 20 percent rounded pebbles less than 1 inch in diameter; roots common only in cracks; clay films nearly continuous on pebbles.

Notes: Colors refer to moist soil.

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Collington sandy loam

Soil No.: 86LNJ-13-1

Location: Monmouth County, New Jersey. Approximately 1-1/3 miles by road SE of Cream Ridge, along Smith Mill Road, east of road about 75 feet.

Vegetation and land use: Cultivated to potatoes; cropland.

Slope and land form: Broad, gently sloping (1 to 2 percent) upper part of slope divide between two areas that grade toward a larger drainage area; part of uneven coastal plain.

Erosion: Beginning within 50 feet down slope, soil loss by wind or water seems likely; plow layer only 6 to 8 inches rests directly on the most clayey part of B horizon.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Moderately glauconite-bearing sandy strata. (Stratification appears to persist even within the B horizon). Geologic map shows Red Bank-Tinton formations. Navesink marl is believed to occur at 11 or 12 feet. Wind action appears to have caused some sand accretion, giving thicker surface soil in some locations than at sample site.

Ground Water: Free water reached with bucket auger at about 10 feet. (October 19, 1961)

Described by: G. A. Quakenbush

Horizon and

Beltsville

Lab. No.

Ap 0 to 11 inches. Dark brown (7.5YR 3/2) sandy loam; weak fine granular structure in the upper part; massive in the lower several inches; friable in the upper part, firm in place but

friable when removed in the lower several inches, slightly sticky; scattered dark green grains of glauconite.

B1 11 to 13 inches. Dark brown (7.5YR 4/4) loam with streaks, mainly vertical, of dark brown (7.5YR 3/2) material occupying 30 to 40 percent of the mass (in worm borings); weak fine subangular blocky structure; friable, slightly sticky; some glauconite visible; clear smooth boundary.

B2t 13 to 29 inches. Dark brown (7.5YR 3/4) sandy clay loam; smearing under pressure to dark yellowish brown (10YR 3/4) with dark green grains showing; moderate, medium subangular blocky structure parting to weak fine subangular blocks; friable, slightly sticky; thin clay films common, clear and darker as well as redder than the rough scraped material; worm holes common and many filled with dark material from overlying horizons, especially in the upper half; glauconite grains common.

B3t 29 to 32 inches. Dark brown (7.5YR 3/4) sandy loam shaded by visible grains (10 percent) (7.5YR 5/4) and 30 to 40 percent very dark green; massive; friable, slightly sticky; glauconite estimated to constitute about 25 to 30 percent of the total soil; clear smooth boundary.

C1 32 to 44 inches. Dark brown (7.5YR 3/4) sandy loam sprinkled with visible grains (15 to 20 percent) brown (7.5YR 4/4) and 30 percent dark green; massive; very friable, nonsticky; estimated 25 to 30 percent glauconite.

C2 44 to 80 inches. Sandy loam with delicately variegated background colors of 50 percent dark brown to brown (7.5YR 4/4 and 3/4) some yellowish brown (10YR 5/6) and some yellowish red (5YR 4/6) speckled with 30 to 40 percent dark green grains; single grain; loose and non-sticky; estimated 25 to 30 percent glauconite.

C3 80 to 120 inches. Sandy loam; stratified glauconitic beds, banded 2.5Y and reddish hues; loose; some redder hues appearing like bands of iron oxides, related to impeded drainage above finer textured strata. The 2.5Y colors possibly from glaziation or inherited colors. Coarse sand with some gravel at about 9 feet.

Notes: Color readings are for moist soil (moisture content was high). Horizonation and thickness of horizons unusually uniform for coastal plain conditions. Starting with the lower part of the Ap and continuing throughout the B2, the soil was firm in place under pressures of fingers; also true of B3 and most of the C, but to slightly lower degree. The surface color is darkened by glauconite grains.

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Collington sandy loam

Soil No.: S61NJ-13-2

Location: Monmouth County, New Jersey. Holmdel, approximately 1,000 feet north of intersection of Holmdel-Hillsdale Road with New Jersey State Highway 6, along Route 6, 300 feet east of road.

Vegetation and land use: Alfalfa-grass mixture; cropland.

Slope and land form: Gently sloping (2 percent), upland, just below sandier cap on low knoll.

Drainage: Well drained.

Permeability: Moderate in the B2 horizon; in other horizons, rapid to very rapid.

Horizon and

Beltsville

Lab. No.

- Ap
62192 0 to 10 inches. Very dark gray (10YR 3/1) sandy loam; very weak, medium subangular blocky structure; very friable; scattered quartzose and concretionary fragments 1/2 to 2 inches in size. 10 to 11 inches thick.
- A2
62193 10 to 13 inches. Brown (10YR 5/3) and grayish brown (10YR 5/2) with common channels very dark grayish brown (10YR 3/2) loam; very weak, medium subangular blocky structure; slightly firm in place, friable; abundant root and worm tubes with dark colored material in them; scattered quartzose pebbles 1/2 to 2 inches in size; clear smooth boundary.
- B2t
62194 13 to 23 inches. Dark brown to brown (10YR 4/3) loam; moderate, medium subangular blocky structure; slightly firm; rootlets follow ped planes, many root holes commonly containing organic stained material; continuous clay films on peds, slightly darker than matrix; scattered quartzose and concretionary fragments one to two inches in size; clear smooth boundary.
- B3t
62195 23 to 29 inches. Dark brown (7.5YR 4/4) sandy loam finely speckled 50 percent with spots of dark olive; very weak medium subangular blocky structure; friable; some quartzose and

- C1
62196 29 to 36 inches. Dark brown to brown (10YR 4/3) sandy loam with specks of dark olive; single grained and, in parts, weak fine granular structure, very friable to loose; visible component of glauconite 20 to 30 percent; abrupt wavy boundary.
- C2
Not sampled 36 to 44 inches plus. Dark brown to brown (10YR 4/3) abundantly peppered with dark olive specks, gravelly sandy loam; single grained; very friable; quartzose gravel 1 inch to 4 inches in size.

Notes: Colors stated are for the moist soil. Roots: Some coarse roots found below 40 inches, in the C2 horizon; roots abundant through the A2 horizon to 13 inches; both fine and coarse roots pass through the B2 to 23 inches.

FEDON CLASSIFICATION: Typic Hapludult; fine-loamy, mixed, mesic
SOIL Freehold sandy loam SOIL Nos. S56NJ-3-2

LOCATION Burlington County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59243 - 59248

Depth (In.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2	Coarse fragments 3B1				
		Total					Sand					Int. II (0.2-0.02)		(2-0.1)	Cm	2-2	2-19	19-76
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02 (0.02-0.002)	Int. III (0.02-0.002)							
Pct. of < 2 mm																		
0-5	A1	66.2	26.0	7.8	0.5	3.0	10.4	35.2	17.1	12.4	13.6	49.3	49.1	1.00	tr.			
5-14	A2	68.4	23.4	8.2	0.2	2.6	10.4	36.5	18.7	11.0	12.4	50.6	49.7	1.00	-			
14-21	B1	67.7	21.8	10.5	0.5	2.9	10.5	35.6	18.2	10.0	11.8	48.7	49.5	1.00	-			
21-34	B2t	64.9	13.8	21.3	0.5	3.1	9.9	33.6	17.8	6.8	7.0	43.4	47.0	1.00	-			
34-41	B3t	74.8	9.5	15.7	0.3	2.5	10.4	40.6	21.0	5.0	4.5	50.0	53.8	1.00	-			
41-108	TIC	62.9	6.9	10.2	0.3	1.9	10.9	49.3	20.5	3.7	3.2	52.7	62.4	1.00	tr.			

Depth (In.)	6A1a Organic carbon	6B2a Nitrogen	C/N	6C1a Ext. Iron as Fe	Analyses by New Jersey Agr. Exp. Sta., Rutgers University &										pH				
					Bulk density	Water retained at suction of										Available water	Field capacity	8C1c (1:1)	8C1a (1:1)
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar	in/in	Pct.				
0-5	2.58	0.156	16	0.6	0.99	54.8	45.8	37.8	29.5	25.0	10.8	9.3	8.7	0.15	24.3		4.2		
5-14	0.30	0.031	10	0.6	1.39	31.0	20.2	16.7	13.4	12.0	7.3	4.6	3.7	0.16	25.5		4.3		
14-21	0.15			0.7	1.56	23.2	18.3	16.2	14.2	13.1	7.9	5.8	3.9	0.20	16.8		4.2		
21-34	0.13			1.3	1.61	22.5	20.2	18.2	16.2	15.2	11.8	10.0	8.3	0.18	19.2		4.3		
34-41	0.04			0.9	1.62	22.3	18.2	15.2	13.3	12.0	8.8	7.2	6.1	0.18	17.2		4.4		
41-108	0.04			1.0	1.52	26.2	16.8	11.3	9.6	7.6	5.5	4.9	4.1	0.14	13.1		4.5		

Depth (In.)	Extractable bases 5B1a					6M2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	Ext. Al		CEC Surf	Ext. Iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g														
0-5	0.6	0.4	0.1	0.2	1.3	15.9	17.2				2.20	0.08	1.12		8
5-14	0.1	0.2	tr.	0.1	0.4	6.8	7.2				0.88	0.07	0.45		6
14-21	0.1	0.2	0.1	0.1	0.5	6.6	3.1				0.29	0.07	0.37		16
21-34	0.4	1.0	0.1	0.2	1.7	11.2	12.0				0.56	0.06	0.39		7
34-41	tr.	1.1	0.1	0.2	1.4	8.2	9.6				0.61	0.06	0.39		14
41-108	0.3	1.1	tr.	0.1	1.5	6.5	8.0				0.78	0.10	0.40		19

Depth (In.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers University &					Methods referenced on methods code sheet.
	Mt.	Chl.	Vm.	Ml.	Int.	Qtz.	Kl.	Gibbsite	Porosity 8/					
									Hydraulic conductivity	Non-capillary	Capillary	Total	Plastic index	
0-5								5.1	14.2	44.9	59.1		90	
5-14								1.4	16.9	28.1	45.0		59	
14-21								0.4	9.2	28.4	37.6		21	
21-34								0.1	4.5	32.4	36.9		15	
34-41								0.7	8.2	29.5	37.7		9	
41-108								3.2	16.2	25.2	41.4		12	

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic
 Soil: Freehold sandy loam
 Soil No.: S56NJ-3-2
 Location: Burlington County, New Jersey. 1-1/2 miles southwest of Lumberton. Woodlot of Joseph Adamski.
 Photo CMU-7-119.
 Vegetation and land use: Hardwood woodland, mostly red oak.
 Slope and land form: 0 to 3 percent.
 Erosion: There has been little if any erosion on this site.
 Drainage: Well drained. No evidence of mottling to depth investigated.
 Permeability: Moderate.
 Sampled by and date: N. A. Willits and M. Markley. December 27, 1956.

Horizon and
 Beltsville
 Lab. No.

O1 3 inches to 1/2. Mostly loose oak leaves over entire area except where removed in vicinity
 Not sampled of ground hog holes. Broken stems, leaves, etc., partially decayed and matted.

O2 1/2 inch to 0. Black fluffy decayed leaves, in places slightly grayish. Insect casts and
 Not sampled tunnels of insects and small animals are abundant. A few earthworm casts are present.

A1 0 to 5 inches. Dark grayish brown to dark brown (10YR 4/2 to 4/3) sandy loam, weak fine
 59243 granular structure; very friable; some tongues extend several inches below normal horizon;
 gradual irregular boundary. 3 to 6 inches thick.

A2 5 to 14 inches. Yellowish brown (10YR 5/4 to 5/6) sandy loam; structureless; very friable;
 59244 glauconite grains apparent to naked eye, but not abundant; mica also present; clear wavy
 boundary. 8 to 11 inches thick.

B1 14 to 21 inches. Yellowish brown (10YR 5/6) sandy loam. Weak medium subangular blocky
 59245 structure; friable; glauconite and mica same as horizon above; clear wavy boundary.
 4 to 6 inches thick.

B2t 21 to 34 inches. Dark yellowish brown to dark brown (10YR 4/4 to 4/6 to 7.5YR 4/4) sandy
 59246 clay loam; moderate medium subangular blocky structure; friable, slightly sticky; glauconite
 and mica same as A2; abrupt smooth boundary. 12 to 14 inches thick.

B3t 34 to 41 inches. Colors mixed, yellowish brown (10YR 5/4) with greenish cast from
 59247 glauconite, sandy loam; massive; very friable; glauconite same as A2; abrupt smooth
 boundary. 7 to 8 inches thick.

IIC 41 to 108 inches. Extremely variable, yellowish red (5YR 5/8) iron concretions, to olive
 59248 yellow (2.5Y 6/8) loamy sand with thin 4 inch bands of sandy loam; single grain; loose;
 glauconite usually less abundant than above but varies considerable with strata; mica very
 abundant.

Notes: Colors are for moist soil.

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic.

Soil: Freehold sandy loam

Soil No.: S57NJ-13-1

Location: Monmouth County, New Jersey. Mrs. Charles Conover woodlot. Vanderburg-Marlboro Road, 500 feet west of Vanderburg, New Jersey. 200 feet south of above road along a dirt road. 75 feet east into woodlot.

Vegetation and land use: Old woodlot. Beach, red oak, scattered white oak, small hickory, occasional black birch, Kalmia and little else in understory.

Slope and land form: 2 to 3 percent. Drainage: Well drained. Permeability: Moderate.

Parent material: Glauconitic sandy loam.

Sampled by and date: K. P. Wilson and N. A. Willits. April 18, 1957.

Horizon and
Beltsville
Lab. No.

- O1 2 inches to 1. Loose leaves mainly beech and oak from last leaf fall; partially decayed, not tied down by mycelia. 2 to 3 inches thick.
Not sampled
- O21 1 to 1/2 inch. Brownish, decayed easily crumbled leaves, matted with roots and mycelia. 1/2 to 1 inch thick.
Not sampled
- O22 1/2 inch to 0. Black (10YR 2/1) silty organic material, dark reddish brown, (5YR 2/2) dry; slightly greasy when wet; matted with fine roots; discontinuous; pH 3.8. 0 to 1/2 inch thick.
Not sampled
- A1 0 to 1/2 inch. Very dark grayish brown (10YR 3/2) organic-rich sandy loam, dark reddish brown (5YR 2/2) dry; many fine organic grains and some faunal casts, finely dusted with clean silt; abundant fine roots. 0 to 1/2 inch thick.
Not sampled
- Bh 1/2 to 1 inch. Dark brown (7.5YR 3/2) sandy loam, brown (7.5YR 4/2 to 10YR 4/3) dry; weak fine to medium crumb structure; many fine pores; slightly firm in place; aggregates are dusted with clean silt; crushed aggregates have 20 to 30 percent clean quartz grains; smooth glauconite grains; pH 4.2; abrupt wavy boundary. 0 to 1/2 inch thick.
Not sampled
- A'21 1 to 8 inches. Yellowish brown (10YR 5/4) sandy loam, light yellowish brown (10YR 6/4) dry; weak medium subangular blocky structure; friable; many fine roots; many mycelia; few 1 mm pores, many finer; quartz grains and many fine aggregates dusted with silt; few glauconite grains; some brown organic material; pH 4.2; gradual wavy boundary. 6 to 10 inches thick.
59249
- A'22 8 to 13 inches. Yellowish brown (10YR 5/4) sandy loam, light yellowish brown (10YR 6/4) dry; weak, medium subangular blocky structure breaking to weak fine granules; loose to friable; many fine roots; sand grains faintly bridged with clay, heavily dusted with quartz silt; pH 4.8; gradual wavy boundary. 0 to 4 inches thick.
59250
- A'3 13 to 16 inches. Dark yellowish brown (10YR 4/4) sandy loam, light yellowish brown (10YR 6/4) dry; blocky structure, breaking to weak fine granules; slightly firm in place, friable when removed; many fine roots; many pores; few faint to distinct clay films on some peds; sand coated with silt and light covering of yellow clay; more glauconite than in horizon above, some round, smooth, green glauconite; few red siltstone grains; pH 4.6; gradual wavy boundary. 1 to 4 inches thick.
59251
- B'21t 16 to 23 inches. Dark brown (7.5YR 4/4) sandy loam, yellowish brown (10YR 5/6) dry; weak or moderate fine subangular blocky structure with abundant fine pores; firmer than A3; clay bridges sand grains; many 20 percent; tiny aggregates of silt and clay; many smooth green glauconite grains; many fine roots; pH 4.4; gradual wavy boundary. 4 to 7 inches thick.
59252
- B'22t 23 to 28 inches. Dark yellowish brown (10YR 4/4) sandy clay loam, to yellowish brown (10YR 5/4) dry; weak fine subangular blocky structure, breaking to weak fine granules; moderately firm in place; few coarse roots; all peds clay coated; ped interiors filled and bridged with clay; sand grains coated with thin, yellow clay films and dusted with silt grains; about 5 percent smooth soft rounded glauconite grains; pH 4.4; gradual wavy boundary. 5 to 8 inches thick.
59253
- B'3t 28 to 38 inches. Dark brown (10YR 4/3) heavy sandy loam matrix with finer channel fillings, yellowish brown (10YR 5/4) dry; massive; firm in place, friable when removed; many fine roots and root channels; discontinuous clay films on ped faces; (up to 20 percent); most sand grains coated and dusted with silt and many thinly coated by yellow clay; green splotches high in glauconite; few fine mica grains; pH 4.6; gradual wavy boundary. 6 to 10 inches thick.
59254
- IIC1 38 to 44 inches. Yellowish brown (10YR 5/6) sandy loam; dry; massive with many tiny, weakly aggregated clusters of grains; very friable; many pores; many clear quartz grains with discontinuous coatings; some clay bridges; 10 percent glauconite as medium sand; 2 percent mica; 5 to 8 inches thick.
59255
- IIC2 44 to 50 inches. Dark yellowish brown (10YR 4/4) loamy sand; dry; massive; many clay films as bridges and coats on medium sand; many fine pores; about 10 to 15 percent glauconite; some mica; many fine red grains.
59256

Notes: Colors refer to moist soil unless indicated otherwise. pH by colorimetric field test.

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Freehold sandy loam

Soil No.: S59NJ-13-5

Location: Monmouth County, New Jersey. One mile north of Colts Neck in permanent pasture at south end of Stanley Schank farm, 50 feet in from woods and black top road.

Vegetation and land use: Permanent pasture, principally bluegrass and white dutch clover.

Slope and land form: 1 percent.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Developed on reworked sands and silts deposited as a terrace on the underlying slightly dirty red sands of what is interpreted to be the Red Bank formation of Cretaceous age.

Sampled by: N. A. Willits and K. P. Wilson

Horizon and

Beltsville

Lab. No.

- Ap1
60163 0 to 4 inches. Very dark grayish brown (10YR 3/2) sandy loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; variable from friable to firm because of hoof punch marks; matted fine grass roots; abundant wormholes; pH 6.0; abrupt smooth boundary. 3 to 4 inches thick.
- Ap2
60164 4 to 10 inches. Dark brown (10YR 3/3) sandy loam, brown (10YR 5/3) dry; moderate medium subangular blocky structure parting to weak fine granular; slightly firm in place but friable when removed; abundant fine roots; many wormholes; coated granules well developed; some mixing of A2 throughout especially at bottom; pH 5.4; clear irregular boundary. 6 to 7 inches thick.
- A2
60165 10 to 16 inches. Strong brown (7.5YR 5/6) sandy loam, yellowish brown (10YR 5/4) dry; weak coarse platy and weak medium subangular blocky structure parting to very weak fine granular; slightly firm in place friable when removed; many fine roots; abundant root and worm channels with filling of Ap; pH 5.3; clear smooth boundary. 5 to 6 inches thick.
- B2t
60166 16 to 27 inches. Strong brown (7.5YR 5/6) loam, reddish yellow (7.5YR 6/6) dry; moderate, medium subangular blocky structure parting to moderate fine granular; firm in place, friable when removed; slightly plastic; several coarse roots and a few fine roots; worm and root channels common; clay films on ped faces; noticeable glauconite; pH 5.2; clear smooth boundary. 11 to 13 inches thick.
- B22t
60167 27 to 33 inches. Strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 5/8) dry; weak coarse subangular blocky structure parting to weak very fine granular; slightly less firm in place than horizon above; slightly plastic; few coarse roots; some discontinuous

clay films on peds; noticeable glauconite; pH 5.2; clear smooth boundary. 5 to 7 inches thick.

60168 blocky structure; slightly firm in place, very friable when removed; few roots; slight grain coating; noticeable glauconite; pH 5.2; clear smooth boundary. 5 to 8 inches thick.

IIIC2
60169 39 to 72 inches. Strong brown (7.5YR 5/8) sand, light and dark grains intermixed, yellowish brown (10YR 5/8) dry; single grained; weakly stratified parallel to surface; very loose; noticeable glauconite; pH 5.1; clear smooth boundary.

PEDON CLASSIFICATION: Typic Hapludult; fine-loamy, mixed, mesic

SOIL Matapeake taxadjunct

SOIL Nos. S57NJ-11-1

LOCATION Mercer County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 57447 - 57453

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1			
		Total												2A2 ≥ 2 < 76 Pct.	2-19 Pct.	19-76 Pct.	
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)					(2-0.1)
Pct. of < 2 mm																	
0-3	A1	31.9	57.7	10.4	1.5	7.5	7.6	9.0	6.3	26.9	30.8	37.5	25.6	1.00	tr.		
3-13	A2	33.5	55.0	11.5	1.6	8.3	8.4	9.4	5.8	24.0	31.0	34.4	27.7	0.99	2		
13-16	B1	27.3	60.0	12.7	1.2	6.1	6.7	7.7	5.6	25.8	34.2	34.9	21.7	0.99	1		
16-20	B21t	20.9	59.7	19.4	1.0	4.3	4.7	5.8	5.1	25.6	34.1	33.6	15.8	0.99	1		
20-25	B22t	17.2	59.6	23.2	0.5	2.7	3.8	4.9	5.3	26.6	33.0	34.4	11.9	0.99	2		
25-29	B3t	38.2	45.6	16.2	2.7	7.3	8.9	12.1	7.2	22.4	23.2	35.4	31.0	0.93	10		
29-40	IIC	79.3	9.1	11.6	6.1	16.1	16.7	29.9	10.5	5.7	3.4	32.5	68.8	0.89	16		

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Analyses by New Jersey Agr. Exp. Sta., Rutgers University a/										pH		
					Bulk density g/cc	Water retained at suctions of								Avail- able water in/in	Field capa- city Pct.	8C1c (1-1) KCl	8C1e (1.1) H2O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar				
0-3	5.2	0.196	26	0.8	1.06	47.7	37.5	35.9	32.7	29.4	15.2	10.9	9.3	0.23	31.1		3.7
3-13	0.94	0.049	19	0.8	1.27	35.5	25.9	25.1	22.6	19.3	11.6	6.9	5.2	0.23	23.2		4.3
13-16	0.28			0.8	1.40	30.2	23.2	22.6	20.6	19.0	12.0	7.2	5.3	0.23	21.8		4.6
16-20	0.26			1.1	1.45	27.6	24.5	23.7	22.5	20.9	15.2	9.8	7.6	0.21	21.9		4.5
20-25	0.24			1.3	1.51	26.2	23.5	22.7	21.9	21.1	16.5	11.9	9.9	0.12	17.5		4.3
25-29	0.20			1.8	1.84	16.1	14.8	14.4	14.0	13.2	10.3	7.9	6.6	0.16	14.8		4.3
29-40	0.11			0.8	1.80	15.6	12.9	12.2	11.5	10.7	8.9	6.2	4.9	0.17	13.5		4.5

Depth (in.)	Extractable bases 5B1a					6H2a Ext acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation			
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations			CEC Sum	Ext iron	15-bar water		5C3 Sum cations Pct.	5C1 NH4OAc Pct.		
	meq/100 g																
0-3	0.4	0.4	0.1	0.2	1.0	22.0	23.1						0.20	0.08	0.89	5	
3-13	tr.	0.1	0.1	0.2	0.4	9.3	9.7						0.84	0.07	0.45	4	
13-16	tr.	0.1	0.1	0.2	0.4	6.5	6.9						0.54	0.06	0.42	6	
16-20	tr.	tr.	0.1	0.2	0.3	9.1	9.4						0.48	0.06	0.39	3	
20-25	tr.	tr.	tr.	0.2	0.2	12.2	12.4						0.53	0.06	0.43	2	
25-29	tr.	0.5	tr.	0.1	0.6	8.3	8.9						0.55	0.11	0.41	7	
29-40	tr.	0.5	tr.	0.1	0.6	8.4	9.0						0.77	0.07	0.42	7	

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers a/					8A/Methods refer- enced on methods code sheet.
	Mt.	Chl.	Vm	Mi.	Int.	Qtz.	Kl.	Gibbsite	Hydrau- lic conduc- tivity in/hr	Porosity a/				
										Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.	Plastic index Pct.	
0-3									3.9	16.6	39.3	55.9		93
3-13		x	xxx	xx			10	tr.	0.9	14.8	32.8	47.6		-
13-16									0.5	13.1	32.4	45.5		65
16-20									0.4	9.3	35.4	44.7		57
20-25		x	xx	xx			15	2	0.3	7.3	35.4	42.7		-
25-29									0.3	5.3	26.8	32.1		29
29-40	x		x	xx			40	2	0.5	8.3	23.2	31.5		20

Mt. = Montmorillonite, Chl. = chlorite, Vm. = Vermiculite, mi = mica,
Int. = Interstratified layer, Qtz. = quartz, Kl. = Kaolinite

Relative amounts: blank = not determined, dash = not detected,
tr. = trace, x = small, xx = moderate, xxx = abundant, xxxx = dominant.

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Matapeake taxadjunct 1/

Soil No.: S57NJ-11-1

Location: ~~Metairie, New Jersey, Rowles woodlot, 1 1/2 miles west of Hightstown or Beltsville~~

Hightstown Road. 100 feet from east edge of woodlot and 50 feet in from north side of road.
 Vegetation and land use: White oak, red oak, hickory, dogwood. Considerable brush of viburnum, sassafras, soft maple.
 Slope and land form: 2 percent. Erosion: Little or no accelerated erosion.
 Drainage: Well drained. Permeability: Moderate.
 Parent material: Silty mantle overlying gravelly and sandy, cross bedded deposits.
 Sampled by and date: K. P. Wilson, G. A. Quakenbush, E. J. Pedersen, S. E. Davidson, and N. A. Willits.
 March 29, 1957.

Horizon and
 Beltsville
 Lab. No.

- O1 4 to 2 inches. Loose leaves, mainly oak, some maple.
 Not sampled
- O21 2 inches to 1/2. Decayed leaves from previous fall. Leaves grind up easily between fingers.
 Not sampled Leaves matted and tied together and to the underlying layer by mycelia and rootlets. Frequent holes of earth fauna.
- O22 1/2 inch to 0. Very dark brown (10YR 2/2) silty organic matter; weak fine granular structure;
 Not sampled porous but matted with fine and coarse roots; A1 and A2 somewhat mixed in by earth fauna; pH 3.9; abrupt broken boundary. 0 to 1 inch thick.
- A1 0 to 3 inches. Dark gray to very dark gray (10YR 4/1 to 3/1) silt loam; weak fine crumb

57447 structure; friable to loose; dark stained; dusted with fine particles of quartz; larger, rounded grains are frosted but uncoated; rare fine white mica; no dark minerals; scattered gravel and large stones 1 to 6 inches, quartzite, gneiss, (one gabbro); many fine and coarse roots; pH 3.7; clear broken boundary. 0 to 4 inches thick.

A2 3 to 13 inches. Brown (10YR 5/3) silt loam, yellowish brown (10YR 5/4) dry; weak fine crumb to
 57448 weak medium subangular blocky structure at bottom; friable; coarse and fine roots; many very fine common fine pores; common fine roots; organic stain throughout; scattered 1 to 6 inch quartzite gravel; mainly clean finely divided quartz particles; 1 percent dark, hard, glossy, rounded grains less than 0.05 mm; 2 percent 1/2- to 1-inch quartz pebbles; pH 4.3; gradual irregular boundary. 8 to 14 inches thick.

B1 13 to 16 inches. Yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure;
 57449 friable to firm; clay bridging and coating grains, clay films on peds discontinuous and with little color contrast to matrix; many dark grains; scattered very fine white mica, especially oriented on ped faces; 2 percent 1/2 to 1 inch quartz pebbles; coarse and fine roots common; pH 4.6; gradual wavy boundary. 3 to 7 inches thick.

Pedon Classification: Typic Hapludult; fine-loamy, mixed, mesic

Soil: Matapeake taxadjunct ^{1/}

Soil No.: S57NJ-12-3

Location: Middlesex County, New Jersey. John Wicoff woodlot, 1 mile east of Plainsboro. Woodlot 500 feet northeast along power line and 75 feet west of power line into woods.

Vegetation and land use: Beech, white oak, red oak, hickory, maple leaf viburnum, sassafras, and maple.

Slope and land form: 1 percent.

Drainage: Well drained.

Permeability: Moderate.

Parent material: Silty mantle overlying gravelly and sandy, cross bedded deposits.

Sampled by and date: K. P. Wilson, E. J. Pedersen, S. E. Davidson, G. A. Quakenbush, and N. A. Willits.

March 28, 1957

Horizon and
Beltsville
Lab. No.

- O1 4 to 2 inches. Loose leaves, undecayed, from last leaf fall; oak and beech leaves predominate;
Not sampled not tied to underlying layer.
- O21 2 inches to 1/2. Decayed leaves from previous fall; leaves can easily be ground up by fingers;
Not sampled leaves matted and tied together and to the underlying layer by mycelia and rootlets; 1 to 2 inches thick.
- O22 1/2 inch to 0. Black (10YR 2/1) silty decayed humus with some mineral matter; matted with
Not sampled very fine and medium sized roots; mixed somewhat by micro- and macroearth fauna with A1 and A2; pH 3.7; lower boundary distinct, discontinuous. 0 to 1/2 inch thick.
- A1 0 to 4 inches. Very dark grayish brown (10YR 3/2) silt loam; very weak fine granular structure;
57466 very friable; mixed organic particles, streaks and stains of mineral matter, mainly as rounded fine silica grains 0.01 mm, but some 0.1 mm or larger, large grains clean or coated by finer ones, scattered rounded black grains 0.1 mm opaque and dull; occasional fine white mica; many 0.5 to 0.1 mm pores; many fine roots; scattered 1/2 to 1 inch quartz pebbles; pH 3.9; clear irregular boundary. 1 to 5 inches thick.
- A2 4 to 11 inches. Yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure;
57467 friable; mainly finely divided clear quartz with some fine mica; small cracks coated and stained with organic matter; many 0.5 mm and smaller pores; many fine roots; few 1/2 to 1 inch quartz pebbles; pH 4.8; gradual wavy boundary. 3 to 8 inches thick.
- B1t 11 to 18 inches. Dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky
57468 structure; friable to firm, hard when dry; about 10 percent 1 mm, frosted quartz grains; few black carbon flakes; few fine white mica; cavities coated with clay but not much bridging; slightly redder discontinuous clay films on peds; many 0.05 to 1.0 mm pores; very fine root hairs penetrate peds; 10 percent 1/2 to 1 inch quartz gravel; pH 4.3; gradual wavy boundary. 4 to 7 inches thick.
- B2t 18 to 28 inches. Dark brown (7.5YR 4/4) heavy silt loam; very faintly mottled with slightly
57469 redder hue; weak medium subangular blocky structure; firm; mainly rounded quartz grains, 0.2 mm diameter; most grains coated with clay and silt; few white mica; clay films on peds continuous; few fine and coarse roots; few 1/2 to 1 inch quartz pebbles; pH 4.3; gradual irregular boundary. 4 to 12 inches thick.
- IIC1 28 to 38 inches. Strong brown (7.5YR 5/6) loam; massive; firm in place, friable when removed;
57470 12 percent 1/4 to 2 inch quartz and decayed chert fragments, rounded and angular; quartz pebbles coated with clay; films of clay on undersides of quartz pebbles and in cavities; upper sides of pebble coatings porous; sand grains commonly less than 1 mm diameter and are frosted and coated with clay; stained scattered fine white mica; a little organic stain in very localized spots; pH 4.7; gradual and wavy lower boundary. 6 to 15 inches thick.
- IIC2 38 to 50 inches. Yellowish brown (10YR 5/6) sandy loam; massive; firm to very firm in place,
57471 friable when removed; 15 percent 1/8 to 2 inches quartz and decayed chert gravel; dark grains 0.05 mm or finer, somewhat glossy, black, hard; few fine mica; grains coated with silt and clay; pH 4.8.

Notes: Colors are for moist soil.

^{1/} This pedon is a taxadjunct because its family particle size class is fine-loamy, whereas the Matapeake series is in a fine-silty class.

Pedon Classification: Typic Hapludult; fine-silty, mixed, mesic

Soil: Matapeake silt loam

Soil No.: S58NJ-12-1

Location: Middlesex County, New Jersey. One mile east of Dayton in cultivated field of Hunkele farm. 100 feet south of dead end road and 200 feet east of woodlot on medium sized flat area. Across road from Hunkele woodlot sampled for same soil in 1957.

Vegetation and land use: Plowed in fall. Previously in wheat. Rotation 2 years potatoes, 1 year wheat, 1 year clover. Never irrigated. This rotation used for last 10 to 15 years. Lost clover in last year's drought, hence plowed this year after wheat.

Slope and land form: 1 percent.

Erosion: Little erosion is believed to have occurred at site, even though A2 is generally missing or very thin below plowed layer.

Drainage: Well drained.

Permeability: Moderately permeable.

Parent material: Developed in silt mantle.

Sampled by and date: N. A. Willits, K. P. Wilson, M. A. Hawkins. April 3, 1958.

Horizon and

Beltsville

Lab. No.

- Ap
59257 0 to 10 inches. Dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure parting to very fine granules; friable but aggregates very firm when dry; scattered 1/2 to 1-1/2 inch quartz pebbles; pH 4.4; abrupt wavy boundary. 8 to 11 inches thick.
- A2, B1
59258 10 to 12 inches. Dark yellowish brown (10YR 4/4) fine silt loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure parting to very fine granules; peds very hard when dry; slightly firm in place; many fine roots; this horizon discontinuous because of deep plowing and penetration by worm or root holes filled with organic matter; pH 5.2. 0 to 2 inches thick.
- B21t
59259 12 to 21 inches. Dark brown (7.5YR 4/4) silty clay loam, with slightly redder ped coatings; light yellowish brown (10YR 6/4) dry; very weak medium prismatic structure parting to moderately firm in place but friable when removed; many very fine roots; wormholes and root holes filled with organic stained Ap material; all peds continuously coated with clay when observed under 20x lens; pH 5.2; gradual wavy boundary. 10 to 11 inches thick.
- B22t
59260 21 to 27 inches. Strong brown (7.5YR 5/6) silt loam with more clay but less silt than in A1 horizon, light yellowish brown (10YR 6/4) or slightly redder dry; moderate medium subangular blocky structure; moderately firm in place, friable when removed; very many fine roots; clay films on ped surfaces discontinuous; pH 4.5; clear wavy boundary. 5 to 6 inches thick.
- IIC1
59261 27 to 34 inches. Dark yellowish brown (10YR 4/4) gravelly loam, light yellowish brown (10YR 6/4) dry; moderate medium subangular blocky structure; firm to very firm in place, friable when removed; few fine roots; 30 percent 1/2 to 2 inch quartz pebbles; clay on both tops and bottoms of pebbles; pH 4.8. 8 to 9 inches thick.
- IIIC2
59262 34 to 40 inches. Reddish brown (5YR 4/4) gravelly sandy clay loam, strong brown (7.5YR 5/6) dry; massive to granular structure, masked by coarse skeleton; firm in place, friable when removed; 35 percent 1/2 to 2 inch diameter gravel mainly quartz with some quartzite and decayed chert; clay bridges and films on coarse sand grains; pH 4.8.

Notes: Colors refer to moist soil unless indicated otherwise.

PEDON CLASSIFICATION: Aquic Hapludult; coarse-loamy, siliceous, mesic
SOIL Hammonton sandy loam SOIL Nos. S61NJ-3-1 LOCATION Burlington County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 62203-62208

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1		
		181b Total				Sand				Silt				2A2 % 2 <76 Pct.	2-19	19-76
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (\leq 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)				
Pct. of \leq 2 mm																
0-9	Ap	74.7	19.1	6.2	4.3	21.1	14.6	19.8	14.9	11.1	8.0	36.6	59.8			
9-15	A2	76.3	17.9	5.8	5.9	21.0	14.0	20.3	15.1	9.3	8.6	35.6	61.2			
15-20	Blt	69.5	20.5	10.0	3.8	17.7	13.2	19.5	15.3	11.1	9.4	37.4	54.2			
20-24	B2lt	62.2	26.2	11.6	3.8	16.1	10.6	15.9	15.8	13.9	12.3	38.5	46.4			
24-33	B3gt	50.0	38.8	11.2	2.9	10.7	6.9	11.6	17.9	20.8	18.0	45.3	32.1			
33-40	IIc1	94.1	2.2	3.7	8.8	29.6	16.9	26.8	12.0	1.8	0.4	29.0	82.1			
40-60	IIIC2	Not sampled														

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Ext. iron as Fe Pct.	Bulk density			4D1 COLE	Water content			4C1 WRD In/in	pH	
						4A1e 1/2 bar g/cc	4A1h Oven dry g/cc	4B1 g/cc		4B1c 1/2 bar Pct.	4B2 15 bar Pct.	8C1c (1:1) KCl		8C1a (1:1) H ₂ O	
						0-9	0.86	0.058		15					
9-15	0.19														
15-20	0.14														
20-24	0.12														
24-33	0.10														
33-40	0.02														
40-60	Not sampled														

Depth (in.)	Extractable bases 5B1a					6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 6J1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum cations	Ext. Fe		CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g														
0-9	3.0	0.9	0.1	0.2	4.2	3.4	7.6						1.22		55
9-15	1.0	0.2	tr.	0.2	1.4	1.5	2.9						0.50		48
15-20	1.5	0.6	0.1	0.2	2.4	1.9	4.3						0.43		56
20-24	1.7	0.8	0.1	0.1	2.7	2.5	5.2						0.45		52
24-33	1.0	0.4	0.2	tr.	1.6	4.2	5.8						0.52		27
33-40	0.2	0.2	tr.	tr.	0.4	1.1	1.5						0.40		27
40-60	Not sampled														

Depth (in.)	Clay Fraction Analysis 7A1b-d							
	Mt.	Chi.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite
	7A2 X-ray				7A3			

Mt. = Montmorillonite, Chi. = chlorite, Vm. = Vermiculite, mi = mica,
Int. = Interstratified layer, Qtz. = quartz, Kl. = Kaolinite
Relative amounts: blank = not determined, dash = not detected,
tr. = trace, x = small, xx = moderate, xxx = abundant, xxxx = dominant.

Pedon Classification: Aquic Hapludult; coarse-loamy, siliceous, mesic
 Soil: Hammonton sandy loam

Soil No.: S61NJ-3-1

Location: Burlington County, New Jersey. Tabernacle, property of Anna Belle Haines, southeast of house,
 300 feet north of oak tree in farm lane, 120 feet east of lane.

Vegetation and land use: General crop rotation including barley and vegetables.

Slope and land form: Extensive flat area; elevation about 90 feet.

Drainage: Somewhat poorly drained.

Permeability: Moderately rapid.

Parent material: Moderately sandy coastal plain deposits.

Ground water: Water table at 60 inches. (July 25, 1961)

Described by: Marco Markley

Horizon and

Beltsville

Lab. No.

Ap 0 to 9 inches. Dark grayish brown (2.5Y 4/2) sandy loam, grayish brown when dry (2.5Y 5/2);
 62203 weak fine granular structure; very friable; roots numerous; worm channels common; very few
 rounded quartz pebbles; abrupt smooth boundary. 8 to 10 inches thick.

A2 9 to 15 inches. Light olive brown (2.5Y 5/4) loamy sand; few fine faint mottles; weak fine
 62204 granular structure; slightly firm in place, friable when removed; roots common; few 1/2 inch
 concretions; very few pebbles; gradual smooth boundary. 5 to 6 inches thick.

Blt 15 to 20 inches. Yellowish brown (10YR 5/4) sandy loam; few fine faint mottles; weak medium
 62205 granular structure; very friable; roots common; very few pebbles; gradual smooth boundary.

B22+ 20 to 24 inches. Slightly darker reddish brown (10YR 5/4)

FEDON CLASSIFICATION: Aquic Hapludult; fine-loamy, mixed, mesic
SOIL Mattapex taxadjunct SOIL Nos. S57NJ-12-2

LOCATION Middlesex County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 57459 - 57465

Depth (In)	Horizon	1B1b Size class and particle diameter (mm) 3A1													3B2 Cm	3B1 Coarse fragments		
		Total			Sand					Silt			Clay (= 0.002)	2A2 ≥ 2 < 76 Pct.		2-19	19-76	
		Sand (2-0.05)	Silt (0.05- 0.002)		Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Int. III (0.05-0.02 0.002)	Int. II (0.02-0.02)	(2-0.1)						
		Pct. of < 2 mm																
0-9	Ap	25.8	61.8	12.4	1.2	3.6	5.0	7.1	8.9	30.5	31.3	42.9	16.9	0.92	14			
9-12	A2	19.0	64.4	16.6	0.6	2.3	3.2	5.1	7.8	30.5	33.9	41.0	11.2	0.96	7			
12-19	B21t	17.8	58.2	24.0	0.2	1.8	2.7	4.9	8.2	29.2	29.0	40.1	9.6	0.99	2			
19-22	B22t	22.1	58.3	19.6	0.6	2.0	3.2	6.1	10.2	30.8	27.5	44.5	11.9		3			
22-28	B3	30.8	53.8	15.4	1.0	3.2	5.2	9.5	11.9	29.4	24.4	46.7	18.9	0.99	2			
28-34	TIC1	53.9	38.0	8.1	1.5	6.6	12.9	20.2	12.7	23.5	14.5	46.7	41.2	0.80	26			
34-44	TIC2	58.3	32.4	9.4	6.4	10.9	15.1	17.2	8.6	19.6	12.8	35.6	49.7		34			

Pedon Classification: Aquic Hapludult; fine-loamy, mixed, mesic

Soil: Mattapex taxadjunct 1/

Soil No.: S57NJ-12-2

Location: Middlesex County, New Jersey. Charles Holston field. 1 mile east of Dayton, field south of barn about 150 feet and about 40 feet from woods where S57NJ-12-1 taken. About 200 feet from east corner of woods.

Vegetation and land use: Cultivated field. Winter wheat cover crop. Has been planted to white potatoes continuously for 30 years. Grain crop 1949, only exception.

Slope and land form: 1 percent.

Erosion: Little or no erosion has taken place here.

Drainage: Moderately well drained.

Permeability: Moderate.

Parent material: Silty mantle overlying gravelly and sandy, cross bedded deposits (Pensauken formation, post-Jerseyan, pre-Wisconsin age).

Sampled by and date: K. P. Wilson, E. J. Pedersen, S. E. Davidson, and N. A. Willits. March 26, 1957.

Horizon and
Beltsville
Lab. No.

- Ap
57459 0 to 9 inches. Dark grayish brown to brown (10YR 4/2 to 4/3) silt loam; weak medium subangular blocky structure; firm; moderately permeable; many fine roots; scattered 1/2 to 1 inch quartz pebbles; pH 5.3; abrupt smooth boundary. 8 to 9 inches thick.
- A2
57460 9 to 12 inches. Yellowish brown (10YR 5/4) silt loam; weak medium or thick platy structure; plow pan breaks to weak medium subangular blocky; firm in place, friable when removed; worm-holes 1 to 4 inches apart and roots pass through this easily; no evidence of roots following flatness; little shrinkage and cracking; rounded frosted quartz grains of .02 mm size dusted with fine angular quartz silt and very fine sand; about 1 percent glossy, hard dark mineral; scattered fine white mica; 5 percent 1/4 to 1 inch diameter quartz pebbles; pH 5.3; clear wavy boundary. 1 to 4 inches thick.
- B2lt
57461 12 to 19 inches. Strong brown (7.5YR 5/6) heavy silt loam; moderate medium subangular blocky structure; firm; continuous clay films slightly redder than ped interiors. Clay and organic movement along root channels; many fine pores and more dense than A2; the 1 mm quartz grains are rounded and frosted; few fine white mica; many fine roots; 2 percent 1/2 to 1 inch quartz pebbles; clear wavy boundary; pH 5.2. 5 to 8 inches thick.
- B22t
57462 19 to 22 inches. Brown (7.5YR 5/4) heavy silt loam; moderate medium subangular blocky structure parting to fine subangular blocks; slightly brittle; firm in place, friable when removed; discontinuous clay films, clay flows along vertical fractures; common fine roots; pH 4.8; gradual irregular boundary. 2 to 6 inches thick.
- B3
57463 22 to 28 inches. Yellowish brown (10YR 5/6) silt loam with a few fine distinct low chroma mottles and strong brown spots (7.5YR 5/8); moderate medium subangular blocky structure; very firm in place, peds firm and denser than horizon above, slightly sticky; clay films on peds patchy; clay coats around pebbles, especially on undersides, clay bridges, especially in redder spots; 2 percent glossy, hard dark mineral grains scattered fine white mica

Pedon Classification: Aquic Hapludult; fine-loamy, mixed, mesic

Soil: Mattapex taxadjunct^{1/}

Soil No.: S57NJ-12-4

Location: Middlesex County, New Jersey. J. Wikoff farm, 1 mile east of Plainsboro, 50 feet west from west edge of woods along power line 500 feet northeast of road in cultivated field.

Vegetation and land use: Cultivated (winter wheat cover crop turned under for potatoes).

Slope and land form: About 1 percent.

Erosion: Not believed either accumulation or deposition.

Drainage: Moderately well drained.

Permeability: Moderate.

Parent material: Silty mantle overlying gravelly and sandy, cross-bedded deposits.

Sampled by and date: G. A. Quakenbush, E. J. Pedersen, S. E. Davidson, and K. P. Wilson. March 28, 1957.

Horizon and

Beltsville

Lab. No.

- Ap
57472 0 to 13 inches. Brown (10YR 4/3) silt loam; weak coarse crumb structure; friable; mainly very fine silica silt and fine sand plus organic matter; 2 percent 1/2 to 1 inch quartz pebbles; pH 0 to 2 = 5.6, 2 to 6 = 5.4, and 6 to 11 = 5.7; irregular lower boundary. 10 to 14 inches thick.
- B21t
57473 13 to 18 inches. Strong brown (7.5YR 5/6) loam; very faint, fine, common yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm to slightly firm; discontinuous clay films on most ped surfaces, pores clay coated, clay coats around pebbles; some organic spots; 2 percent 1/2 to 1 inch quartz pebbles; scattered fine roots; pH 5.5; clear wavy boundary. 3 to 6 inches thick.
- B22t
57474 18 to 26 inches. Yellowish brown (10YR 5/8) silt loam, common fine faint yellowish brown (10YR 5/6) mottles and few spots of dusky red (2.5YR 3/2); moderate medium subangular blocky structure parting to fine subangular blocks; slightly firm to firm; continuous clay films on most surfaces; many very fine pores; common fine white mica, oriented parallel to ped faces; occasional decayed chert or feldspar grains and fine fragments; 2 percent 1/2 to 1 inch quartz pebbles; pH 5.3; clear wavy boundary. 7 to 10 inches thick.
- IIB3
57475 26 to 31 inches. Yellowish brown (10YR 5/6) loam; few fine faint mottles; weak medium subangular blocky structure; firm in place, friable when removed; distinct discontinuous clay films on many ped faces and bridging grains; all grains coated with clay; many fine pores; scattered fine white mica; some decayed chert or feldspar; few roots; 12 percent 1/4 to 1 inch quartz pebbles; pH 4.1; clear broken boundary. 0 to 7 inches thick.
- IIIC1
57476 31 to 38 inches. Strong brown (7.5YR 5/6) sandy loam with few fine or medium distinct dark or reddish zones that may be mottles; massive; pebbles clay coated; sand grains bridged with clay; firm or very firm in place, friable when removed; few fine roots; 3 to 5 percent dark minerals, some chert; iron, manganese and clay cementation; many 0.1 to 1.0 mm pores; very few fine white mica flakes; 12 percent 1 to 2 inch quartz pebbles; pH 4.9; gradual wavy boundary. 3 to 10 inches thick.
- IIIC2
57477 38 to 50 inches. Strong brown (7.5YR 5/6) to yellowish red (5YR 5/6) gravelly sandy loam; massive; friable; coarse, medium and fine sand, well rounded, frosted and coated with oxides and clay; many uncoated pores; some moderately shiny, altered ferromagnesian minerals; many decayed cherts of all sizes; some, more angular quartz grains; some manganese cementation; some reddish zones around cherts and ferromagnesian grains; occasional feldspars altered to white clay specks; very little mica; 25 percent coarse skeleton 1/8 to 1 inch diameter, mainly quartz pebbles; pH 4.5.

Notes: Colors refer to moist soil.

^{1/}This pedon is a taxadjunct because it is in the fine-loamy family particle size class, whereas the Mattapex series is in the fine-silty. Base saturation is marginal toward Alfisols because of long term agricultural liming and fertilization, and is extrapolated as very near 35 percent at 63 inches.

FEDON CLASSIFICATION: Aquic Hapludult; fine-loamy, mixed, mesic
SOIL Mattapex taxadjunct SOIL Nos. 856A-12-2

LOCATION Middlesex County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59263 - 59268

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments				
		Total			Sand				Silt					2A2 > 2 < 76 Pet.	2-19 Pet.	19-76 Pet.		
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)	
0-10	Ap	31.6	55.5	12.9	2.2	6.6	7.1	8.3	7.4	27.2	28.3	38.7	24.2	0.97	5			
10-13	B21t	21.5	58.4	20.1	1.7	3.9	4.5	5.5	5.9	24.9	33.5	33.6	15.6	0.95	9			
13-20	B22t	24.7	51.7	23.6	2.2	4.3	5.2	6.6	6.4	23.2	28.5	33.1	18.3	0.92	14			
20-24	B23t	28.2	54.9	16.9	1.6	3.6	5.1	8.3	9.6	28.2	26.7	42.6	18.6	0.94	9			
24-31	B24t	24.9	58.6	16.5	1.2	3.1	4.1	7.0	9.5	28.9	29.7	42.2	15.4	0.97	4			
31-39	TTC1	75.0	20.9	4.1	4.0	10.5	16.7	27.5	16.3	13.1	7.8	44.1	58.7	0.81	26			
Analysis by New Jersey Agr. Exp. Sta., Rutgers University B/																		
Depth (in.)	6A1e Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. Iron as Fe Pct.	Water retained at suction of								6D3 Avail- able water in/in	Field capa- city Pct.	6C1c (1:1) KCl	6C1e (1:1) H ₂ O	pH	
					Bulk density g/cc	Pct.												
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar						15 bar
0-10	1.02			1.1	1.41	24.0	21.4	20.1	19.0	17.6	11.8	8.0	5.6	0.20	19.5		4.8	
10-13	0.17			1.5	1.54	22.3	21.4	20.8	20.2	19.4	14.2	10.2	7.4	0.20	19.5		4.8	
13-20	0.28			1.9	1.51	23.1	22.1	21.5	20.9	20.5	15.5	12.1	9.7	0.18	20.3		4.8	
20-24	0.08			2.0	1.69	20.4	19.6	18.0	18.0	17.0	13.2	9.7	8.0	0.22	20.6		4.7	
24-31	0.07			1.8	1.65	20.9	20.1	19.5	19.0	18.2	14.1	9.9	8.1	0.21	20.9		4.6	
31-39	0.02			1.2	1.78	12.9	9.4	8.4	7.4	6.7	3.8	2.7	2.3	0.18	12.0		4.6	
Extractable bases 5B1a																		
Depth (in.)	6N2d					6H2a Ext. acidity	6C2c CEC		6G1d Ext. Al	Ratios to clay 5D1			6D3 Ca/Mg	Base saturation				
	Ca	Mg	Na	K	Sum		SA3a Sum cations	Ext. Al		CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.			
	mg/100 g																	
0-10	2.2	0.5	0.1	0.4	3.2	9.8	13.0			1.01	0.09	0.43		25				
10-13	1.9	0.7	0.1	0.3	3.0	8.0	11.0			0.55	0.07	0.37		27				
13-20	2.9	0.8	0.2	0.4	4.3	8.4	12.7			0.54	0.08	0.41		34				
20-24	2.8	0.4	0.1	0.2	3.5	6.7	10.2			0.60	0.12	0.47		34				
24-31	2.6	0.3	0.1	0.1	3.1	6.3	9.7			0.59	0.11	0.49		35				
31-39	1.0	0.1	0.1	0.1	1.3	2.9	4.2			1.02	0.29	0.56		31				
Clay Fraction Analysis 7A1b-d																		
Depth (in.)	Mt.	Chl.	Vm.	M.	Int.	Qtz.	Kl.	Gibbsite	Analysis by New Jersey Agr. Exp. Sta., Rutgers									
									Hydrau- lic conduct- ivity in/hr	Porosity B/		Plastic index	Aggre- gate stabil- ity Pct.					
										Non- capil- lary Pct.	Capil- lary Pct.			Total Pct.				
0-10									0.4	12.6	28.6	41.2	45					
10-13									0.3	8.7	32.8	41.5	24					
13-20									0.3	7.6	33.3	40.9	22					
20-24									0.01	4.0	33.0	37.0	8					
24-31									0.02	4.2	33.0	37.2	6					
31-39									2.1	12.1	17.2	29.3	25					

Methods refer-
enced on
methods code
sheet.

Pedon Classification: Aquic Hapludult; fine-loamy, mixed, mesic

Soil: Mattapex taxadjunct ^{1/}

Soil No.: S58NJ-12-2

Location: Middlesex County, New Jersey. 1 mile east of Plainsboro, south of Plainsboro-Cranbury Road, west of crossing of high tension line distance of 13 utility poles, in field about 225 feet; Britton farm.

Vegetation and land use: Cropped for potatoes for over 15 years and then, the last 6 years, for potatoes alternating with wheat. Wheat stubble plowed under during past autumn.

Slope and land form: 1 percent.

Drainage: Moderately well drained.

Permeability: Moderately slow.

Parent material: Silty and very fine sandy materials on broad, upland, very gently sloping sections of the coastal plain.

Described by: G. Quakenbush

Horizon and

Beltsville

Lab. No.

Ap 59263	0 to 10 inches. Dark brown (10YR 4/3) silt loam; massive breaking to weak fine granular structure friable; abrupt smooth boundary. 8 to 10 inches thick.
B21t 59264	10 to 13 inches. Strong brown (7.5YR 4/6) silt loam; weak thin to medium platy structure, also vertical irregular jointing of undetermined spacing; friable; concentration of fine roots in joints; clay films on peds; clear wavy boundary. 7 to 13 inches thick.
B22t 59265	13 to 20 inches. Strong brown (7.5YR 4/6) silt loam; weak or moderate medium or coarse subangular blocky structure; friable, slightly sticky; clay films are weak; clear wavy boundary. 7 to 13 inches thick.
B23t 59266	20 to 24 inches. Strong brown (7.5YR 4/6) silt loam; few to common fine faint mottles; massive breaking to weak coarse subangular blocks; firm in place; slight clay films; clear wavy boundary. 4 to 10 inches thick.
B24t 59267	24 to 31 inches. Strong brown (7.5YR 5/6) silt loam; common or many distinct light brownish gray (10YR 6/2) matter; weak coarse subangular blocky structure; firm in place, friable removed; sand constituent is fine or very fine; clear wavy boundary. 6 to 8 inches thick.
IIIC1	31 to 30 inches. Dark brown (7.5YR 4/4) gravelly loamy sand; weakly stratified. Five to

Not sampled

Notes: Colors refer to moist soil.

^{1/}This pedon is a taxadjunct because its family particle size class is fine-loamy, as opposed to fine-silty for the Mattapex series.

PEDON CLASSIFICATION: Arenic Hapludult; loamy, siliceous, mesic

SOIL Westphalia taxadjunct

SOIL Nos. 859NJ-8-1

LOCATION Gloucester County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60143 - 60147

Depth (in.)	Horizon	181b Size class and particle diameter (mm) 3A1											3B2 Cm	3B1 Coarse fragments			
		Total			Sand				Silt					2A2 ≥ 2 < 76 Pct.	2-19	19-76 Pct. of < 76mm	
		Sand (2-0.05)	Silt (0.05- 0.002)	Clay (≤ 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02- 0.002)	Int. II (0.2-0.02)					(2-0.1)
0-4	A1	89.8	7.8	2.4	2.1	7.9	4.1	37.0	38.7	4.3	3.5	77.4	51.1	1.00	1		
4-17	A21	87.9	7.9	4.2	2.2	6.9	3.6	37.7	37.5	3.9	4.0	76.8	50.4	0.97	7		
17-26	A22	84.2	13.2	2.6	1.8	4.4	2.2	38.7	37.1	10.2	3.0	83.8	47.1	0.92	13		
26-36	Bt	79.4	5.9	14.7	0.8	1.8	1.1	41.0	34.7	2.5	3.4	76.1	44.7	0.97	5		
36-60	C	84.4	5.0	10.6	0	0.2	0.2	30.4	53.6	2.6	2.4	85.8	30.8	1.00	tr.		

Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	Carbonate as CaCO ₃ Pct.	Bulk density g/cc	Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/								Available water in/in	Field capa- city Pct.	pH	
						Water retained at suctions of										8C1c (1:1) KCl	8C1a (1:1) H ₂ O
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar				
0-4	1.34	0.045	30		1.12	39.7	24.9	21.6	18.2	16.9	4.7	4.2	4.0	0.12	15.0		3.6
4-17	0.37	0.025	15		1.27	33.4	25.3	21.4	9.8	7.8	4.3	3.4	2.5	0.12	11.9		4.4
17-26	0.08				1.47	23.9	17.8	14.2	7.7	4.9	2.8	2.1	1.4	0.16	12.2		4.5
26-36	0.12				1.55	21.8	17.7	14.3	12.6	8.7	9.4	8.1	6.9	0.13	15.2		4.3
36-60	0.04				1.44	26.4	19.3	15.6	9.3	3.0	7.2	6.3	5.5	0.07	10.7		4.3

Depth (in.)	Extractable bases 5B1a					6H2a Ext acidity	CEC 5A3a Sum cations	6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation	
	6N2d Ca	6O2b Mg	6P2a Na	6Q2a K	Sum				CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.
	meq/100 g													
0-4	0.1	tr.	tr.	tr.	0.1	4.1	4.2						2	
4-17	tr.	tr.	tr.	tr.	tr.	3.3	3.3			0.78		0.60	-	
17-26	tr.	tr.	tr.	tr.	tr.	0.8	0.8						-	
26-36	tr.	tr.	tr.	tr.	tr.	3.9	4.0			0.27		0.47	2	
36-60	tr.	tr.	tr.	tr.	tr.	2.1	2.1			0.20		0.52	-	

Depth (in.)	Clay Fraction Analysis 7A1b-d								Analyses by New Jersey Agr. Exp. Sta., Rutgers 8/					Methods refer- enced on methods code sheet.
	Mt.	Chl.	Vm.	Mi.	Int.	Qtz.	Kl.	Gibbsite	Hydrau- lic conduc- tivity in/hr	Porosity 8/			Aggre- gate stabil- ity Pct.	
										Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.		
0-4									4.2	24.2	27.6	51.8	87	
4-17									5.9	15.0	32.8	47.8	84	
17-26									2.2	12.4	25.8	38.2	53	
26-36									0.3	9.0	27.3	36.3	14	
36-60									2.8	11.2	27.5	38.7	13	

Pedon Classification: Arenic Hapludult; loamy, siliceous, mesic

Soil: Westphalia taxadjunct ^{1/}

Soil No.: S59NJ-8-1

Location: Gloucester County, New Jersey. About 200 feet south of the Barnsboro-Jefferson Road, 10 feet west of woods trail; long.: 75°10'45", lat.: 39°45'20"; on property of Lawrence Meyers.

Vegetation and land use: Hardwood forest of yellow poplar and beech abundant and white and red oak common; some black gum, red maple, sassafras. Shrubs: sweet pepper bush, laurel, wild honeysuckle.

Slope and land form: 2 percent.

Drainage: Moderately well drained.

Permeability: Moderate.

Parent material: Kirkwood formation, fine sand.

Horizon and
Beltsville
Lab. No.

O1 6 to 3 inches. Loose leaves of beech, red oak.
Not sampled

O2 3 inches to 0. Very dark gray (10YR 3/1) fibrous matted broken leaves.
Not sampled

A1 0 to 4 inches. Dark gray (10YR 4/1) fine sand; single grain; loose; less than 2 percent
60143 rounded quartzose pebbles; abrupt wavy boundary. 2 to 5 inches thick.

A21 4 to 17 inches. Yellowish brown (10YR 5/6) fine sand; weak medium subangular blocky structure;
60144 very friable; many roots; gradual smooth boundary. 14 to 16 inches thick.

A22 17 to 26 inches. Light yellowish brown (2.5Y 6/4) loamy fine sand; weak medium subangular
60145 blocky to weak platy structure; very friable; 10 percent of quartzose pebbles and cobbles, some up to 5 and 8 inches in diameter; gradual wavy boundary. 5 to 10 inches thick.

Bt 26 to 36 inches. Yellowish brown (10YR 5/8) very fine sandy loam; moderate medium subangular
60146 blocky structure; friable; common roots; some pebbles; thin clay films around pebbles; very wavy. 12 to 24 inches thick.

C 36 to 60 inches. Yellowish brown (10YR 5/8) loamy very fine sand with streaks of (10YR 6/2) up
60147 to 2 inches in thickness; single grain; very friable; few roots; less than 3 percent pebbles.

Notes: Colors refer to moist soil.

^{1/}This pedon is a taxadjunct because the epipedon and the argillic horizon is thicker than in the Westphalia series which is in the Ochreptic subgroup.

PEDON CLASSIFICATION: Arenic Hapludult; loamy, siliceous, mesic
SOIL ~~Westphalia taxadjunct~~ SOIL Nos. ~~598J-3-2~~

LOCATION Burlington County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 60132 - 60137

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) SAI											3B2 Cm	Coarse fragments 3B1					
		Total				Sand				Silt				2A2 ≥ 2	2-19	19-76			
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (= 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)					(2-0.1)	Pct.	Pct. of ← 76mm →
0-5	A1	78.9	19.6	1.5	2.5	9.0	7.9	27.2	32.3	12.1	7.5	63.6	46.6	1.00	tr.				
5-23	A2	75.6	19.5	4.9	3.1	9.2	7.8	24.9	30.6	12.2	7.3	60.1	45.0	1.00	tr.				
23-31	B2t	69.3	21.1	9.6	3.0	6.9	6.2	21.5	31.7	13.2	7.9	59.9	37.6	1.00	tr.				
31-39	B3t	79.0	13.5	7.5	3.6	8.8	7.9	27.3	31.4	9.0	4.5	59.7	47.6	1.00	tr.				
39-46	C1	94.6	3.9	1.5	4.0	14.9	12.1	38.7	24.9	3.2	0.7	54.0	69.7	1.00	tr.				
46-50	C2	87.4	5.4	7.2	2.7	14.0	11.6	34.7	24.4	4.5	0.9	51.1	63.0	1.00	tr.				
Analyses by New Jersey Agr. Exp. Sta., Rutgers University 8/																			
Depth (in.)	6A1a Organic carbon	5B2a Nitrogen	C/N	Carbonate as CaCO ₃	Bulk density	Water retained at suction of										Available water	Field capa- city	pH	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar	in/in	Pct.			8C1c (1:1) KCl	8C1a (1:1) H ₂ O
0-5	1.16	0.049	24		1.11	44.1	28.4	26.3	22.4	19.2	3.8	3.5	3.4	0.15	16.8		3.6		
5-23	0.46	0.032	14		1.30	35.9	23.9	22.8	17.2	15.0	4.4	3.7	3.1	0.14	13.7		4.5		
23-31	0.13				1.56	17.7	17.0	14.5	12.0	9.4	6.1	5.2	4.5	0.15	14.0		4.3		
31-39	0.06				1.58	15.1	14.5	13.0	10.6	9.1	4.5	3.9	3.1	0.13	11.1		4.3		
39-46	0.00				1.56	21.7	12.2	10.1	6.8	4.6	2.0	1.2	0.8	0.12	8.8		4.4		
46-50	0.04				1.61	21.3	14.3	12.4	9.4	8.0	4.4	4.1	3.1	0.13	11.5		4.3		
Depth	Extractable bases 5B1a				6H2a Ext.	CEC		6B1d Fst	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation						
	6N2d	6O2b	6P2a	6Q2a		5A3a			CEC	Fst	1:5 bar		5C3	5C1					

Pedon Classification: Arenic Hapludult; loamy, siliceous, mesic

Soil: Westphalia taxadjunct 1

Soil No.: S59NJ-3-2

Location: Burlington County, New Jersey. 200 feet north of Buddtown-Palales Road, near Reayville

Pedon Classification: Humic Hapludult; coarse-loamy, siliceous, mesic
 Soil: Downer taxadjunct ¹/₂
 Soil No.: S58NJ-5-4
 Location: Cape May County, New Jersey. 3/4 mile north of canal, on west side of Shunpike Road, 250 yards west of road, toward projection of woods; Phillips farm.
 Vegetation and land use: Under alfalfa of several years.
 Slope and land form: 2 to 3 percent.
 Drainage: Well drained.
 Permeability: Moderately rapid.
 Parent material: Quaternary coastal plain sediments.

Horizon and
 Beltsville
 Lab. No.

Ap 59283	0 to 9 inches. Very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; abrupt slightly wavy boundary except for stringers that extend irregularly and as much as 5 inches into the A2.
A2 59284	9 to 12 inches. Yellowish brown (10YR 5/4) sandy loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; clear wavy boundary. 3 to 7 inches thick.
E1 59285	12 to 16 inches. Dark brown (10YR 5/3) sandy loam, pale brown (10YR 6/3) dry; massive, crushing to very weak very fine granules; clear wavy boundary. 3 to 5 inches thick.
B2t 59286	16 to 22 inches. Strong brown (7.5YR 5/6) sandy loam, light yellowish brown (10YR 6/4) dry; very weak medium or coarse subangular blocky structure; slightly plastic; thin clay films on peds and around pebbles; clear wavy boundary. 6 to 7 inches thick.
B3 59287	22 to 27 inches. Strong brown (7.5YR 5/6) sandy loam, yellowish brown (10YR 5/4) dry; massive; friable; clear wavy boundary. 3 to 5 inches thick.
IIC 59288	27 to 36 inches. Yellowish brown (10YR 5/6) sand, light yellowish brown (10YR 6/4) dry; single grain; loose.

Notes: Colors are for moist soil unless indicated otherwise.

¹/₂ This pedon is a taxadjunct because it has the dark Ap horizon of the Humic subgroup. The Downer series is in the typic subgroup. Base status is elevated by fertilization and liming is considered less than 35 percent below 60 inches.

PEDON CLASSIFICATION: Psammentic hapludult; sandy, siliceous, mesic

SOIL Galestown loamy sand SOIL Nos. S58NJ-3-1 LOCATION Burlington County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59201 - 59205

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											3B2 Cm	Coarse fragments 3B1							
		1B1b Total			Sand					Silt				2A2 > 2 Pct.	2-19 Pct.	19-76 Pct. of < 76mm					
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Silt (0.02-0.002)	Int. III (0.2-0.02)					Int. II (2-0.1)				
0-4	A11,A12	87.6	8.4	4.0	0.8	10.8	29.8	38.8	7.4	4.9	3.5	30.0	80.2	1.00	-	-					
4-26	A2	90.7	5.9	3.4	0.6	9.4	28.2	41.9	10.6	3.9	2.0	35.3	80.1	1.00	-	-					
26-32	B1t	88.1	6.3	5.6	0.5	6.6	24.7	43.7	12.6	4.2	2.1	39.6	75.5	1.00	tr.	-					
32-40	B2t	87.6	4.9	7.5	0.4	6.1	24.7	44.0	12.4	3.8	1.1	38.4	75.2	1.00	-	-					
40-62	IIC1	95.7	1.6	2.7	0.4	6.8	31.5	49.5	7.5	0.4	1.2	30.4	88.2	1.00	-	-					
62-70	IIC2	Not sampled																			
Analyses by New Jersey Agr. Exp. Sta., Rutgers University B/																					
Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. iron as Fe Pct.	Water retained at suction of								Available water in/in	Field capa- city Pct.	pH						
					Bulk density g/cc	0.02 bar									1 bar	2 bar	6 bar	15 bar	8C1c (1:1) KCl	8C1a (1:1) H ₂ O	
						0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar									
0-4	2.06	0.085	24	0.4	1.31	31.0	15.1	12.5	11.0	9.1	6.7	5.5	5.0	0.20	20.0		3.7				
4-26	0.26	0.019	14	0.4	1.47	24.8	9.5	7.3	6.1	4.9	2.8	2.2	1.3	0.10	8.4		4.3				
26-32	0.10	0.032		0.6	1.53	24.5	10.7	9.1	6.9	6.2	3.4	3.0	2.1	0.11	9.6		4.2				
32-40	0.12	0.032		0.7	1.51	24.8	10.0	8.5	7.5	6.8	3.9	3.4	2.6	0.11	9.9		4.1				
40-62	0.05			0.4	1.49	23.3	7.2	5.9	5.0	4.3	2.1	1.8	1.4	0.09	7.5		4.5				
62-70	Not sampled																				
Extractable bases 5B1a																					
Depth (in.)	6N2d					6H2a Ext. acidity	CEC		6G1d Ext Al	Ratios to clay 8D1			8D3 Ca/Mg	Base saturation							
	Ca	Mg	Na	K	Sum		5A3a Sum cations	Ext Al		CEC Sum	Ext. iron	15-bar water		5C3 Sum cations Pct.	5C1 NH ₄ OAc Pct.						
	meq/100 g																				
0-4	0.3	0.2	0.1	0.1	0.7	9.8	10.5				2.62	0.10	1.25								
4-26	0.1	0.2	0.1	0.1	0.5	2.2	2.7				0.79	0.12	0.38		7						
26-32	0.3	tr.	tr.	0.1	0.4	2.2	2.6				0.46	0.11	0.38		18						
32-40	0.3	0.2	tr.	0.1	0.6	3.6	4.2				0.56	0.09	0.35		15						
40-62	0.4	0.1	tr.	0.1	0.6	1.5	3.1					0.15	0.52		14						
62-70	Not sampled																				
Clay Fraction Analysis 7A1b-d																					
Depth (in.)	Mt.	Chl.	Vm	Mi.	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers a/												
									Porosity b/					Aggre- gate stabil- ity Pct.							
									Hydrau- lic conduc- tivity in/hr	Non- capil- lary Pct.	Capil- lary Pct.	Total Pct.	Plastic index Pct.								
0-4									11.1	26.7	19.7	46.4	N.P.	70							
4-26									8.2	27.5	14.0	41.5	N.P.	72							
26-32									5.7	25.9	16.3	42.2	N.P.	51							
32-40									5.7	26.6	15.2	41.8	N.P.	18							
40-62									10.3	26.5	11.3	37.8	N.P.	-							
62-70	Not sampled																				

Methods refer-
enced on
methods code
sheet.

Classification: Psammentic Hapludult; sandy, siliceous, mesic

Galestown loamy sand

.: S58NJ-3-1

Location: Burlington County, New Jersey. 1/2 mile west of U.S. Highway No. 130, 300 feet south in

lot, 1 mile southeast of Taylor.

Vegetation and land use: Woodland, mainly chestnut oak with some Virginia pine, hickory, beech, and red

oak. Understory: flowering dogwood.

Soil land form: 2 to 3 percent.

Drainage: Somewhat excessively drained.

Permeability: Estimated to be very rapid.

Parent material: Impure sands from high stream terrace.

Prepared by and date: N. A. Willits, K. P. Wilson, and M. A. Hawkins. April 1, 1958.

and
file

Loose leaves from last fall; very discontinuous cover.

pled

1 inch to 0. Black (5YR 2/1) matted and decayed leaves; fine rootlets and mycelia.

pled

0 to 1 inch. Black (5YR 2/1) sand; very weak fine granular structure; loose; pH 2 to 6; clear smooth lower boundary.

1 to 4 inches. Dark brown (7.5YR 3/2) sand; very weak fine granular structure or single grain; loose; pH 2.6; gradual wavy boundary. 2 to 4 inches thick.

4 to 26 inches. Yellowish brown (10YR 5/6) sand; single grain; loose; pH 4.4; clear lower wavy boundary. 20 to 23 inches thick.

26 to 32 inches. Dark brown (7.5YR 4/4) sand slightly finer textured than the A2; single grain; slightly firm in place, loose when removed; lamellae of clay accumulation; pH 4.4; clear wavy lower boundary. 4 to 11 inches thick.

32 to 40 inches. Dark brown to reddish brown (7.5YR 4/4 to 5YR 4/4) loamy sand very slightly finer textured than the B1; slightly firm in place, very friable when removed; no clay bridges; pH 4.2; clear wavy boundary. 9 to 11 inches thick.

40 to 62 inches. Dark brown (7.5YR 4/4) sand, balls and lamellae of heavy loamy sand; single grain; very friable; pH 4.3; clear wavy lower boundary.

62 to 70 inches. Dark yellowish brown (10YR 4/4) to yellowish brown (10YR 5/4) medium sand; single grain; loose.

pled

follows refer to moist soil

PEDON CLASSIFICATION: Psammentic Hapludult; sandy, siliceous, mesic
SOIL Galestown loamy sand SOIL No. 858M-3-2 LOCATION Burlington County, New Jersey

SOIL SURVEY LABORATORY Beltsville, Maryland

LAB. Nos. 59206 - 59210

Depth (in.)	Horizon	1B1b Size class and particle diameter (mm) SA1													3B2 Cm	Coarse fragm	
		Total				Sand				Silt						2A2 % 2	2-19 ← P ← A
		Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	Pct.			
Pct. of ≤ 2 mm																	
0-5	A11, A12	89.3	7.1	3.6	1.3	16.4	25.5	36.5	9.6	4.6	2.5	34.2	79.7	1.00	-		
5-27	A2	93.3	3.2	3.5	1.7	13.2	23.9	41.2	13.3	3.0	0.2	40.0	80.0	1.00	tr.		
27-36	B1t	89.8	3.3	6.9	1.3	8.0	18.4	45.6	16.5	2.8	0.5	47.2	73.3	1.00	tr.		
36-48	B2t	90.1	2.5	7.4	2.2	12.0	23.1	41.3	11.5	1.5	1.0	36.6	78.6	1.00	tr.		
48-60	C	91.2	4.3	4.5	1.9	9.9	17.2	31.5	30.7	3.2	1.1	55.2	60.5	1.00	tr.		
Analyses by New Jersey Agr. Exp. Sta., Rutgers University B/																	
Depth (in.)	6A1a Organic carbon Pct.	6B2a Nitrogen Pct.	C/N	6C1a Ext. Iron as Fe Pct.	Bulk density g/cc	Water retained at suctions of								Available water in/in	Field capacity Pct.	pH 8C1c (1:1) 8C1 KCl	
						0.02 bar	0.06 bar	0.10 bar	0.33 bar	1 bar	2 bar	6 bar	15 bar				
						Pct.											
0-5	2.31	0.105	22	0.5	1.30	31.5	15.5	13.3	11.2	10.0	7.3	6.6	6.3	0.093	13.6		
5-27	0.15	0.034		0.5	1.47	23.7	9.5	6.9	5.3	3.8	2.3	2.0	1.4	0.101	8.3		
27-36	0.10	0.033		0.6	1.48	24.3	11.3	8.1	6.6	5.9	3.5	3.1	2.7	0.095	9.1		
36-48	0.09			0.8	1.53	21.7	10.7	8.2	6.9	6.2	4.3	4.0	3.3	0.101	9.9		
48-60	0.06			0.5	1.49	23.2	12.2	9.4	7.8	6.9	3.0	2.7	2.2	0.088	8.1		
Extractable bases 5B1a																	
Depth (in.)	6N2d				6H2a Ext. acidity	CEC		6G1d Ext. Al	Ratios to clay 8D1			8D3 Ca/Mg	Base sat. 5C3 Sum cations Pct.				
	Ca	Mg	Na	K		Sum	5A3a Sum cations		CEC Sum	Ext. iron	15-bar water						
	mg/100 g																
0-5	0.4	0.3	tr.	0.1	0.8	9.1	9.9		2.75	0.14	1.75		8				
5-27	tr.	0.2	tr.	0.1	0.3	2.8	3.1		0.88	0.14	0.40		10				
27-36	0.2	0.3	tr.	0.1	0.6	3.0	3.6		0.52	0.09	0.39		17				
36-48	0.2	0.3	tr.	0.2	0.7	4.9	5.6		0.76	0.11	0.45		12				
48-60	0.3	0.4	tr.	0.1	0.8	2.2	3.0		0.67	0.11	0.49		27				
Clay Fraction Analysis 7A1b-d																	
Depth (in.)	Mt	Chl.	Vm.	Ml.	Int.	Qtz.	Kl.	Gibbsite	Analyses by New Jersey Agr. Exp. Sta., Rutgers B/				Aggregate stability Pot.				
									Porosity a/								
									Hydraulic conductivity in/hr	Non-capillary Pot.	Capillary Pot.	Total Pot.		Plastic index Pot.			
0-5									9.8	26.0	20.0	46.0	N.P.	77			
5-27									10.5	27.0	13.9	40.9	N.P.	-			
27-36									6.8	24.3	16.7	41.0	N.P.	59			
36-48									7.5	21.7	16.3	38.0	N.P.	24			
48-60									3.7	18.7	18.1	36.8	N.P.	17			

Methods enclosed o. methods sheet.

Classification: Psammentic Hapludult; sandy, siliceous, mesic

Galestown loamy sand

S.: S58NJ-3-2

Location: Burlington County, New Jersey. 3/4 mile north of U.S. Highway No. 130 and north of Holliday

road, 1 mile south of Beverly, 100 feet in woodlot west of blacktop road.

Vegetation and land use: Woodland, trees averaging 2 to 4 inches in diameter, white oak, hickory, red oak, hickory, red oak, hickory, flowering dogwood, sassafras, Virginia pine, and wild cherry.

Soil and land form: Less than 1 percent.

Parent material: Little or none.

Drainage: Somewhat excessively drained.

Permeability: Estimated, very rapid throughout.

Origin: Impure sands from high, stream terrace.

Field notes by and date: N. A. Willits, K. P. Wilson, M. A. Hawkins. April 1, 1958.

A and
B
C.

3 inches to 1. Loose leaves from last fall, mainly oak.

Sampled

1 inch to D. Black (5YR 2/1) matted decayed leaves, hardly recognizable; many very fine roots and mycelia; abrupt lower boundary; pH 4.0. 1/2 to 1 inch thick.

0 to 1 inch. Very dark gray to very dark grayish brown (10YR 3/1 to 3/2) sand; single grain; loose; clear clean quartz grains throughout; pH 3.7; clear wavy boundary. 1 to 1-1/2 inches thick.

1 to 5 inches. Dark brown (7.5YR 3/2) sand; single grain; loose; fewer clean quartz grains than in A1; clear wavy boundary.

5 to 27 inches. Strong brown (7.5YR 5/6) to brown (7.5YR 5/4) sand; single grain; loose; pH 4.2; clear wavy boundary. 22 to 27 inches thick.

27 to 36 inches. Dark yellowish brown (10YR 4/4) sand with slightly more fines than A2; weak medium subangular blocky structure; slightly firmer in place than the A2, loose when removed; pH 4.2; clear wavy boundary. 9 to 14 inches thick.

36 to 48 inches. Reddish brown to yellowish red (5YR 4/4 to 4/6) sand with slightly more fines than in the B1; weak medium subangular blocky structure; slightly firm in place, very friable when removed; scattered grains of glauconite; clay bridges in the firmer spots and in lamellae; pH 3.6; clear wavy boundary.

48 to 60 inches. Reddish brown (2.5YR 5/4) sand; single grain; loose; discontinuous lamellae with slightly more clay than the mass and yellowish red (5YR 4/6); pH 4.8, some glauconite clearly visible (2 to 5 percent estimated).

: Colors refer to moist soil.

NEW JERSEY

